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UNIVERSAL ANDROID-BASED ATTENDANCE APPLICATION USING THE GEOFENCE METHOD

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Abstract– Generally, companies usually apply attendance procedures using the fingerprint attendance machine every employee in the office without exception. A common problem that happens is in the marketing of employees who are more than once out of office in 1 day forget to do a presence that can affect salary reduction sanctions. As a solution to the problem, there should bepresence applications using Global Positioning System (GPS) technology and utilizing NFC (Near Field Communication) technology. By using this application, marketing personnel no longer need to perform a presence with fingerprints on the presence machine, but only need to carry a smartphone device equipped with GPS. The app works by recording employee attendance at the office location as an office entry status and recording the status outside of the office when the Marketing force leaves the office. In this system also implements the Geofence method as an indication of the radius in which the user can perform the attendance process

Keywords- Android-Based Attendance, Techonogy NFC, Geofence Method

I. INTRODUCTION

Along with the current development of information technology Computer A tool is absolutely necessary. It is unimaginable how an organization/company can grow and develop without a computer. Therefore, the application of information system becomes an absolute necessity and can provide a competitive advantage. It can be very support in large, medium and small companies in global business competition which is growing rapidly. Attendance system has an important role in the daily life, especially in the schools, universities, factories, hospital offices and other places that need an attendance system. Company management usually apply attendance procedures using the fingerprint attendance machine every employee out in the office without exception. The common problem is in marketing employees who are more than once out of office in 1 day forget to do attendance that can affect the salary deduction sanctions. As a solution to the problem, there must be an attendance application using the technology of Global Positioning System (GPS) and NFC (Near Field Communication) technology. By using this application, marketing personnel no longer need to do attendance with fingerprints on attendance machine, but only need to bring a smartphone device equipped with GPS. The app works by recording employee attendance at the office area location as the office entry status and noting the status of out of office when the Marketing force leaves the office. In this system also applied Geofence method as an indication of radius where user can do attendance process. This research focuses on developing applications that will be able to take attendance in real time (NFC or Scan QR Code), Monitoring of employees and the system will have some limitations System created Android based, Method used method Geofence, The programming language used in this study is PHP, and the processing of databases using MySQL.

II. LITERATURE REVIEW

This chapter will explain in detail about the concepts which are related or will be used in the development of the application 4.1. Location Based Service (LBS). According to Luke T and Daniel P. H (2014), Location Based Service (LBS) refers to the application of that empower

your mobile device's geographic positioning knowledge to provide services. LBS allows services

to identify locations or objects, such as the presence of a person, a bank location, a hospital or a nearby school.

A. Near Field Communication (NFC) NFC or Near Field Communication is

the development of technology based on Radio Frequency Identification (RFID). RFID itself has the same form and function as an ATM card. But of course there are differences if for an ATM transaction to be swiped then the RFID card is only brought closer to the reader. The way NFC works is that the user must have an NFC chip on his own device and attach or flick the device to another device that already has an NFC reader too. The advantages of NFC technology that is connecting with other devices is very easy, just one touch , more secure and comfortable because NFC has a good security system. In addition, there is little possibility for interference when connecting due to using an RFID system, besides the advantages of NFC technology, there are some shortcomings that are not yet many people who know about this technology because it is still relatively new in Indonesia, then for infrastructure is still minimal that supports NFC devices in place - public places especially in Indonesia. Besides that, another weakness is that communication between devices still requires very close distances (Kontu, et al., 2015)

