

The Development of Visit Ancol Dreamland with Augmented Reality (VADAR) Mobile Application

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ABSTRACT

Along with the development of mobile devices such as smartphones which become more sophisticated, citizens of Jakarta as users are enabled to get the information about recreation parks that they want to visit for recreation. One of the most popular recreation parks which is the most heavily visited by tourists in Jakarta, based on data BPS Jakarta, is Ancol Dreamland.

Travel guide system is needed to facilitate tourists of Ancol Dreamland to search and to see information about Ancol dreamland. The objective of this research is to develop a travel guide application called Visit Ancol Dreamland with Augmented Reality (VADAR) by using *bahasa* for the application language.

The methods of this research are collecting data, requirements analysis, application design, implementation, and testing. This application is implemented on android and it can display information about recreation, culinary and resort in Augmented Reality Camera-View, besides that it can also display directions to the theme parks, information about Ancol Dreamland profile, news, map location and ticket prices. Based on the user acceptance testing that has been done, it can be concluded that this application is feasible to be used.

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1. INTRODUCTION

Urban citizens as those living in Jakarta almost every day are busy with their daily activities. They need a vacation or recreation on the sidelines of their daily activities as one of the ways to release tired. Jakarta is a city that never dies. It is always full of frenetic urban life and it has a lot of recreation parks for instance Taman Mini Indonesia Indah(TMII), Ragunan zoo, Ancol Dreamland, The National Monument and many others.

Currently people tend to use mobile devices such as Smartphone to access the information about recreation parks. By using mobile devices such as a Smartphone, they can access the information about recreation parks anytime and anywhere easily. One of the operating system for Smartphone which is the most widely used in the world is Android. International Data Corporation (IDC) as the premier global provider of market intelligence has issued a press release saying that while BlackBerry remained the number one smartphone brand in the country in Q2 2012, Android has overtaken BlackBerry as the most popular operating systems (OS) in the country with a market share of 52% [1].

BPS Jakarta shows data concerning the number of tourist visits in best recreational parks by the location of recreational park in Jakarta in 2007 to 2011. See table 1 [2].

Table 1. Number of Tourist Arrivals in Best Recreational Parks in Jakarta

Objek Wisata	Tahun				
	2007	2008	2009	2010	2011
1. Taman Impian Jaya Ancol	13.377.011	13.567.630	12.920.733	12.834.890	0
2. Taman Mini Indonesia Indah	3.808.176	4.510.679	4.822.945	5.298.719	0
3. Kebon Binatang Ragunan	3.392.223	3.319.186	3.545.212	3.580.024	0
4. Monumen Nasional	708.757	924.445	2.112.217	1.253.266	0
5. Museum Nasional	157.905	104.739	165.907	375.710	0
6. Museum Satria Mandala	48.591	77.525	53.769	63.797	0
7. Museum Sejarah Jakarta	75.067	119.641	245.682	724.082	0
8. Pelabuhan Sunda Kelapa	17.217	14.648	12.677	34.112	0
Jumlah Kunjungan Wisatawan ke Obyek Wisata Unggulan	21.584.947	22.638.493	23.879.142	24.164.600	0

Based on the table above, Ancol Dreamland is the most heavily visited by tourist which makes it to be a promising and potential tourism area. Additionally, okezone.com in an article mentions that Ancol Dreamland in 2010 has received international recognition for its service excellence stating the number of foreign tourists visiting Ancol Dreamland has reached an average of more than 10% of the total tourists annually [3].

The theme parks located in the area of Ancol Dreamland mostly unreadable on the map, which makes tourists face difficulties in estimating location, distance and directions to be taken. With the help of Geographical Information System and Augmented Reality tourists can easily find out location, distance and directions that can be taken to go to the desired theme parks. But, There is no related work done in Augmented Reality for Ancol Dreamland.

Looking at the facts above, the opportunity to develop a travel guide application is enormous. The authors looks at the opportunity and tries to develop Visit Ancol Dreamland with Augmented Reality (VADAR) application which is an android-based Ancol Dreamland travel guide application.

2. RESEARCH METHOD

VADAR, which stands for Visit Ancol Dreamland with Augmented Reality, will be implemented on Android Smartphone. The research method used in this application systems development refers to the Waterfall Model. The following is the development steps or methods of Visit Ancol Dreamland with Augmented Reality (VADAR) application:

1. Collecting Data.
 - a. Bibliography and Literature Studies, that is looking for paper on the development of Augmented Reality [4], [5], Location-Based Services [6], searching for books and articles relating to the design system [7], as well as searching for books on the android development in various libraries [8], [9].
 - b. Interactive Discussion (Forum Group Discussion Android) through the Internet.
 - c. Observation method was carried out at the Ancol Dreamland in order to get any content that exist in this application. Mixare application helps in gaining some theme park location data.
2. Requirements Analysis.
After completing the initial phase of the research, the data that had been collected will be analyzed in order to obtain the desired system requirements specification.
3. Application Design.
This step is undertaken to plan the design of applications and features that will be made.
4. Implementation and Testing.
The last phase is implementation of the software design phase that has been created earlier using Java programming language, XML, HTML, CSS, JavaScript, the Wikitude SDK tools, The Web Server/VADAR Server which is built by PHP language and MySQL for database management. Then, it is tested using android emulator and some android devices, one of which Sony Ericsson Xperia active.

