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Judul :

**Employee Attendance Application Using Location Based Service (LBS) Method Based On
Android**

- Menimbang : 1. Bahwa perlu diadakan pelaksanaan Tridharma Perguruan Tinggi dalam bentuk Penelitian.
2. untuk Keperluan pada butir 1 (satu) diatas, maka perlu dibentuk tugas yang berkaitan dengan penelitian yang dipublikasikan dalam Jurnal Ilmiah.

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Employee attendance application using location based service (lbs) method based on android

Achmad Fatkharrofiqi¹, Herman kuswanto², Taufik Rahman³,
Sumarna⁴, Felix Wuryo Handono⁵, and Hafis Nurdin⁶

^{1,2,4,6}Technical Information, STMIK Nusa Mandiri, Jakarta, Indonesia

^{3,5}Information Systems, Universitas Bina Srana Informatika, Jakarta, Indonesia

E-mail: herman.hko@nusamandiri.ac.id

Abstract. PT. Brainmatics Cipta Informatika is an IT Training and Consulting company located in Jakarta. The development of a company can not be separated from the role of employees in it. The success assessment of existing human resources apart from the aspect of success in the field of work is also inseparable from the assessment of the conditions including the assessment of attendance. Problems that occur at PT. Cipta Cipta Brainmatics is the process of existing employee attendance, attendance is done by using Odoo's web based Enterprise Resource Planning system that stores employee data on coming and outgoing hours that can be accessed anywhere without any location or area restrictions, so employees can do attendance at anywhere, even without having to come to the office. Based on these problems, an Android-based attendance application was designed by utilizing the Location Based Service (LBS) feature that can be operated using a smartphone and can be used with a limited area determined for the attendance process. This application was built with the Java programming language using Android Studio, PostgreSQL and Objecbox software as its database. It is expected that the application that is designed can resolve the attendance issues that exist at PT. Brainmatics Cipta Informatika.

1. Introduction

PT. Brainmatics Cipta Informatika is a private company in Jakarta which is engaged in IT Training and Consulting. Employee attendance at this company is done by using Odoo's web based Enterprise Resource Planning system that stores data on coming and outgoing hours only, without limiting employee access areas when attend, so employees can do attendance anywhere using an internet connection even though they did not come to the office, it made difficult for HRD to control employees in terms of attendance. To overcome the problems, they need to make an attendance application with Location Based Services technology, the best solution is to use an Android-based smartphone using GPS features.

The advantage of a smartphone device in addition to being almost owned by everyone which is easy to carry and not only used as a communication tool[1], is the integrated GPS (Global Positioning System) technology. This GPS can provide an accurate location information for mobile objects[2]. It will make developers easier to utilize the GPS location coordinates geographical values, which is used to develop LBS-based applications, by utilizing location-based services or LBS position of the device used will be detected[3].



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This study using several references relating to the research, namely, research with the title "A Location Based Time and Attendance System", the study is to replace the traditional Identification Card with a mobile application. The application installed on users mobile and store the GPS coordinate and time data values received from the application to the Database[4], another research using LBS as references is The Analysis and Implementation of Location-Based Augmented Reality Mobil Application for Searching Tourist Attractions and Culinary Places in Phnom Penh City, Cambodia which improve the user experience for travelling where the tourist easily to find the attractions and culinary places[5]. In research with the title of "Implementation of Mobile Attendance Application Using Geo-Fence Technique", where the system successfully tested in real situation outside the building and it helps the process of taking staff attendance efficiently when the user is away from office[6]. In a study entitled "A Smart, Location Based Time and Attendance Tracking System using Android Application", in this research, the application using android Smartphone to set the area for tracking employee coordinate using GPS to make sure that the employee is present in the organization[7].

By applying the attendance application using the LBS method, employees who do attendance must be in the office area with a distance of less than 20 meters from the office, even though employees can still open and attend attendance outside a distance of 20 meters but will be considered invalid absenteeism, and are expected to implement it LBS-based absences can make it easier for HRD parties to control whether employees can obey existing attendance regulations and at the same time be able to see the level of discipline of attendance of existing employees[8].

2. Research methods

In this study, the application development method used is the waterfall model, that originally proposed by Winston W. Royce to describe software practically in 1970[9] which part of the model are still applicable today. The stages we used in the waterfall model are as follows:

2.1. Software Requirement

At this stage preparations are made for making applications by gathering requirements related to the design of the application by making Use Case Diagrams, Activity Diagrams, Sequence Diagrams.

2.2. Design

At this design stage, there is a User Interface, Data Model.

2.3. Program Code

The programming language used in making this application is the Java programming language.

2.4. Testing

Testing the application of attendance at PT. This Cipta Cipta Brainmatics by using black-box testing.

2.5. Implementation

Stage where the application is implemented directly and analyzed for future development.

3. Results and Discussion

3.1. Stages of Analysis

This needs analysis aims to make the data needed by PT. Brainmatics Cipta Informatika in accordance with the needs of the application made include:

1. Users can do in and out attendance.

2. Users get notifications before and after office hours.
3. The user can see a list of their attendance.
4. Admin can manage employee data.
5. Admin can recap the PT. Brainmatics Cipta Informatika attendance.
6. Admin can change employee attendance data.
7. Admin can see the attendance list of all users in realtime.

