The Development of A Mobile Application Prototype Tour Taman Mini Indonesia Indah

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Abstract: The development of information technology has a direct impact on the improvement of the mobile phone industry, resulting in increased production and use of smartphones as a medium of information exchange. This development also creates an evolution in the world of mobile services. Android is one of the operating systems on mobile phones that provides an open platform for developers to build applications on various mobile devices. This research aims to build an Android-based mobile application that provides information on tourist attractions in Taman Mini Indonesia Indah. in real time and apply location-based services to the application. This TMII travel guide mobile application was created using Android Studio as an Integrated Development Environment (IDE), Google Maps API, and SQLite and MySql. The programming languages used are java, xml, sql, and php. The research method used is the SDLC (Software Development Life Cycle) approach with the Rapid Application Development (RAD) model.

Keywords: TMII, mobile application, Android, Google Maps API.

1. INTRODUCTION
Taman Mini Indonesia Indah (TMII) is a tourist park with the theme of Indonesian culture. An area of approximately 150 hectares or 1.5 square kilometers is located at coordinates 6 ° 18'6.8 " LS, 106 ° 53'47.2 " East Longitude. This park is a summary of the Indonesian nation's culture, covering various aspects of the daily life of the people of 26 provinces of Indonesia (in 1975) which are displayed in regional pavilions with traditional architecture, as well as displaying various clothing, dances and regional traditions. TMII holds traditional art events from regions in Indonesia such as dance performances, musical instruments, customs, and regional product exhibitions, these events are held at each platform or in other vehicles so that visitors can see the charm from the diversity of Indonesian cultures.

The development of Information Technology has an important role in the field of information and communication. In the era of globalization, the delivery of information develops in various ways, of course this is due to the development of information technology that facilitates it, such as the internet and the development of improvements in hardware specifications and capabilities to process and process information. Technological developments also occur in cell phones using technology with operating systems such as iOS, Android, BlackBerry and various other operating systems. The benefit of mobile technology for personalities is that it makes it easier to communicate not only through short messages or calls but can also transmit data in the form of audio and visuals better. Communication via mobile devices also makes it easier for people to get fast information thanks to easy internet access. 48% of internet users access it via mobile phones. Easy access and can be anywhere makes people prefer mobile devices [1]. The role of technology in the
tourism sector and the development of internet technology can be used by using a geographic information system such as the Global Positioning System (GPS) which can make it easier for tourists to access information on tourist attractions geographically. A geographic information system is a computer system that has the following four capabilities in dealing with geographically referenced data problems: (a) input, (b) output, (c) data management (storing or retrieving data), (d) data analysis and manipulation [2].

For helping tourists access information on tourist objects at TMII, a mobile-based application is needed that can provide geographic and real time information about tourist attractions. This application provides a map of tourist locations, information on rides, promo information, ticket prices, the current position of visitors, the latest information on tourist attractions and tourist attraction information.

2. LITERATURE REVIEW
2.1 THE BASIC CONCEPT OF TOURISM

Tourism can be defined as a human activity that travels to an area and lives in a destination outside their daily environment for a certain period of time for fun or business [3]. In tourism, according to Lieper [3] there are three main elements that can make tourism activities run, these elements are:

1. Tourists

Tourists are actors in tourism activities. Traveling becomes a human experience to enjoy, anticipate, and enhance times in life.

2. Geographical Elements

The movement of tourists takes place in three geographic areas as follows:

a. Tourist Origin Region (DAW)

The area where tourists come from is the place where tourists carry out their daily activities such as working, studying, sleeping and other basic needs. This routine is what motivates someone to find information about objects and tourist attractions of interest, make reservations and go to the desired destination.

b. Transit Area (DT)

Not all tourists have to stop in that area. However, all tourists will definitely pass through the area, so the role of the Transit Area (DT) is also important. It is often the case that a tour ends in a transit area, not the destination for a number of reasons.

c. Tourist Destination Area (DTW)

This area is often said to be the sharp end (spearhead) of tourism. A tourist destination (DTW) is a highly felt tourism impact that requires proper planning and management strategies. To attract tourists, DTW is a trigger for the village-wide tourism system and creates a demand for travel from the Tourist Origin Region (DAW). DTW is also the raison d’être or the main reason for the development of tourism which offers things that are different from the routine of tourists.

