IMPLEMENTATION GPS PHOTO GEOLOCATION TECHNOLOGY AND GOOGLE PLACE API TO AVOID A FAKE REPORT ON THE PUBLIC SERVICE REPORTING APPLICATION BASED ON ANDROID

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ABSTRACT

Currently there are several android apps that are used as a medium for public reporting on public services, better services from the government as well as services from the private sector. All applications are available in the official Google app store, Google Play Store. Here is a picture that displays reporting application taken from the Play Store with search keywords "Reporting". From some of these applications, the most widely installed and used by the public is the application and the application Qlue REPORT. According to recent data from the Play Store (accessed on August 24, 2016) the total number of app downloads Qlue has reached 100000-500000 downloads. While the total number of app downloads reach 10:00 REPORT - 50,000 downloads. This may be an indication that society has many uses both applications. Both applications are perceived to be quite help people in reporting complaints or aspiration of the public services provided. However, the application must not be separated from some of the problems, this can be evidenced by the few users complain about the performance of applications, especially in the part of the application's functionality.

Based on the problems described, it would require an expansion in terms of the functionality of both applications. Mainly to avoid making the report "Abal Abal" or fake. Therefore, the authors intend to conduct research on how to build an application that is used as a medium of public reporting on the complaint, the response, the aspiration for public services available, either from the government or private parties.

Based on test results using black box testing methods and acceptance can be concluded that the software is constructed is able to prevent the making of false statements by a member of the community and the media can be a grievance on the quality of public services.

Keywords*: Geotagging, GPS, Aplication, Report, Android, Community.*

1. INTRODUCTION

Currently there are several android apps that are used as a medium for public reporting on public services, better services from the government as well as services from the private sector. All applications are available in the official Google app store, Google Play Store. Here is a picture that displays reporting application taken from the Play Store with search keywords "Reporting".

From some of these applications, the most widely installed and used by the public is the application and the application Qlue REPORT. According to recent data from the Play Store (accessed on August 24, 2016) the total number of app downloads Qlue has reached 100000-500000 downloads. While the total number of app downloads reach 10:00 REPORT - 50,000 downloads. This may be an indication that society has many uses both applications. Both applications are perceived to be quite help people in reporting complaints or aspiration of the public services provided. However, the application must not be separated from some of the problems, this can be evidenced by the few users complain about the performance of applications, especially in the part of the application's functionality. As proof, here is an image capture taken from reviews in the Play Store.

As for the application Qlue, negative reviews submitted by users is about the "Abal - abal" or false reports, often made by a number of individual users who abuse this application. This is consistent with survey results that have been made to the user Qlue, 25 of 30 respondents agreed that reporting features contained in the application Qlue can not avoid creating false reporting. False report intended for example users to report somewhere but not at the location of the place. As another example, a photograph taken by a user as reported does not match the name of the place were reported.

This weakness will certainly lead to problems that can be detrimental to all parties. It could be there are individual users of the application who deliberately made a false report that aims to bring down the reputation of a company or agency. In addition, application users also complain about the answer or response from reporting made tasted old and was not even considered by the service provider. Here is an image capture taken from reviews in the

app details page Qlue on the Play Store, there are some users who complained about the "Abal Abal" which was created and reporting are not considered.

Based on the problems described, it would require an expansion in terms of the functionality of both applications. Mainly to avoid making the report "Abal Abal" or fake. Therefore, the authors intend to conduct research on how to build an application that is used as a medium of public reporting on the complaint, the response, the aspiration for public services available, either from the government or private parties. Applications will utilize technology as a tool Photo Geolocation to avoid creating false reports. In addition, this study will also utilize Google Place API as a source of data points that can be reported by users. Based on data taken from the page https://developers.google.com/places/, there are more than 100 million names of places available on Google Place API's.

The platform is being used as a pilot project this software is an android with the consideration that the current android has a market share of 70% of all smart devices that are enabled [4]. With the development of this software is expected to be the perfect solution to become a media report the truth of society is more secure information.

1.1 Global Positioning System (GPS)

Global Positioning System is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the US Department of Defense were first introduced beginning in 1978. GPS services previously only used for military purposes, but began to open to the public. 24 GPS satellites are located 12,000 miles above the Earth moves around the earth 12 hours at a speed of 7,000 miles per hour. GPS satellites measuring the energy in sunlight, have a spare battery to keep it running during the solar eclipse or when there is no solar energy and has a small rocket boosters on each satellite to be orbited into place.

