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ANDROID-BASED EMPLOYEE ATTENDANCE SYSTEM WITH USING THE LOCATED BASE SERVICE METHOD AT THE AIR PERIUKAN SUB-DISTRICT OFFICE

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Abstract
In the current era of globalization, technological progress is very rapid, especially in the field of Technology. Where technological advances enter into all social, economic and educational fields. The development of computerized system needs the waterfall method is one of the SDLC models that is often used in the development of information systems or software. Black Box testing is a software testing method that tests the functionality of the application as opposed to the internal structure or work, this testing process tests to measure all attribute usability by application usersThe current attendance system requires a new system update. Because doing this will have a very good impact on the company in terms of efficiency, effectiveness and speed. This requires a design design before this system is made. Design an online attendance system using the LBS (Location Based Serviced) distance limiting method based on the Android application owned by each employee. This requires a local or internet network that is determined by the distance limit with the LBS whose coordinate points have been set. The system development method used is CASE (Computer-Aided-Software Engineering) using the concept of Unified Modeling Language (UML), while the diagrams used are Use Case Diagram, Activity Diagram and Class Diagram.

I. INTRODUCTION

In the current era of globalization, technological progress is very rapid, especially in the field of Technology. Where technological advances enter all social, economic and educational fields. The development of computerized system needs is also in line with the development of science and technology, especially computer science. Because it is well known that computers are able to play an important role as a tool in data processing and can solve even small to complex problems.

Every organization such as the government really needs a computerized system that is accurate, fast, and efficient. The attendance information system is one of the things that is very important to do to record employees in government agencies, especially the Air Periukan District, Seluma Regency. A facility or facility is needed to support and help carry out proper data processing. Thus the use of computers in generating information is needed in supporting the decision-making system.

The mismatch of attendance data can be detrimental to employees, there is often a difference between the attendance listed in the book / attendance list record into the system is one of the factors that make the original data and the data that has been verified into the system different. Too much data and must be verified manually allows differences between the original data and the data contained in the system.

In this modern era, where almost everyone has their own smartphone, it is possible that the *smartphone* can be utilized for an attendance system in offices, especially the Air Periukan Sub-district office. The idea that emerged was to utilize the *located base service* obtained by the Android

smartphone GPS to become an attendance system. Where using a *smartphone* GPS system can find out where the location of sub-district employees is, then equipped with a *latitude* and *longitude* data retrieval system so as to reduce cheating from employees.

II. LITERATURE REVIEW

2.1. Definition of System

The definition of a system is a set of objects that are related and interact with each other and the relationship between objects can be seen as a unit designed to achieve one goal. Thus, in simple terms the system can be interpreted as a collection or set of variable elements that are mutually organized, interact with each other, and depend on each other[1][2]. in a book entitled Information System Concepts, a system is a network of interconnected procedures, gathered together to carry out activities or to carry out certain goals[3].

2.2. Definition of Attendance

Attendance is a list of employee/student attendance, which contains arrival hours, return hours, and reasons/explanations for employee attendance. Attendance is also a list of data collection of a person's presence from an activity in an institution that is organized and arranged in such a way that it can be used by interested parties. Where data from employees who are absent will be recorded in the staffing list and can be checked at any time by the agency[4], [5]. In English, the use of the word absent is often used as the term *List of Absent*, which means someone who is not present at a meeting while the use of the word attendance is often used as the term *List of Presence* or *List of Participants*[6].

2.3. Definition of Employee

Employees are everyone who works by selling their energy (physical and mind) to the company and obtaining compensation in accordance with the agreement[7], [8]. Says that employees are physical and spiritual (mental and mind) human labor which is always needed therefore it is one of the main capitals in cooperative efforts to achieve certain goals (organization). Furthermore, employees are people who are employed in a particular agency, both in government institutions and in business entities. Meanwhile, according to the Indonesian dictionary, employees are people who work for an institution by getting a salary (wage)[9], [10].

2.4. Definition of Android

Android is an operating system for mobile phones based on Linux. Android provides an open platform for developers to create their own applications for use on various mobile devices. Android is commonly used in smartphones and tablet PCs. It functions similarly to the Symbian operating system on nokia, iOS, Apple, and BlackBarry OS[11].

2.5. Definition of *Located Base Service*

According to Budiman (2019) *Location* Based *Service* or better known as *Location Based Service* (LBS) is a general term used to describe the technology used to find the location of the device we are using. LBS is an information service that can be accessed via a *mobile device* using a *mobile network*, which is equipped with the ability to utilize the location of the *mobile device*. [4]. There are two main elements in LBS, namely:

- *Location Manager* (Maps API)

Providing *tools/sources* for LBS, the Maps *Application Programming Interface* (API) provides facilities to display, manipulate maps/maps along with other *features* such as satellite views, streets, or a combination of them.