B. QR Code

QR Code is a technique that converts written data into 2-dimensional codes printed into a more concise medium or Code is a 2-dimensional barcode was first introduced by Japanese company Denso-Wave in 1994. This barcode is the first used for invertaris data collection of vehicle parts production and now it is used in various fields. QR stands for Quick Response because it is intended for translated content quickly. Qr Code is the development of one-dimensional barcodes, QR Code is one type of barcode that can be read using a mobile phone camera. Versions of QR code symbols range from Version 1 to Version 40. Each version has a configuration modules or the number of modules (this module refers to the black and white dots form a QR Code). "Module Configuration" refers to the number of modules contained in the symbols, starting with Version 1 (21 x 21 modules) up to Version 40 (177 x 177 modules). Each number the higher version consists of 4 additional modules per side. Each version of the QR Code symbol has a data capacity that corresponds to the amount of data, type of character and error rate correction. For maximum capacity data inspection specified in each version. For the maximum version and data capacity, the amount of data and module will increase so that the QR Code symbol gets bigger. (N. A. Musthofa, S. Mutrofin and M. A. Murtadho, 2016)

III. METHODOLOGY

For the development of this research system using SDLC (Software Development Life Cycle) model. The System Development Life Cycle (SDLC) is the process of creating and modifying systems as well as the models and methodologies used to develop a system.The SDLC model used in this research is the Rapid Application

Development (RAD) model.Rapid Application Development (RAD) Describes a method of software development that greatly emphasizes rapid Prototyping and iterative delivery. Therefore, the RAD model is a keen alternative to the typical waterfall development model, which often focuses on sequential design planning and practice.

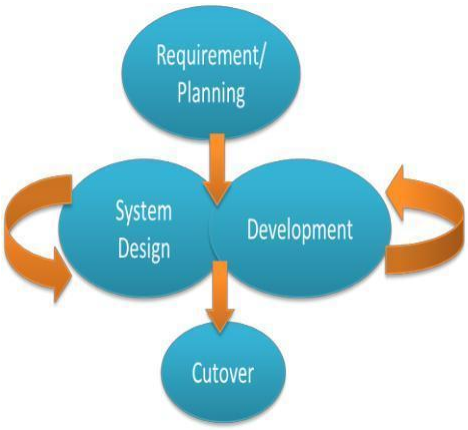

Figure 1 RAD Methodology Life Cycle

The RAD model consists of four major phases:

1. Requirement Planning Phase

   In the initial stage, the buyer meets with the system developer and defining the scope of the system to be was built. In this study the system to be created is a system encyclopedia.

Furthermore, by analyzing the problem and system requirements and solutions. For example, how users add new information and how to order the information desired by the user can be easily found as well user level required in running the system.

IV. DESIGN AND IMPLEMENTATION SYSTEM

A. System Analysis

System Analysis chapter aims to explain the analysis of the program functions and behavior based on the prescribed requirement. This chapter illustrate the application requirements and development procedure in order to identify its goals and purpose. This chapter consists of System Overview, Use Case Diagram, and Swim Lane Diagram

B. System Overview

The research is aimed at creating an Android-based application that can monitor employee attendance in real time and create Android-based applications that can facilitate their employees to perform presence

C. System Use Case

Use Case Diagram is an overview of system user interaction with the system by executing the functions that the system can accept. On this system, there are two user actors, namely admins and users who perform different functions of the system. The form of user interaction to the system can be seen in:

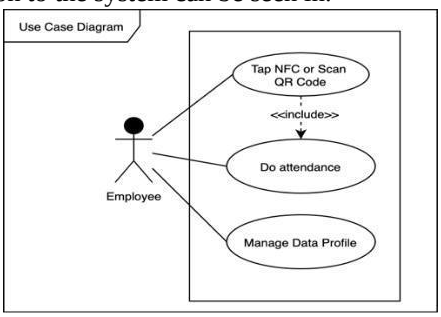

Figure 2. Use Case Diagram – Employee

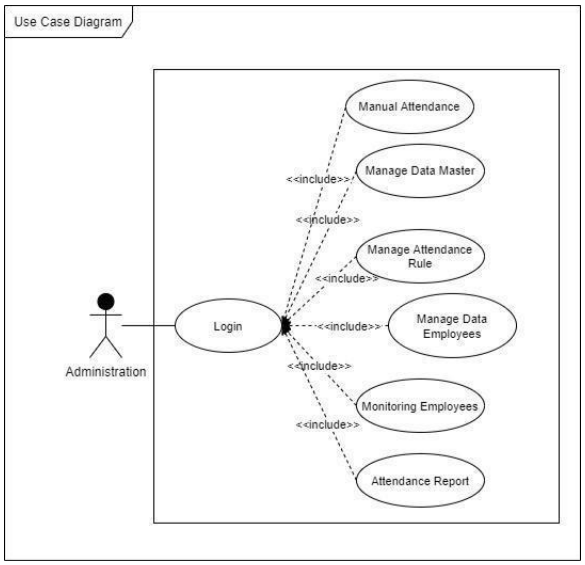

Figure 3. Use Case Diagram Administration

D. Design Database

Databases are an organized set of information so they can be easily accessed, managed. Here is a design database of Universal Android based Attendance Application using the Geofence Method:

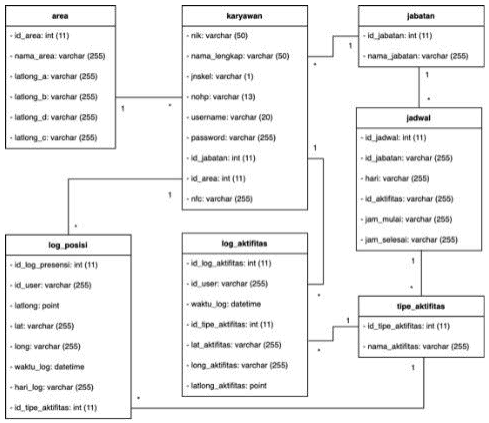

Figure 4. Design Database

V. RESULT

User interface design is one of the most essential components of any application, be it a desktop or a web application. A well-designed user interface will allow users to use the application easily and efficiently, thus resulting in a high productivity.

1. Result System – Employee Attendance

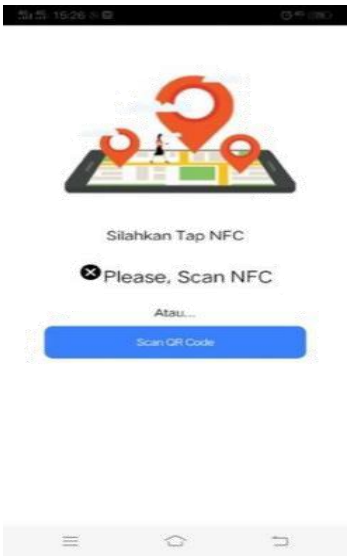

Figure 5. Employee Attendance

2. Result System – Location Employee

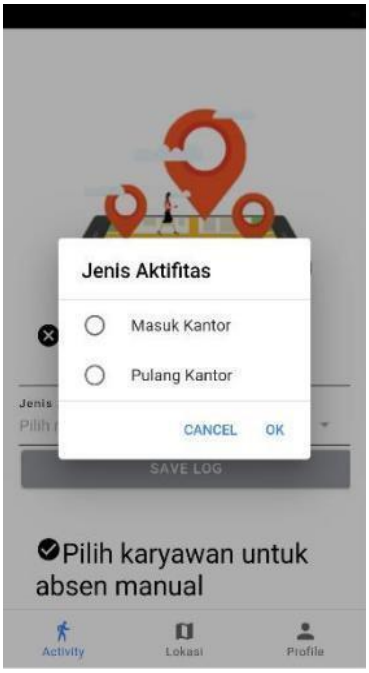

Figure 6. Employee Attendance (Select Activity)