Privileged GPS is able to work in all weather conditions, day or night. The accuracy of a GPS device can reach 15 meters, even the latest technology equipped models Wide Area Augmentation System (WAAS) accuracy to 3 meters [3].

1.2 GPS Photo Tagging (Geotagging)

GPS Photo Tagging also known as *geotagging*, a process of adding position information to the GPS data (*Latitude, Longitude, Altitude*) in a digital photo. Mobile phones with cameras that have an internal GPS receiver generally has this feature. *PhotoTagging GPS* mechanism is when a photo is taken using a camera (digital or mobile phone) that features *geotagging*, camera or mobile phone record more information / data is compared with an image taken with a regular camera. Such information includes the time and data when a photo is taken, the orientation of the camera (*portrait or landscape*), whether to use flash and other camera details used such as Aperture, Exposure, and Local Length. All this data is stored in a place called EXIF Headers.

EXIF (*Exchangeable Image File Format*) *Headers* containing instructions images with data that can be read by a photo management application or a particular photo site. In addition, the EXIF *Headers* also provides a space to fill coordinates *Longitude, Latitude, and Altitude* [3].

1.3 EXIF Headers

Data EXIF (*Exchangeable Image File Format*) is the data stored by the digital camera to an image that contains information about the condition and setting the digital camera at the time of the shooting. 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 or a digital image and hardware such as cameras, and supported by almost all digital cameras.

General information can be obtained from a digital photo EXIF is among others [3]:

1. Date and time when a photograph is made.
2. Brand, camera type, and the type of lens used for taking photographs.
3. The resolution of the camera used to take pictures. Used or not the flash on the camera features.Lokasi foto tersebut diambil, jika kamera yang digunakan mendukung GPS.
4. The location the photo was taken, if the camera is used to support GPS.

1.4 EXIF Interface Android Class

ExifInterface class is one class in android programming that can be used to read and write the Exif tag information on the files in the JPEG format.

Here is the Table 1 Tag EXIF Exif information the can be retrieved.

Table 1 Tag EXIF

No.	Tagging	Keterangan
1	TAG_APERTURE	Type is String.
2	TAG_DATETIME	Type is String.
3	TAG_DATETIME_DIGITIZED	Type is String.
4	TAG_EXPOSURE_TIME	Type is String.
5	TAG_FLASH	Type is int.
6	TAG_FOCAL_LENGTH	Type is rational.
7	TAG_GPS_ALTITUDE	The altitude (in meters) based on the reference in TAG_GPS_ALTITUDE_REF.
8	TAG_GPS_ALTITUDE_REF	0 if the altitude is above sea level.
9	TAG_GPS_DATESTAMP	Type is String.
10	TAG_GPS_LATITUDE	String

11	TAG_GPS_LATITUDE_REF	Type is String.
12	TAG_GPS_LONGITUDE	String
13	TAG_GPS_LONGITUDE_REF	Type is String.
14	TAG_GPS_PROCESSING_METHOD	Type is String.
15	TAG_GPS_TIMESTAMP	Type is String.
16	TAG_IMAGE_LENGTH	Type is int.
17	TAG_IMAGE_WIDTH	Type is int.
18	TAG_ISO	Type is String.
19	TAG_MAKE	Type is String.
20	TAG_MODEL	Type is String.
21	TAG_ORIENTATION	Type is int.
22	TAG_SUBSEC_TIME	Type is int.
23	TAG_SUBSEC_TIME_DIG	Type is int.
24	TAG_SUBSEC_TIME_ORIG	Type is int.
25	TAG_WHITE_BALANCE	Type is int.

1.5 Android

Android is an operating system for Linux-based mobile devices that includes an operating system, middleware, and applications. Android is an operating system for mobile phones based on Linux. Android provides an open platform for developers to create their own applications. Initially developed by Android Inc., a firm newcomers who make software for mobile phones which was later purchased by Google Inc. For its development, formed the Open Handset Alliance (OHA), a consortium of 34 companies hardware, software, and telecommunications, including Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and Nvidia [5].

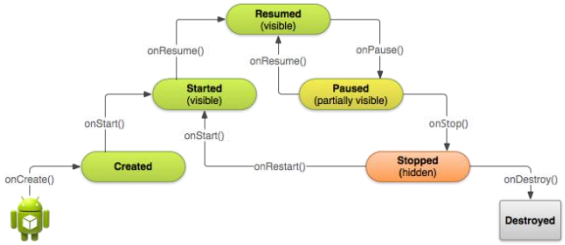
1.6 Android Life Cycle

Android application consists of some basic functions such as editing a note, play music files, sound an alarm, or open the phone contacts. Those functions can be classified into four different android components as shown in, the classification is based on the basic java classes used [7].

