SNAP PLACE RECOGNITION APPLICATION DEVELOPMENT FOR TOUR PLACE IN BANDUNG CITY LVERAGING CAMERA GEOTAG AND GEOFENCE ON ANDROID

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ABSTRACT

Abstract - Tourism nowadays has become one of the lifestyle of modern society as one of the activities to relieve boredom, it can be seen by the increasing number of trips that occurred in each year, as the sample in 2015 the Central Statistics Agency (BPS) data out around 130 057 million tourist trips occur in all parts of Indonesia, were higher when compared with the data in 2014 that only about 117 447 million. Seeing these conditions, the smartphone can be used as a guide wisata.Berdasarkan it, it can be concluded the need to build software that can help a traveler problems that were outlined earlier. The software is built to be run on a media that is easy to access and carry anywhere as a smartphone. Snap place is an application that runs on mobile devices. Plafrom digunkan is android, considering that Android currently has the most users in the world. This place snap software technology utilizes photo geofence.Berdasarkan tangging and test results can be concluded that the software enables snap place rating in knowing you are visiting tourist information

Keywords *– Tourism, Bandung, Geofence, Phototagging, Android*

1. PRELIMINARY

Current holiday already become one of the lifestyle of modern society as one of the activities to relieve boredom, it can be seen by the increasing number of trips that occurred in each year, as the sample in 2015 the Central Statistics Agency (BPS) data out approximately 130 057 million tourist trips occur in all parts of Indonesia, were higher when compared with the data in 2014 that only about 117 447 million [1]. Seeing these conditions, the smartphone can be used as a tour guide. By designing applications Snap Place, the smartphone can be used to become the integrator holiday while visiting tourist attractions. How to use this application will be made as easy as possible so that it can make the user more interested in using it. Applications to be named Snap Place will have a function to know the detail infromasi a tour that is being visited. This application is also equipped with Geotag Recognition Camera feature to identify historic objects that exist in a tourist spot to let users know more about the object.
When compared with similar applications that have been there before, for example TouristEye, TravelPlanner !, and TripIt, on the application only provides choice without any detailed information, and no Camera Geotag feature recognition.
Seeing this condition, then the role of the smartphone can be used as a tourist guide to designing applications Snap Place, the smartphone can be used to determine the most visited tourist detail information. How to use this application will be made for as easily as possible so as to make the user more interested in using it. Snap apliksi Place will be developed on android operating system because the current Android smartphone presence has dominated the market when compared to other operating systems. [2] Here is the Table I.1 Marker Smartphone

Tabel 1 Worldeide Mobile Phone

Period	Android	iOS	Windows Phone
2015Q2	82.8%	13,9%	2,6%
2014Q2	84,8%	11,6%	2,5%
2013Q2	79,8%	12,9%	3,4%
2012Q2	69,3%	16,6	3,1

Source : IDC Worldwide Mobile Phone Tracker[2]

Aplikasi yang akan diberi nama Snap Place ini akan memiliki fungsi untuk memandu parawisatawan yang sedang berlibur di kota bandung sehingga mendapatkan informasi atau deskripsi yang jelas tentang wisata yang dikunjungi tanpa menyewa tour guide,berikut ini adalah jumlah objek wisata kota bandung yang di ambil dari website dinas pariwisata kota bandung

1.1. Theoretical Basis

The theoretical basis of the description of the basic concepts and theories related to application development snap place recognition for the tourist attractions in Bandung memanfaat camera geotagging technology and geofance on Anroid. The theories involved and support this research will be discussed in this chapter

1.2. Bandung City

The city is also known by the nickname of City of Flowers is because in ancient times this city has keindahanya with many plants and types of flowers that grow in this city, in addition to the city of Bandung is also called the Paris Van Java or in other words the Paris her on the island of Java because keindahaan like city Paris in France. Currently the city of Bandung is still a tourist destination a favorite in Indonesia which is famous for shopping either clothing or food, and town is also known for its historic buildings, one of which is the building Merdeka host the Asian-African Conference held regularly every five years that Bandung is now also known as the Capital City of Asia and Africa in 2015[5]

1.3. Information

Information is data that has been processed into a form that is important for the recipient and have a real value that can be felt in the decisions that are now or decisions of great things to come, while according to Burch and Strater, information is the collection or processing of data to provide the knowledge or information [3]

1.4. Application

Application is the use of a computer, the instruction (instructiom) or a statement (statement) is structured so that the computer can process inputs into outputs [4]. According to the Dictionary of Indonesian dictionary, application is the application of a system designed to process the data using rules or provisions of a specific programming language. Application is a computer program made to do and carry out special tasks of users. Is a series of applications or commands to be executed by the computer. The program is a collection instruction set to be executed by the processor, in the form of software. How can a thinking computer system regulated by this program [4]

1.5. Android

Android is a Linux-based operating system designed for touch screen mobile devices such as smart phones and tablet computers. Android was originally developed by Android, Inc., with financial support from Google, which then bought it in 2005. The operating system was released officially in 2007, in conjunction with the establishment of the Open Handset Alliance, a consortium of companies hardware, software, and telecommunications that promotes open standards mobile devices. The first Android phone went on sale in October 2008 [5].