- *Location Provider* (API *Location*)

Provides location search technology used by *devices*. The Location API deals with GPS (*Global Positioning System)* data and *real-time* location data. The Location API is located in the android package, namely in the android. Location-package. With Location Manager, we can determine our current location, track movements/movements, and proximity to certain locations by detecting displacements.

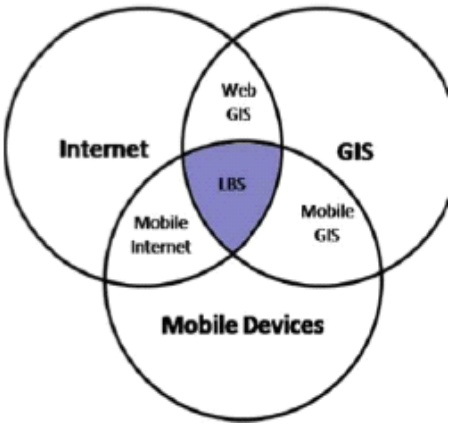

Figure 1. Located Base Service Technology

Location Based Service can be described as a service that is at the confluence of three technologies namely: *Geographic Information System, Internet Service, and Mobile Devices. Location Based Services* technology focuses on how to determine the position of the equipment you are using or called the *positioning* method. When talking about *positioning*, some of the systems used can be divided into three types, namely:

- Manually

The manual method is the conventional method that has often been done either through *yellow pages*, telephone operator assistance, and so on. These methods are certainly very troublesome and have begun to be abandoned. The advent of the internet gave a new perspective to this broader search facility. Coupled with the advent of cellular communication,

mobility has certainly increased. By combining these two technologies, it is certain that manual methods will be abandoned.

- Via GPS *(Global Positioning System)*

GPS is a worldwide radio navigation system that utilizes 24 satellites along with earth stations. Through this system, the earth is divided into squares with each having a unique address so as to precisely identify each location.

- Through *Cellular Based Station* or BTS *(Base Transceiver Station)*

Cellular Based Station technology, based on cellular telecommunication networks, allows indoor use. A mobile phone can be determined in its current position. Based on the relative position of a mobile phone in one or more nearby *cell towers* by considering the signal used to serve a mobile phone. By using the triangulation principle, the position of the mobile phone can be detected. *Cellular Based Station* has a very poor accuracy when compared to using GPS.

2.6. Android Studio

Android Studio is an *integrated development* environment (IDE) for developing on the android platform. Android Studio is software that can increase productivity and simplify the work of creating android applications. Android studio provides various features and tools that are needed by developers (developers) with java programming. Android studio was introduced by Google officially in 2013. In this study the authors used java as a programming language.

PHP is a programming language that is widely used to handle the creation and development of a web and can be used in HTML. PHP stands for "PHP: *Hypertext Preprocessor*", and is a language that is included in HTML documents, while working on the *server* side (*server-side HTML-embedded scripting*). This means that the syntax and commands given will be fully executed on the *server* but included in the regular HTML page, so the *script* is not visible on the *client side*. PHP is designed to work with database *servers* and is made in such a way that creating HTML documents that can access the database becomes so easy.

The purpose of this language is to create applications where the application built by PHP will generally provide results in the web browser, but the whole process is executed on the *server*. PHP is currently quite popular as a web programming tool in the Linux environment. However, PHP can also function on UNIX, Windows, and Macintosh-based servers.

III. RESEARCH METHODS

3.1. Data collection

Data collection is an effort made to obtain information in the form of data needed in research. Data can be obtained through interviews, observations and literature studies. The data is then analyzed to obtain documentation of user needs to be used in the next stage.

3.2. Waterfall Method

- Analysis

The next stage after the data is collected is the system requirements analysis stage. This activity is intensified and focused on the system, namely analyzing the needs and process requirements of the system to be built.

- Design

This stage is done before coding. aims to provide an overview of what should be done and how it looks. This process involves data structure, architecture, software, procedural *interface* representation.

- Encoding

The implementation stage is the stage of converting the design that has been made into a collection of code that will be run by a computer. The programming language used by the author is PHP.

- Testing

Combining the modules that have been made in the previous stage and testing is carried out to find out whether the system made is in accordance with the design and there are still errors or not.

- Maintenance

In the last stage, the software that has been run must be maintained. This maintenance includes fixing errors in the software that were not found in the previous stage[12][1][13].