Table 2 Android Aplication Components

Functionality	Java Base Class	Examples
Focused thing a user can do	Activity	Edit a note, play a game
Background process	Service	Play music, update weather icon
Receive messages	BroadcastReceiver	Trigger alarm upon event
Store and retrieve data	ContentProvider	Open a phone contact

Application of the life cycle is also useful to make sure the application does not consume battery power source users [8].



Picture 1. Android Life Cycle

There are several states in the life cycle android that occur as illustrated in Picture 1. Android Life Cycle [8], but only a few of those who become static state include:

1. Resumed

Resumed occur when the application runs after a paused state. This state will run the command program written in onResume method () (Google Inc, 2014).

2. Paused

In this state the activity that occurs temporarily suspended but is still visible to the user because there is a process that has a higher priority such as phone calls. Applications can not run any command or displaying anything in this state. (Google Inc, 2014).

3. Stopped

In these circumstances, the application really is not displayed and are not visible to the user but still leaving the service at background (Google Inc, 2014).

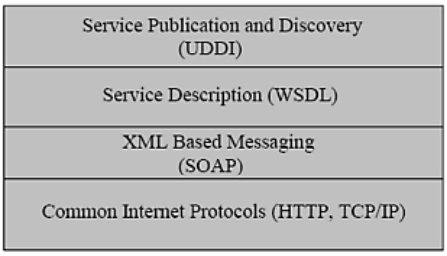
State such as Created and Started temporary and the system quickly run the next state by calling the callback the next life cycle. That is, once the system OnCreate () is called, quickly the system will call the method OnStart (), followed by onResume krmudian () (Schwarz, Dutson, Stelee, & To, 2013).

1.7 Web Services

Web service is a software component that is selfcontaining, self-describing modular applications that can be published, allocated and executed on the web. Web services is a technology that converts Internet capabilities by adding a web transactional capabilities, the ability of the web to communicate with the pattern of program-to-program (P2P). The focus of the web has been dominated by the communications program-to-user interactions with business-to-consumer (B2C), while transactional web will be dominated by the program-to-program interaction with business-to-business.

The picture below illustrates the building blocks of web service which provides the facility of remote communication between the two applications is a web services layer architecture.

1. Layer 1 : Internet protocol standard that is used as a means of transport is HTTP and TCP / IP.
2. Layer 2 : Simple Object Access Protocol (SOAP) based on XML and is used to exchange information between a group of services.
3. Layer 3 : Web Service Definition Language (WSDL) is used to describe the attributes of service.
4. Layer 4 : Universal Description, Discovery and Integration, which is a central directory for a description of the service.



Picture 2. Buildings Block Of The Webservice

1.8 Java Script Object Notation (JSON)

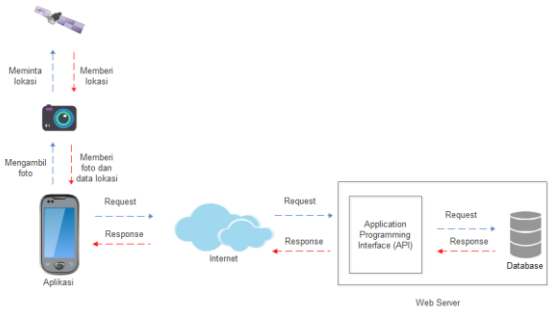
JSON (JavaScript Object Notation) is a lightweight data interchange format, readable and writable by humans, as well as easily translated and made (generated) by the computer. This format is based on part of the Programming Language JavaScript, Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is independent of the programming language whatsoever for using 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 JSON data-exchange language [6].

2. RESEARCH CONTENT

2.1 Analysis System Architecture

The analysis aims to identify the system architecture architectures to be built.

The mobile platform is one of the subsystems selected for the development of this software. Architecture software on the mobile platform describes how the software interact with each other as illustrated in Picture 4 Architecture Software on Mobile Platform. The image depicts the overall architecture of the system on mobile platforms.



Picture 4. Architecture Software on Mobile Platform

Below is description of Picture 4 Architecture Software on Mobile Platform:

a. The mobile device users to take photos from the camera.
b. Cameras make requests to the satellite location data.
c. Satellites send location data of mobile device users.
d. The *mobile* device user request data to the server via the API
e. The server receives the data request from the API
f. The server receives data from API request and then the server will retrieve data contained in database.
g. After the server receives request data from database, the data will be restored and converted in the form of JSON by API.
h. Data taken by a mobile system in the form of JSON for processing the user's mobile device.