1.6. JSON

JSON (JavaScript Object Notation) is a lightweight data interchange format, readable and writable by humans, as well as easily translated and made (generated) by the computer. This format is based on part of the Programming Language JavaScript, Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is independent of any programming language because it uses a style that is commonly used by programmers family of C including C, C ++, C # , Java, JavaScript, Perl, Python etc. Because of these properties, making it ideal as a language exchange JSON-data. JSON is made of two structures [6]

1.7. GPS Phototagging

GPS Photo Tangging also known as geotangging, is the process of adding Opera-position GPS data (Latitude, Longtitude, Altitude) in a digital photo. Posel-camera phones that have GPS receiver intenal generally have this feature. GPS Makanisme PhotoTagging is when a photo is taken using the camera (digintal or mobile phone) that features geotangging, camera or mobile phone tesebut recorded more infromasi / data compared with a photo taken with a regular camera. Such information includes the time and data when a photo is taken, orintasi of the camera (portrait or landscape), whether using the flash and other camera details digunkan like Aperatur, Exposure, and Local Length. All data are stored in

a place called EXIF Headers [7] Data EXIF (Exchangeable Image Format) is the data stored by the digital camera to an image that contains information about the condition and setting digital Kamra at the time of the pmotretan. EXIF developed by Japanese Electronics Industry Development Association (JEIDA) as an effort to simplify and standardize the exchange of data between the image processing software / digital image and hardware such as cameras, and supported by almost all digital cameras Exifinterface class is one class in android programming can use to read and write the Exif tag information in JPEG format

1.8. Android Studio

Android Studio is an IDE for Google Android Development introduced at the Google I / O 2013 Android Studio is a development of the Eclipse IDE, and is based on the popular Java IDE, IntelliJ IDEA is. Android Studio is the official IDE for Android application development. As the development of Eclipse, Android Studio has many new features compared to Eclipse IDE. In contrast to the use of Eclipse Ant, Gradle as Android Studio using the build environment. Further features are as follows [23]

1.9. Geofence

Geofence is a virtual parameter for the geographic area in the real world. Virtual parameter set can be static or dynamic. One typical example of a dynamic geofence is a radius around the store or point locations. static geofence can be set from a predetermined limit, such as school attendance zones or environmental limits. Costume digital geofencing can also be used, if the device that provides location-based services (LBS) users enter or exit geofencing, the device will receive a notification message. This notification may contain information about the location of the device [8]

2. CONTENTS OF RESEARCH

2.1.1. Analysis and Design System

S*ystems analysis aims to identify the problems with the system and determine the needs of the system built. The analysis includes problem analysis, analysis of similar applications, system architecture analysis, analysis of non-functional requirements and data analysis.*
In building an application that suits your needs, will require an analysis of the system is running at this time or the system is running in general. The goal is for the system to be built not out of the core system which has been running now

2.1.1 Problem analysis

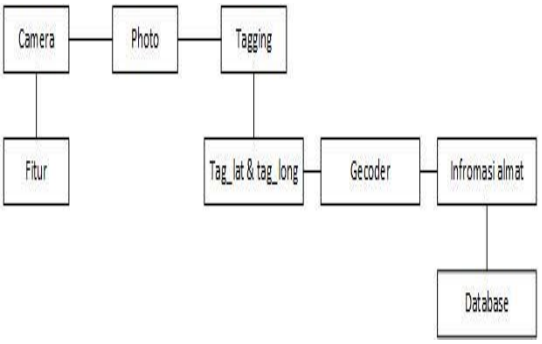
Unknown Based on the questionnaire survey respondents visitor attractions in the city agree that they often do not know the tourist information in the city due to lack of travel information

Also, based on the results of other questionnaires to travel in the city of Bandung, the result that travelers require additional online media so as to assist the tourists in getting travel infromasi .. Therefore, to meet the desired needs of the researcher is interested to build a mobile-based applications (Android) that can provide a variety of travel information that is expected to facilitate users in obtaining the information desired attraction and easier for tourists to get detailed travel information