2.2 GEOGRAPHICAL INFORMATION SYSTEM

A Geographic Information System (GIS) is a system designed to capture, store, manipulate, analyze, organize and display all types of geographic data. The acronym GIS is used as a term for Geographical Information Science or Geospatial Information Studies which is a science related to Geographic Information Systems. It can be concluded that geographic information systems are a combination of cartography, statistical analysis and database system technology. Geographical Information Systems cannot be separated from data that refers to positions, objects and their relationships within the earth’s space, namely spatial data. Spatial data is one component of information in which there is information about the earth’s surface, below the earth’s surface, waters, oceans and under the atmosphere [4].
3. METHODODOLOGY
3.1 RESEARCH FRAMEWORK
3.1.1 ANALYSIS PHASE
To design and develop a system or application it is necessary to analyze to know the current needs and conditions and the needs of the future. Therefore, an analysis phase is carried out on the current system, problems arising from the current condition and solutions to solve existing problems. Figure 3.4

1. Problem Identification

Problem identification is carried out to define the background of the problems that underlie this research. The process of identifying problems is carried out by the method of observation with visitors at TMII.

2. Problem Formulation

The formulation of the problem contains complete and detailed questions regarding the scope of the problem to be studied based on the identification of the problem

3. System Requirements Analysis

System requirements analysis is the process of collecting, identifying, interpreting facts from existing conditions. System requirements analysis aims to understand the needs of the new system and develop a system that meets these needs or decide whether a new system development is needed or not.

3.1.2 PLANNING PHASE

The representation of the software being developed is depicted in a modeling. At this stage, the system design is carried out using conceptual modeling methods. The design stages are carried out based on the results of a defined and documented system requirements analysis. The stages of this design include: Unified Modeling Language (UML) design, system architecture design, database design and user interface design. The UML diagrams made in this study are as follows:

- Use case diagram.
- Activity diagram.
- Class diagram.

3.1.2.1 Prototype System

A. Rich Picture

Rich Picture is a model consisting of images that provide an overview of the entire system. Rich Picture proposal system can be seen in the Figure 1.

B. Use Case Diagram

The use case below describes the functionality of the TMII travel guide mobile application. Use case The proposed system diagram can be seen in Figure 2.

3.1.3 DEVELOPMENT PHASE

The development stage is the process of translating the system design into program codes in accordance with the objectives of the system requirements. Software is developed using a...
The development of a mobile programming language that refers to previously created designs. At this stage, the researcher uses Android Studio as an Integrated Development and the Android SDK which contains the libraries needed for application design. The programming language used is Java.

3.1.4 TESTING PHASE
At this phase, the application will be tested on mobile devices. Testing of development results aims to validate and verify whether the application made is in accordance with the objectives and system requirements. In the first test stage carried out by researchers. When the product has passed the first trial stage, the product will enter the field trial stage, namely testing by a team of experts.

a. Validation and Verification of Applications

System validation by a team of experts aims to test the feasibility and rationale of the system by a team of experts who are related to the research. If there are still deficiencies and differences in expectations, the identification and design stages can be carried out again.

b. System Revision

After the validation stage is carried out, revisions and reviews are carried out to ensure that the application has good functionality. This stage will review the resulting application regarding the feasibility of the application in terms of its weaknesses, strengths, constraints, and recommendations.

3.2 SOFTWARE DEVELOPMENT METHOD

The software development method used is the rapid application development model which refers to software engineering as a software development model. The author chooses the RAD (Rapid Application Diagram) approach because it considers that the application built is a simple application that requires short-term development. The following is the RAD model described by Kendall & Kendall [4].

4. RESULTS AND DISCUSSION

4.1 SYSTEM DESIGN

Design or design is the phase of making requirements specifications regarding the system architecture to be made, system appearance, and material requirements for the system to be made. The main objective of system design is to provide an overview of the system to be built or developed, and to understand the flow of information and processes that occur in the system. In system design, it includes the stages of system architecture design, unified modeling language (UML) design, interface design, and database design.