3. RESULTS AND DISCUSSION

3.1. Analysis and Design

3.1.1. Requirements Analysis

In the VADAR application development process, it is needed to consider and to analyze the necessity of hardware and software that will be used so that the applications can run as it is expected. The required components are divided into two kinds, namely software and hardware components.

1. Hardware

To develop this VADAR application, the authors uses the following hardware:

- a) Notebook Axioo Neon CNW with specifications are, Intel Core i5 2.53 GHz Processor, 2 GB RAM, VGA Integrated Intel HD Graphics, and 500 GB Harddisk.
- b) Smartphone Sony Ericsson Xperia Active

2. Software

- a) Windows 7 Operating System
- b) Eclipse Java Juno with Sun Java SE version 1.7
- c) Notepad++, as PHP Editor Tool

3.1.2. Application Design

This section will explain the design of this application, including use case diagram, and navigation structure.

3.1.2.1. Use case Diagram

This section will explain the relationship between user and the application system in use case diagram. Firstly, user with VADAR application on the client side (user as client). Secondly, user with VADAR application on the server side (user as administrator). Use case diagram in VADAR system is shown in figure 1.

1. User as Administrator

User as administrator is the user that is responsible for the server. Because of his responsibilities, he is authorized to view, insert, delete, and edit the data of *Objek Wisata* (Theme Parks) and *Berita* (News). In this case, an administrator must log in first.

2. User as Client

User as client is the user in general who use VADAR application. If the user wants to use this application, the user does not have to log in first. After opening the application. There is some use case, namely see the profile of Ancol Dreamland, see news at Ancol Dreamland, Augmented Reality Camera-View, see map location of Ancol Dreamland, See Tickets Prices of Ancol Dreamland, and see the tutorial. Before running the Augmented Reality Camera-View, the user must set the radius first, select theme park in Augmented Reality Camera-View and see detail information of that theme park. Additional functions are useful for the user can "Get Direction" between user position and the theme park position in the map view.

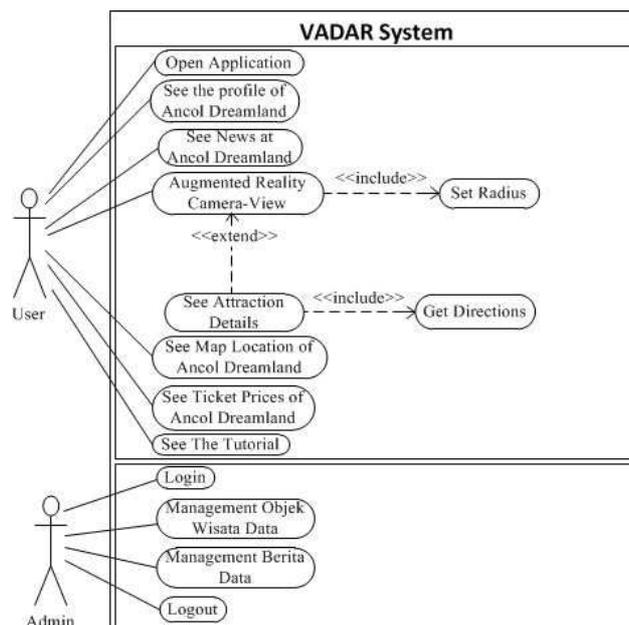


Figure 1. Use case Diagram In VADAR System

3.1.2.2. Navigation Structure

Navigation structure that is used in this application is a composite navigation structure. The beginning of navigation structure is the splash screen having linier navigation with main menu. On the main menu the user can select the 7 menus available. That is *profil Ancol*, *Berita Terbaru*, *modus ARCV*, *Peta Lokasi*, *Harga Tiket*, *Tutorial*, and *Tentang*. See figure 2.

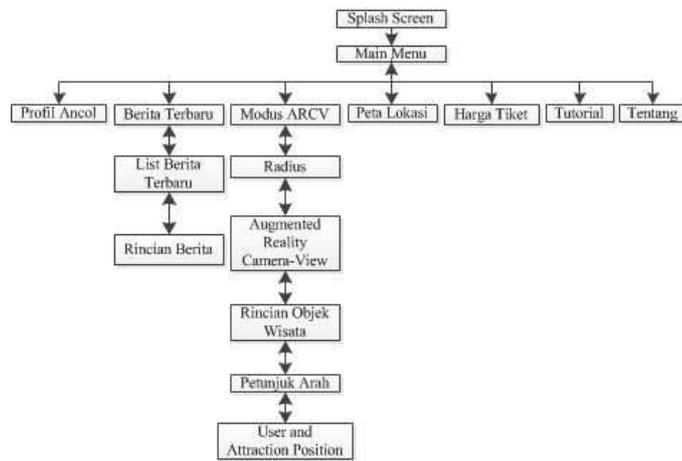


Figure 2. Navigation Structure

3.2. Implementation and Testing

3.2.1. Application Testing

At this step, the authors will conduct an application test on the Smartphone Sony Ericsson Xperia Active with Android version 2.3 (Gingerbread). To conduct this test at the Android device, firstly the authors connects USB cable between computer and the Smartphone Sony Ericsson Xperia Active, and changes device mode to debugging. The next step is debugging the VADAR application. In the project explorer the authors selects projects that will be tested, in this case the VADAR project and then he debugs the project. After the application is successfully installed, the application will be automatically executed. Results of application testing is shown in figure 3, figure 4, figure 5, and figure 6.