1. *How to build applications for detecting information contained within objects*
2. *How to make an application to facilitate users in getting a description of a tour in realtime*

2.1.2 Analisis Teknologi Geotagging

These applications take advantage of geotagging technology that is embedded in the android smartphone camera, geotagging data is taken is tag_latitude and tag_longitude. These tags will be used as input data for the geocoder. Results of the geocoder is a form of address information in which the photograph. Below is a picture geotagging process of collecting data as input to the geocoder data storage to the database. Here is the Image III. 3 Mechanism Pegambilan Data Geotagging



Gambar III. 1Data retrieval mechanism Geotagging

2.1.3 Analysis Geofencing

Geofencing is a feature in the software program that uses the global positioning system

(GPS) to determine the geographic boundaries. This system determines the tracked object is located inside or outside the geofence



***Gambar III. 2** Analysis Geofencing*

Geofencing mechanism to determine the point to be in geofencingkan is to first determine the latitude and longitude that you want to give geofencing, after getting latitude and longitude, and then specify the radius that want to be included, the specified radius is within permeter

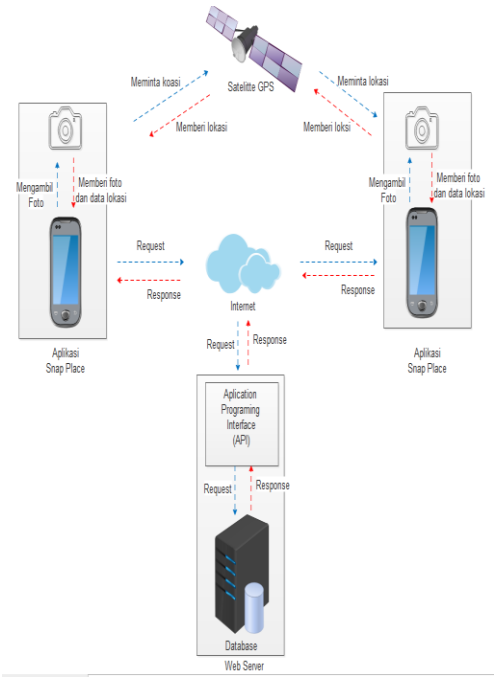
2.1.4 Analysis Features

Analysis features will explain the mechanisms and workings features mendukuang snap system performanceplace

How medeteksi pictures taken using the camera. Users will select an object to be captured using the camera, from the results obtained in the form of the camera image and the system will retrieve the latitude and longitude of the place of shooting. By using geotagging features, kemudain system will retrieve the latitude and longitude of the location shooting. Here is a script to retrieve latitude and longitude information of geotagging

2.1.5 System Architecture Analysis

Architecture Analysis System is a system that will be built, application-based Snap Place will communicate by internet web service using JSON language exchanges, while rancanganan system to be built can be seen in the following figure



Gambar III. 3 Arsitektur Perangkat Lunak

Below is a description of Software Architecture Figure 3:

1. The mobile device users to take photos from a camera
2. Camera to request location data to GPS satellite
3. mengeirim GPS location data of mobile device users
4. The mobile device user request data to the server via API
5. The server accepts requests for data from the API and then the server will retrieve the data contained in the database
6. Once the server might also accept the requested data from the database, the data will be restored and converted in the form of JSON by API
7. Data taken by a mobile system in the form of JSON for processing the user's mobile device

2.1.6 Analysis Proximity Distance

By using geotagging feature, then the system will retrieve the latitude and longitude of where the photo. Once the system gets the data latitude and longitude in which the photograph then the next step is to compare the data between the two locations is a location that will be uploaded to the location where the photo by users

2.1.7 Software Requirements Specifications

Software requirements specification requirements are divided into two non-functional requirements and functional. Functional

requirements can be seen in Table III.2 spesipikasi Functional Requirements

Kode SKPL	Spesifikasi Kebutuhan Perangkat Lunak
SKPL-F-001	*Mobile system provides a facility for users to download the images into the system*
SKPL-F-002	*Mobile System Provides a facility for users to download the images into the system*
SKPL-F-003	*Mobile system provides a facility for the user to see a description or history of the location that has been taken using the camera*
SKPL-F-004	*Mobile system provides a facility for users to upload pictures into the system*
SKPL-F-005	*Mobile system provides a facility for users to search locations*

2.1.8 Non-Functional Requirements Analysis

Analysis of non-functional requirements on these systems include software analysis, analysis of hardware and think.