IV. RESULTS

4.1. Desain System

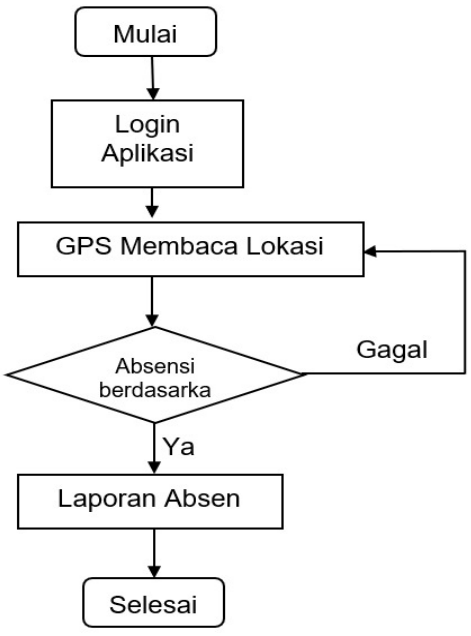

Figure 2. Flowchart

Usecase Diagram

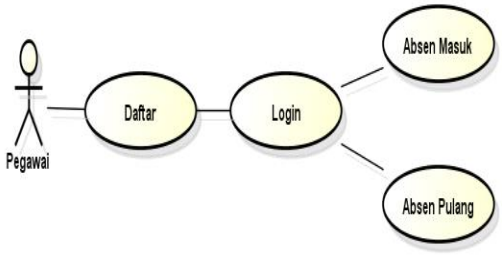

Figure 3. Usecase Diagram

Sequence Diagram

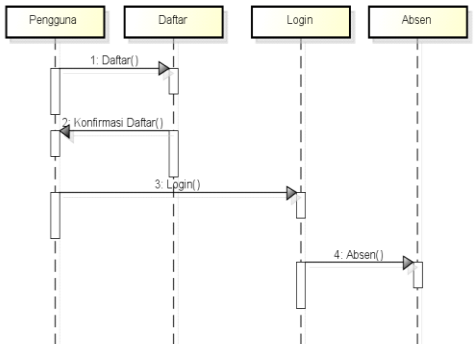

Figure 4. Sequence Diagram

Class Diagram

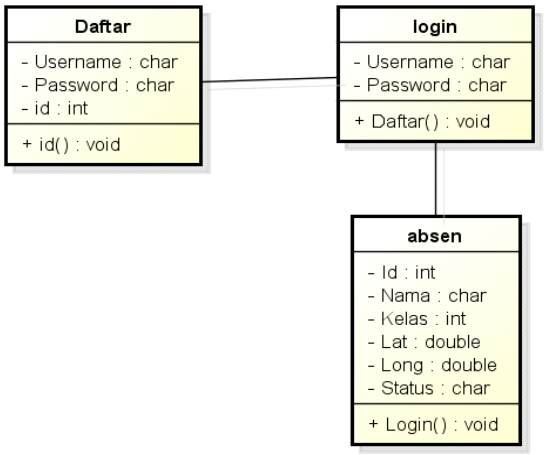

Figure 5. Class Diagram

The results of the android-based employee attendance system using the *located base service* method at the Air Periukan District Office are as follows:

- This application uses java programming language and database using realtime attendance report.
- Can facilitate the attendance of sub-district employees by using the located-based service method in the attendance coordinate.
- Can provide realtime attendance report information based on *employee classification by utilizing the* JSON Parser system.

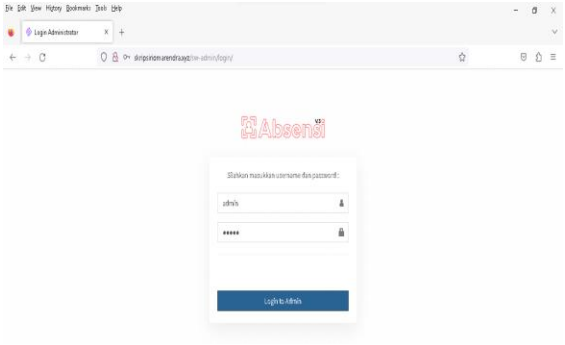

Figure 6. Login view

- Menu Display

Menu display is an administrator dashboard display, as for the menu display can be seen in Figure 7.