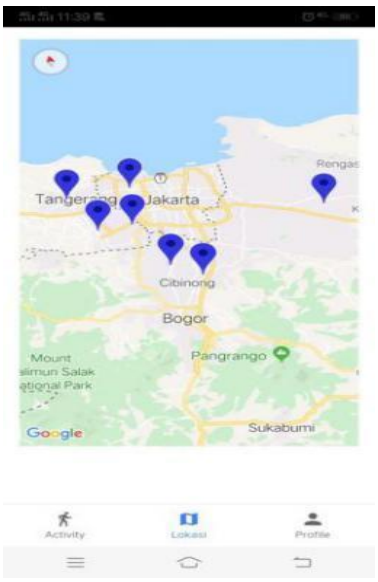

Figure 7. Location Employee

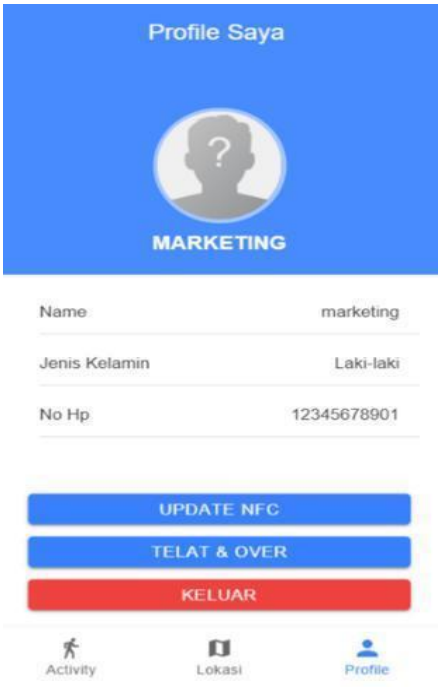

Figure 8. Employee Profile

Figure 9. Request Absen

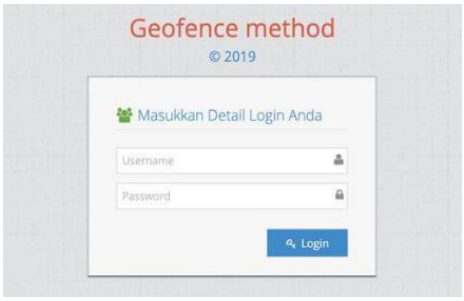

Figure 10. Login Administration

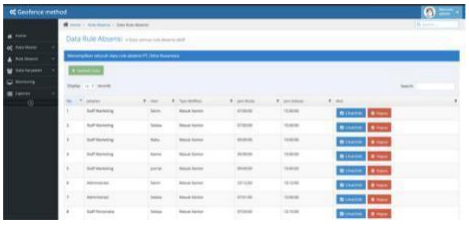

Figure 11. Rule Menu

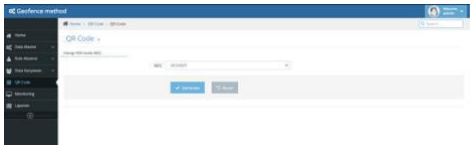

Figure 12. QR Code

Figure 13. Result of QR Code

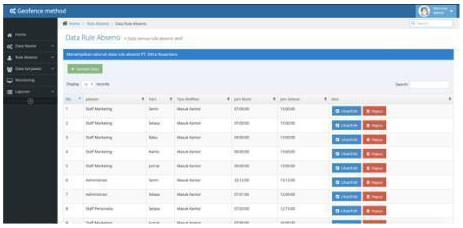

Figure 14. Monitoring Employee

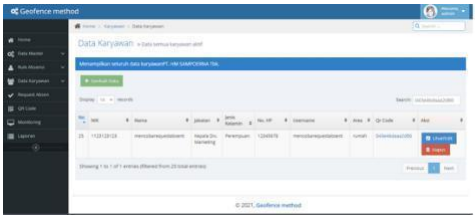

Figure 15. Request Absen

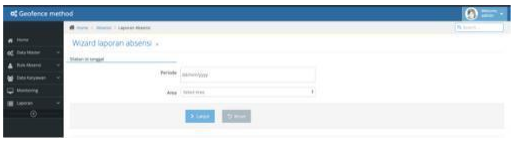

Figure 16. Attendance

VI. CONCLUSION

The conclusions that can be obtained from this thesis project are as follows:

1. Attendance application with Geofance technology method, NFC and QR Code has been running and works well according to the needs of the user
2. The system created can monitor attendance in real time

3. The system made easier for employees to do attendance

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