1. Product Requirement

Here is a non-functional requirements based on product classification requirement

a. SKPL-NF-001 system built has two subsystems: web and mobile

b. SKPL-NF-002 system is built using a minimum of android operating system version 5.0 Lollipops and built with minimum software requirements

- *a. Operating systems (platform independent)*
- *b. The code editor in the form of a text sublime 3*
- *c. Integrated development environment (IDE) in the form of Android Studio*
- *d. Android Development Tools 22.1.6 version as Android Studio plugins*
- *e. Android Software Development Kit as a framework android*

c. SKPL-NF-003 system is built using the device camera

d. SKPL-NF-004 system is built with hardware specifications that meet minimum standards requirements such as

- *a. Komputer dengan Vga on board 512 MB*
- *b. Screen with a resolution 1024x480*
- *c. Computer with ram 2 GB*
- *d. Android device with ram 512*
- *e. Device android with resolusi 320x480*

2. Organisation Requirement

Here is a non-functional requirements based classification Organisational Requirement.

a. *SKPL-NF-*005 Design of the user interface on the software that will be built referring to the design guidelines of google android

3. External Requirement

Here is a non-functional requirements based classification External Requirement.

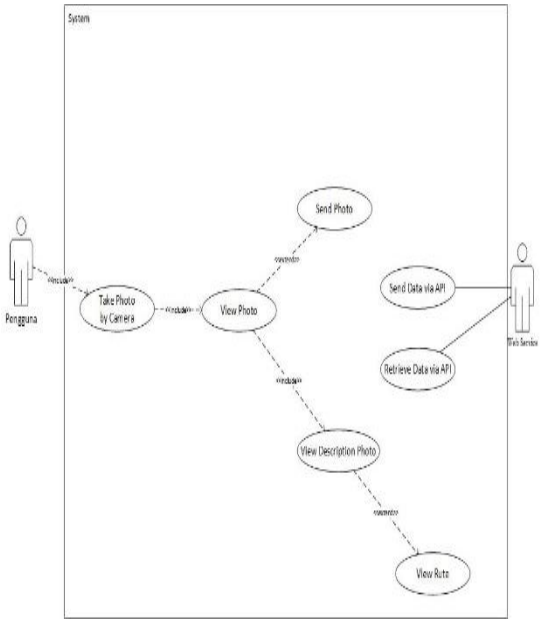
a. SKPL-NF-006 The system does not allow content that contains elements of racism, pornography and norms of decency

b. SKPL-NF-007 The software is built must generate a standard file format (.json) that can be used by external interested parties

4. User Analysis

2.1.9 Mobile Functionality Requirements Analysis

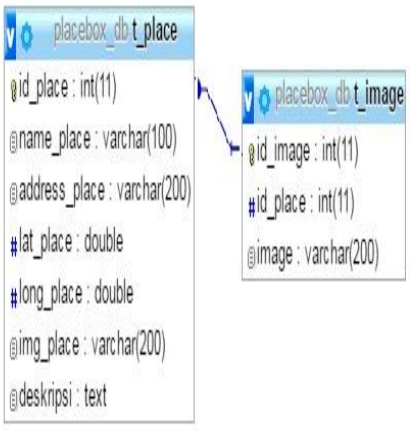
Here is a usecase of software subsystems built Android



Gambar III. 4 Use Case Diagram

2.1.10 Analysis System Design

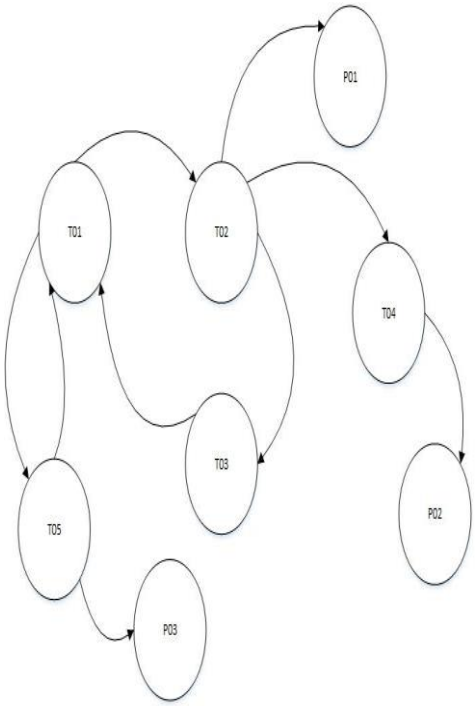
Here is a picture-relationship diagrams of the software to be built



Gambar III. 5 Diagram Relasi

2.1.11 Semantic Network

Semantic knowledge networks merupkan overview graphic that shows the relationship between objects (circles) and lines depicting the formation of inter-object. The semantic network for peangkat constructed as follows