4.2 DESIGN SYSTEM ARCHITECTURE

The system architecture is made to find out how the user flow interacts with the system and get the information needed. The system to be built is an Android-based application that is run by users using a...
mobile device that supports the Android operating system.

Users communicate with the system through applications already installed on mobile devices. If the mobile device is connected to the internet, the user can make requests or send data to the server as needed through the system in the form of a request. The request is accepted by the web service which will be sent to the server, after which the server will receive the request to return a response in the form of data storage to the database on the server or respond to the web service to display data on a mobile device. If the user accesses the map feature and the user’s position feature, the application will send a request to the web service to call the coordinates of a tourist attraction from the database on the server, call the Google Maps API, and retrieve tourist coordinates via the GPS on the smartphone. The result is the location of the user’s position, the TMII map image, and objects that are owned by the map that will be displayed to the user’s device in the form of a map display that has location points that are categorized into platforms, museums, rides and facilities, flora and fauna parks, parking, toilets, food and souvenirs, and places of worship. The system architecture can be seen in Figure 5.

4.3 UNIFIED MODELING LANGUAGE (UML) DESIGN
UML aims to model a system using object-oriented concepts. UML used in this research includes use case diagrams, activity diagrams, and class diagrams.

4.3.1 USE CASE DIAGRAM DESIGN
Figure 6 below is a use case diagram in the prototype of the Android-based Taman Mini Indonesia Indah (TMII) travel guide mobile application.

4.3.2 ACTIVITY DIAGRAM DESIGN
Activity diagrams are used to describe work flow processes, business processes and the sequence of activities in a process that occurs in a system or software. Activity diagrams are a flow description of how a system starts a process, carries out a process, makes decisions that might occur, and ends the process in software. The following is an activity diagram used in the development of the Taman Mini Indonesia Indah (TMII) Tourism Guide application.

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**Figure 5. Design System Architecture.**

**Figure 6. Use Case Diagram**

**Figure 7. Position Check Activity Diagram**
4.3.3 CLASS DIAGRAM DESIGN
Class diagrams describe the application structure from defining the classes that will be created to build the application. The classes defined have attributes and methods (functions). The Class Diagram design in the application to be built consists of seven classes, namely the Main, Tour_Object, Event, Facility, Review, Map, and User classes.

4.3.4 DATABASE DESIGN
Database design includes creating database tables and relationships between tables. Database design on the system uses the Entity Relationship...
Diagram (ERD) as the basis for making database tables.

4.3.5 STRUCTURE DESIGN AND DATABASE TABLE RELATIONSHIPS

The results of the database structure design and the relationships between tables are depicted in the relationship table which can be seen in Figure 4.

4.3.6 MAIN PAGE DESIGN

4.3.7 MAIN PAGE IMPLEMENTATION
5. CONCLUSION AND FURTHER DEVELOPMENT SUGGESTION

5.1 CONCLUSION
From the results of the analysis, development and testing of the mobile application prototype for the Taman Mini Indonesia Indah (TMII) tourism guide based on Android, it can be concluded that the following are:

1. Digital maps can be built using the Google Maps API by accessing Google Play Services
2. Global Positioning System plays an important role in determining the accuracy of the user’s position
3. The Android-based mobile application developed utilizes the Google Maps API in displaying maps and MySQL databases for storing and processing data.
4. Development of a mobile application prototype for the Android-based Taman Mini Indonesia Indah (TMII) tour guide that has been made to help Taman Mini Indonesia Indah to promote and convey tourist information, information on supporting facilities, and event information available to visitors.
5. The prototype of the TMII tourist guide application can be used by tourists, both local and foreign tourists, to obtain information on TMII attractions and to the location of tourist objects by viewing tourist information and maps.

5.2 FURTHER DEVELOPMENT SUGGESTION
Suggestions that can be given for further development of this system are as follows:

1. Adding route features between tourist attractions
2. Adding security facilities so that the system is not easily hacked by unauthorized people
3. This application can be developed to be more animative by adding a sound component that provides information to the user when the user is near a tourist attraction.
4. Applications are developed in the form of different platforms such as windows phone, IOS, so that not only Android users can use the application. Further development of phonegap as an IDE that can support the platform.
5. It is necessary to develop an application from the server side in the form of a web application to manage data and provide data.

REFERENCES