By having the above capabilities, the prototype of this system can be developed, so that will be ready to be implemented and run well based on the hardware and software minimum requirements specifications.

3.1.1. Use Case Diagram The following is the data model proposed to PT. Brainmatics Cipta Informatika, figure 1.

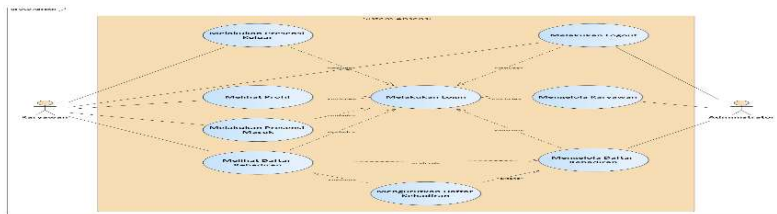


Figure 1. Use Case Attendance System Diagram

3.1.2. Data Model The following is the data model proposed to PT. Brainmatics Cipta Informatika, figure 2.

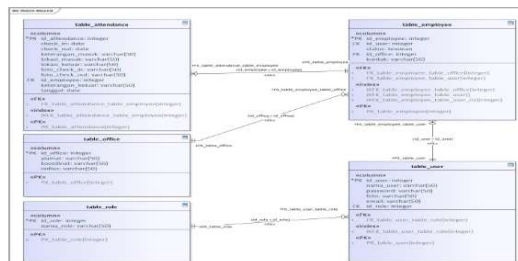


Figure 2. Brainmatics Attendance Data Model

3.1.3. Activity Diagram The following is an activity diagram proposed to PT. Brainmatics Cipta Informatika:

- Attendance-In Activity Diagram, figure 3.
- Attendance-Out Activity Diagram, figure 4.

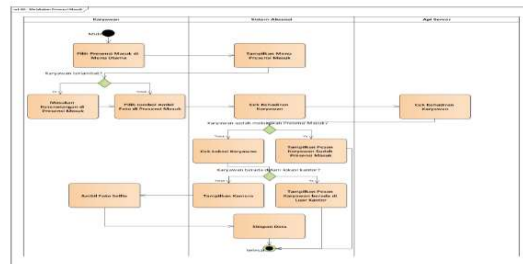


Figure 3. In Attendance-In Activity Diagram

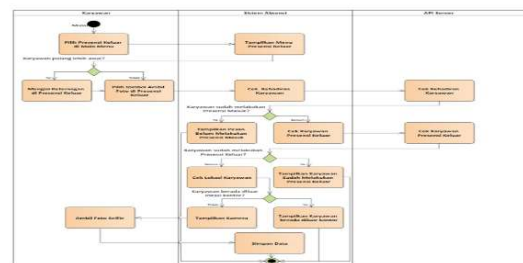


Figure 4. Attendance-Out Activity Diagram

3.1.4. *Sequence Diagram* The following is a sequence diagram proposed to PT. Brainmatics Cipta Informatika :

- Sequence Diagram Perform Attendance-In, figure 5.
- Sequence Diagram Perform Attendance-Out, figure 6.

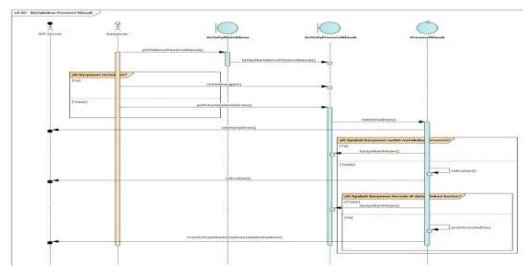


Figure 5. Sequence Diagram perform Attendance-In

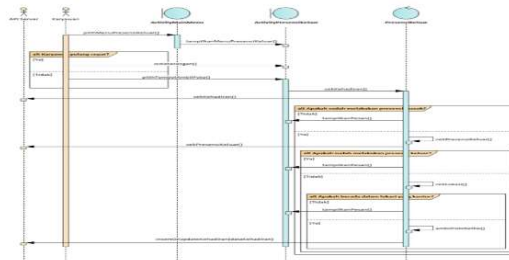


Figure 6. Sequence Diagram perform Attendance-Out

3.2. Implementation

3.2.1. Attendance-In Page Display

Attendance-In Page is the page used by employees to do attendance-in when entering the office (check in), on this page there is also some information including, information on the user's location when doing an attendance-in, current hours, quotes to motivate employees, information fields to give reasons if attendance is late, and The Take Photo button is used to take employee photos at attendance and save attendance in the local database, figure 7.



Figure 7. Attendance-In Page

3.2.2. Attendance-Out Page Display

Attendance-out page is the page used by employees to do an attendance-out (check out), on this page there is also some information including, information on the user's location when doing attendance out, current hours, quotes to motivate employees, information fields to give reasons if go home quickly, and the Take Photo button is used to take employee photos when doing an attendance-out and save in the local database, figure 8.



Figure 8. Attendance-Out Page

4. Conclusion

This paper is to explain the attendance mobil application using Location-Based System for employee at PT. Brainmatics Cipta Informatika to present. The area is set for tracking using GPS so the employee with inside coordinate of the area border depicts is present in the organization. We developed this system for android platform, in future we extend our system for iPhones and other mobile phones.

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