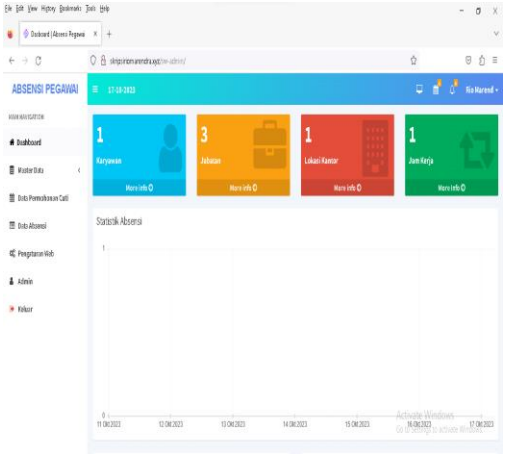

Figure 7. Menu Display

- Attendance Report Display

The attendance report display is an employee attendance report, as for the report display can be seen in Figure 8.

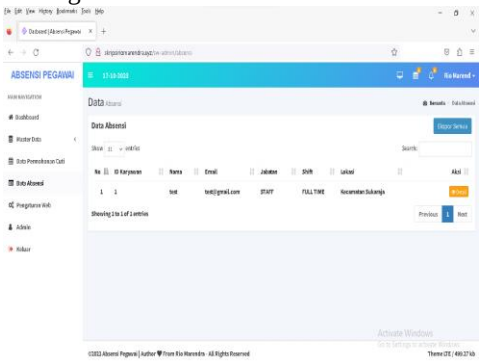

Figure 8. Attendance Report

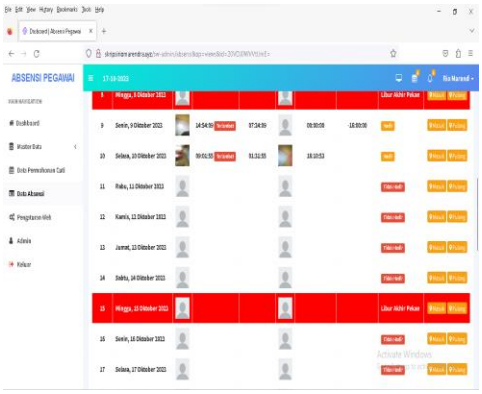

Figure 9. Attendance Detail Report

- Employee Login View

Employee login display is a security system in the application on employee *smartphones*, where there is an *email* and *password* to enter the employee system. The login display can be seen in Figure 10.

Figure 10. Employee Login Display

- Employee Menu Display

Employee menu display is a dashboard display of employees, as for the employee menu display can be seen in Figure 11.

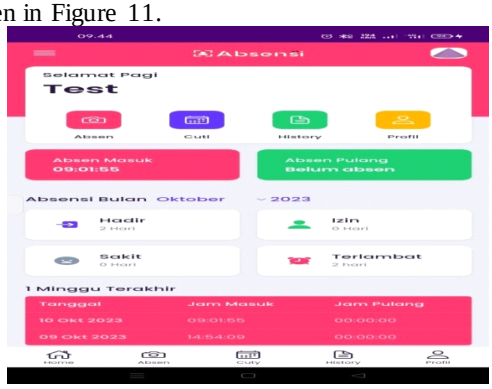

Figure 11. Employee Menu Display

- Employee Absence Display

Employee attendance display is an attendance system by employees, as for the employee attendance display can be seen in Figure 11.

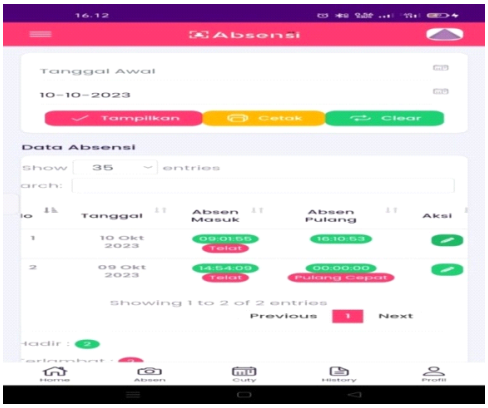

Figure 11. Employee Absence Display

- Employee Absence Menu Display

Employee attendance menu display is an attendance system as for the camera display on employee *smartphones* can be seen in Figure 12.

Figure 11. Employee Absence Menu Display

- Employee Leave Menu Display

The employee leave menu display is a display when employees will apply for leave can be seen in Figure 12.