Figure 3. Splash Screen, Main Menu, *Profil Ancol* and *Berita Terbaru*

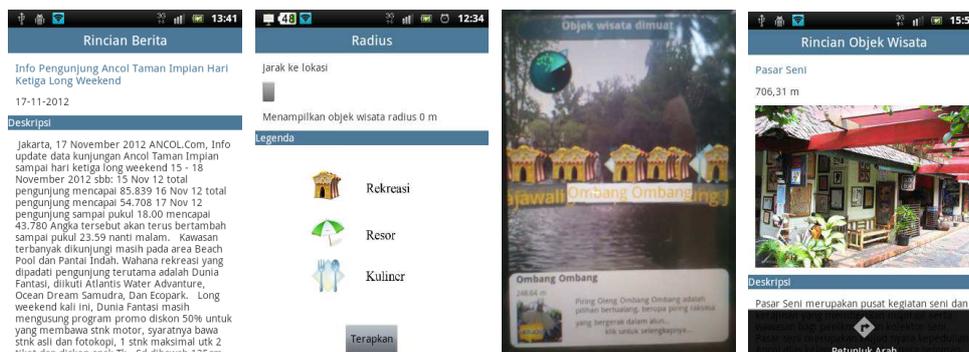


Figure 4. *Rincian Berita*, *Radius*, Augmented Reality Camera-View and *Rincian Objek Wisata*

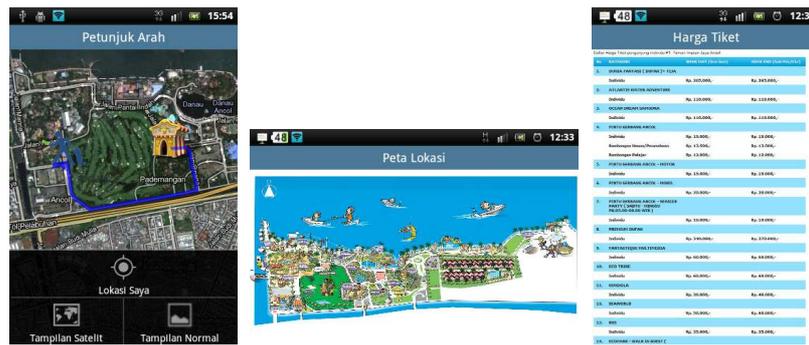


Figure 5. Petunjuk Arah, Peta Lokasi and Harga Tiket



Figure 6. Tutorial and Tentang

3.2.2. User Acceptance Testing

To find out whether this application is feasible to be used or not, the authors then do user acceptance testing by conducting surveys. It is conducted by sharing questionnaires to 10 users of this application with the age ranging from 12 years old to 50 years old in the area of Ancol Dreamland. The questionnaire consists of 5 pieces of assessment criteria and uses Likert Scale. References which are used to determine 5 parameter are based on Undergraduate Thesis entitled "Pembangunan Aplikasi Mobile Pada Situs Ngubek.com Berbasis Android". The following is the results of user acceptance testing which is performed in the field .See table 2.

Table 2. The Results of User Acceptance Testing

Parameter	Very Good	Good	Fair	Poor	Not Good
User interest toward this application	6	4	0	0	0
User helpfulness	5	5	0	0	0
The completeness of information	4	5	1	0	0
Interface is easy to understand	3	5	2	0	0
Ease of using the application	3	5	2	0	0

Based on table 2, the results show that 42% of the users consider that the application is very good, 48% consider good, 10% consider fair, 0% consider poor, and 0% consider not good.

4. CONCLUSION

VADAR application has been successfully developed. VADAR application on the Android-based Smartphone consists of useful information about profile of Ancol Dreamland, news, a variety of theme park (that is categorized into three categories namely recreation, culinary, and resort in Augmented Reality Camera-View), directions to the theme parks, map location, and ticket prices. Based on user acceptance testing that has been done, the results show that 42% of users consider that the application is very good, 48% consider good, 10% consider fair, 0% consider poor, and 0% consider not good. Based on these assessments test, it can be concluded that this application is feasible to be used.

For the future, this application can be developed by adding additional features. Besides that it also can be added features of zooming in and out dynamically in Augmented Reality Camera-View mode. Further, video content can also be added for each of the theme parks located in Ancol Dreamland.

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