1.2 Non-functional Requirements Spesification

The following is a non-functional specifications that can be seen in Table 3 Non-Functional Requirement Specification.

Table 3. Non-functional Requirement Specification

Kode SKPL	Spesifikasi Kebutuhan Perangkat Lunak
SKPL-NF-001	Sistem yang dibangun memiliki dua subsistem yaitu web dan mobile
SKPL-NF-002	Sistem yang dibangun minimal menggunakan sistem operasi android versi 4.0 Ice Cream Sandwich
SKPL-NF-003	Sistem yang dibangun menggunakan perangkat kamera
SKPL-NF-004	Sistem dibangun dengan spesifikasi hardware yang memenuhi standar minimum kebutuhan
SKPL-NF-005	Desain *user interface* pada perangkat lunak yang akan dibangun mengacu kepada *design guidelines* android dari google

1.3 Analysis Of Non-Functional Requirements

Analysis of non-functional requirements in this system include:

1. Product Requirement

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

a. SKPL-NF-001 The system has two subsystem are built, web and mobile.
b. SKPL-NF-002 Minimal system built using the android operating system version 4.0 Ice Cream Sandwich and built with minimum software requirements.
   a) Operation System (free platform).
   b) Web server XAMPP version 1.1.7 up as a web server.
   c) Code editor such as Notepad++.
   d) Integrated development environment (IDE) the form Android Studio.
   e) Android Development Tools versi 23.0.0 as plugins Android Studio.
   f) Android Software Development Kit as framework android.
c. SKPL-NF-003 The system was built using the device camera.
d. SKPL-NF-004 Sytems built with the hardware spesifications that meet minimum standard requirements such as:
   a) Computer with VGA on board 512 MB
   b) Screen with a resolution 1024x600
   c) Computer with RAM 2 GB
   d) Android device with a RAM 512
   e) Device android with a resolution 320x480

2. Organisational Requirement

Here is a non-functional requirements are based on the classification Organisational Requirements SKPL-NF-005 Design of the user interface on the software that will be built referring to the design guidelines of google android.

1.4 JSON Data Structure

Analysis of the data used in this study is the Object Relational Mapping (ORM). Object relational mapping mapping the tables in the relational database with an existing entity class in object-oriented programming language.

Scans taken ORM will require a bridge in the form of JSON data format that can connect ORM with existing physical database on a server. The structure of the JSON data format used in this study is divided into three object data, the data arrays and null data.

a. Object Data

Format in Table 4 Structure of JSON Data Objects is used when data is received from the server is a single data or in the form of an object.

Table 4. JSON Object Data Structure

Struktur data objek

{
“key” : “value”
}

a. Data Array

Format in Table 5 Structure Array JSON data is used when data is received from the server is a single data or in the form of an object.

Table 3. JSON Array Data Structure

Struktur data array

{
"result" : "value",
"item" : [{ "key" : "value" },{ "key" : "value" }]
}

b. Data Null

Format in Table 6 Structure of JSON Data Null is used when data is received from the server is a single data or in the form of an object.

Table 4. JSON Null Data Structure

Struktur data null

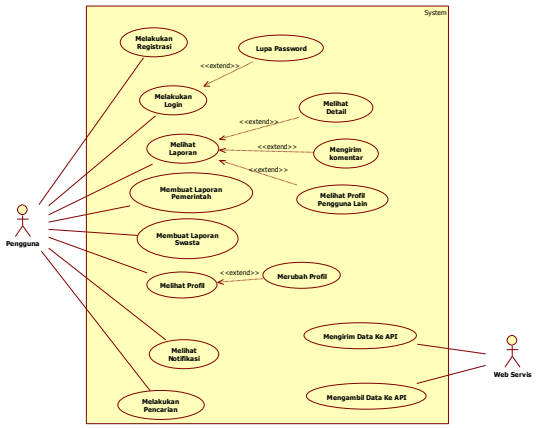
{
"result" : "value",
"message" : "value",
"status_code":value
}

2.6 Analysis Of The Functional Requirements Of Mobile

Functional Needs Analysis Mobile using use case diagrams to describe the existing functionality in perangakat software to be built.

1. Use Case Diagram

Use Case Diagram is a model to describe the behavior (behavior) software to be created.



Picture 1. Use Case Diagram

2.7 Definisi Use Case

In Table 7 Definition Use Case use case contains a list and brief description of the use case.