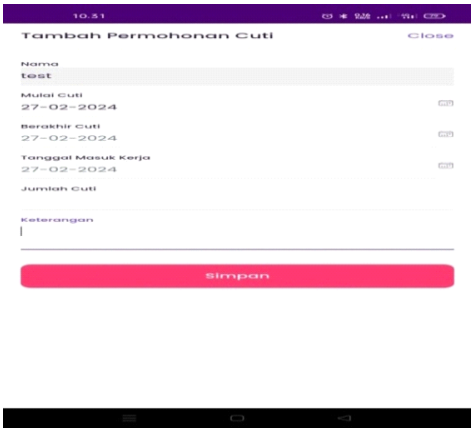

Figure 12. Employee Leave Menu Display

4.2. Testing Results

In testing the development of an employee attendance system using the *located based service method*, *there* are 2 ways, namely:

- *Black Box* Testing

In this test is testing the functionality of the application as opposed to the internal structure or work, as for the function of each menu can be seen in the table below.

Table 1. Blackbox Testing

Tested Menu	Testing Results	Expected Outcome
Splash Display	This display shows the sub-district logo image for 3 seconds	As Expected
Login View	This display is the security system of this application, if the account already has an account and gets an email notification then it can log in.	As Expected
Menu Display	Main menu display, consisting of clocking in menu, clocking out menu, and clocking out menu.	As Expected
Absentee Entry Display	Employee attendance display	As Expected
Return Absence Display	Return attendance display for employees	As Expected

- Questionnaire

This test is to measure all attribute usability by application users, there are 3 tests, namely:

View

Tampilan	Frekuensi Jawaban				
	SB	B	CB	KB	TB
Komposisi Warna	10	4	2	0	0
Kejelasan Teks Yang Ada	11	2	2	1	0
Variasi Tampilan	8	4	2	1	1
Kualitas Tampilan	9	3	1	2	1
Interaktif	10	2	1	1	2
Jumlah frekuensi jawaban	**48**	**15**	**8**	**5**	**4**

Description
Number of Statements :
Very Good (SB) = 48 Statements
Good (B) = 15 Statements
Fair (CB) = 8 Statements
Less Good (KB) = 5 Statements
Not Good (TB) = 4 Statement
Total= 80 Statements

Number of Respondents : 16 Respondents
Calculations
SB = 60%
B = 18,75%
CB = 10%
KB = 6,25%
TB = 5%

User-friendliness

Kemudahan Pengguna	Frekuensi Jawaban				
	SB	B	CB	KB	TB
Tujuan Aplikasi	10	4	2	0	0
Fitur-fitur sistem	11	2	2	1	0
Kecepatan waktu akses sistem	8	4	2	1	1
Kesesuaian hasil informasi dengan kebutuhan pengguna	9	3	1	2	1
Jumlah frekuensi jawaban	**38**	**13**	**7**	**4**	**2**

Description
Number of Statements :
Very Good (SB) = 38 Statements
Good (B) =13 Statements
Fair (CB) =7 Statement
Less Good (KB) = 4 Statement
Not Good (TB) = 2 Statements
Total= 64 Statements

Number of Respondents : 16 Respondents
Calculations
SB = 59,4%
B = 20,3%
CB = 11%
KB = 6,2%
TB = 3,1%

System Performance

Kinerja Sistem	Frekuensi Jawaban				
	SB	B	CB	KB	TB
Kemudahan Menginstall Aplikasi	9	3	1	2	1
Kemudahan Mengoperasikan Aplikasi	11	2	2	1	0
Kemudahan Memahami Informasi yang Diberikan	8	4	2	1	1
Kemudahan Menginstall Aplikasi	10	2	1	1	2
Jumlah frekuensi jawaban	**38**	**11**	**6**	**5**	**4**

Description
Number of Statements :
Very Good (SB) = 38 Statements
Good (B) = 11 Statements
Fair (CB) = 6 Statements
Less Good (KB) = 5 Statements
Not Good (TB) = 4 Statement
Total= 64 Statements

Number of Respondents : 16 Respondents
Calculations
SB = 59,4%
B = 17,1%
CB = 9,4%
KB = 7,9%
TB = 6,2%

V. CONCLUSIONS

The conclusions that can be drawn from the android-based employee attendance system using the *located base service* method at the Air Periukan

District Office are as follows can facilitate the attendance of sub-district employees by using the *located-based service* method on attendance coordinates so that it can display regional location data. Can provide realtime attendance report information based on *employee classification by utilizing the* JSON Parser system. Based on the results of testing the android-based employee attendance system using the *located base service* method at the Air Periukan District Office as expected based on the menu tested. This application uses java programming language and database using realtime attendance report.

From the above conclusions, there are several suggestions in order to use this application program optimally. It is expected that this application is always *up to date* so that this application follows the development of android-based attendance information technology using the *flutter framework*. It is hoped that the development of this application can be a reference not only for the world of government agencies but also for all circles as the development of information technology.

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