Gambar III. 6 Semantic Network

2.1.12. Implementation and Testing System

Implementation stage is the stage translation system design based on the results of the analysis into a particular programming language and application software that is built on a real environment

2.1.12.1. Environment Implementation

Implementation environment is a specification of hardware, software and servers where the system will be installed and accessed

Tabel 2 Android Hardware environment

Hardware
Android 5.0 Lollipop
TFT LCD
5 Megapixels Camera Resolution (Rear)
Jaringan GSM / CDMA
Data Koneksi HSDPA / EVDO
A-GPS Support

Here are the software requirements specification used in the development of this software is

Tabel 3 Software Software Development Environment

Software
Sistem Operasi Android 5.0 Lollipop

Here are the server requirements specification used in the development of this software is

Tabel 4 Environment Server Software

Sub sistem web
Web Space 500 MB
Bandwidth 50 GB Bulan
MySQL Database (5.1 & 5.5)
PHP (5.2 & 5.3)
CPanel 11.x
Apache 2.x mod_deflate

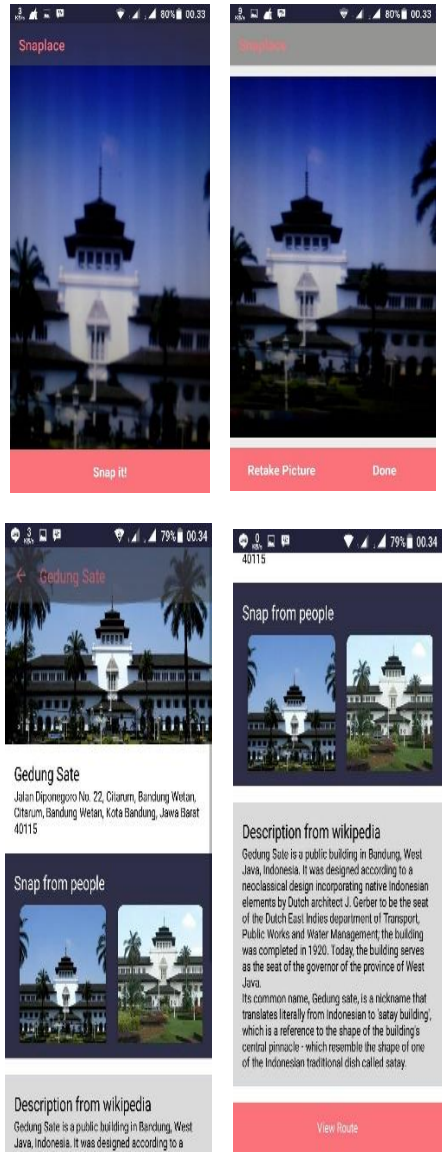
2.1.12.2. Data Implementation

Implementation of the database is an implementation based on the design of the database created previously, Physically implementation of this database using MySQL 5.0.10.

2.1.12.3. ImplementationIinterface

Implementation of the interface contains the exposure of each display software that was built along the xml file as the layout of each interface

Here is an implementation of the interface of the android mobile platform system that can be seen in Figure 6



Gambar III. 7 implementation interface

3. FINALITY

A. Conclusion

Based on the results of software testing snap place on android platform it could be concluded as follows

1. *Tangging photo software for the introduction of the tourist attractions the city of Bandung on android platform has been built successfully using technology geotagging*
2. *Software snap place in the android platform is already helping travelers to get an explanation of information being visited travel*

B. Suggestion

There are some suggestions that can be used as a guide to software development towards the better to support the growth of users and content on this Place Snap software. As for suggestions on software development snap place is as follows

REFERENSI

[1] "BPS Indonesia," [Online]. Available: www.bps.go.id. [Diakses 23 09 2016].

[2] IDC wordwide Mobile Phone Tracker 2015,2014,2013,2012 http://www.idc.com/promo/smartphone-market-share/vendor

[3] "Bandung Toursm",[online] http://www.bandungtourism.com/office.php

[4] J. H.M, Analisis dan Disain Sistem Informasi, Yogyakarta: Andi, 2001

[5] S. R, D. P, S. J and N. To, The Android Developer's Cookbook, 2nd, New Yorks, United States: Addison-Wesley, 2013

[6] JSON Org. Pengenalan JSON. [Online]. http://www.json.org/json-id.html

[7] Ary, Mardani. Sistem Informasi Geografis Pelaporan Masyarakat (SIGMA). Program Studi Teknik Informatika. Universitas Tanjungpura.

[8] *D. Namiot, "GeoFence Services," injoit.org (International Journal of Open Information Technologies), 2014. [Online]. Available: http://injoit.org/index.php/j1/article/view/51/48. [Accessed 19 September 2016*]