Tabel 5. Definition Use Case

No	Use Case	Description
1	Registration	The system displays the register form for users registered as a member.
2	Login	The system displays the

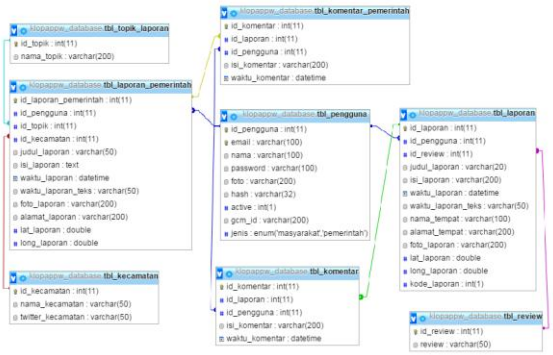
		login form for users, consisting of email and password.
3	See Report	The system provides users the ability to view user-created reports.
4	See The Detail Report	The system provides users the ability to view detailed reports made users.
5	Post a Comment	The system provides a facility for users to post comments.
6	View Other User's Profile	The system provides the facility for users to view other users' profiles.
7	Make Government Report	The system provides users the ability to make a report to the government.
8	Made a Private Report	The system provides the facility for users to create reports to private.
9	View Profile	The system provides users the ability to view personal profile.
10	Change Profile	The system provides users the ability to change the personal profile data.
11	See Notifications	The system provides the facility for users to view notifications.
12	Searching	The system provides users the ability to search the data report.
13	Forgot The Password	The system provides facilities for users to remind the password.
14	Send Data To API	The system has the ability to send data to the API.
15	Receive Data From API	The system has the capability to receive data from the API.

2.8 The Design Of Data

Here is the data from the design software built.

1. Diagram Relation

Here is a Diagram Relation of software built.



Picture 2. Diagram Relation

2.9 System Implementation

Implemementasi stage is a 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. In this phase there is a need for such a system suggested.

1. Hardware Requirements

In Table 8 Minimum Hardware Requirements shows recommended hardware requirements in the implementation phase.

Table 6. Minimum Hardware Requirements

Sub sistem web	Sub sistem mobile
Processor core i3 @2.30 Ghz	Android 5.0 Lollipop
Harddisk 500 GB	TFT LCD
RAM DDR3 2GB	5 Megapixels Camera Resolution (Rear)
VGA 128 MB	Jaringan GSM / CDMA
Resolusi layar 1366x768 Pixel	Data Koneksi HSDPA / EVDO
Koneksi Internet	A-GPS Support

2. Software Requirements

In Table 9 Requirement Minimum Recommended Software Shows software in the implementation phase.

Table 7. Minimum Software Requirements

3. Server Requirements

Table 10 Minimum Requirements Server Using server recommended the implementation phase.

Table 8. Minimum Server Requirements

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

2.10 Testing System

Phase Tests conducted for the software that is built consists of three parts.

1. Test Plan

System testing will be performed divided into two stages. The first phase of testing focused on the functionality of the software that is built using blackbox testing method. The second phase of testing will focus on the assessment of software that is built, the method of data collection is done is giving questionnaires to 10 of the Bandung.

2. Functionality Testing Result

Results of testing the functionality of the software that is built as shown in Table 11 Results of Testing Functionality.

Table 9. Functionality Testing Results

Kelas Uji	Poin Pengujian
Login pengguna	Input data login
	Validasi login
Daftar pengguna	Input data registrasi
	Te tombol daftar
Buat laporan pemerintah	Input data laporan pemerintah
	Tekan tombol kirim
Buat laporan swasta	Input data laporan swasta
	Tekan tombol kirim
Kirim komentar	Input data komentar
	Tekan tombol kirim
Cari laporan	Input data pencarian
	Tekan tombol cari

3. Result Of Beta Testing

Table IV.46. Data from beta testing can take several conclusions including.

From the first purpose elicits responses from users that users feel confident and helped with the application of this to avoid creating false reporting by unscrupulous people. This is evident from the results of beta testing for the purposes of the first to get an average score of 3.92.

The second goal of the acquired response from the user that the user feels helped in making and submit complaints and reports on the quality of public services. This is evident from the results of beta testing for the second goal to get an average score of 4.5.

3. CLOSING

Based on the results of testing the software fit the android platform it could be concluded as follows:

1. The software fit in android platform has been able to prevent the making of false statements by utilizing geolocation photo.
2. The software fit in android platform is already helping people to make a report and submit a complaint on the quality of public services.

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

1. In cooperation with the government more broadly that the report sent actionable quickly.
2. Develop software in terms of performance and user experience better.
3. Develop a platform that can be supported by the software since currently only supports Android platform.

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