Journal of Technology and Computer (JOTECHCOM)
Vol. 1, No. 4, November 2024, pp. 40~44
ISSN: 3048-0477 (Media Online)

Designing Employee Attendance Application Using Location-Based Service (LBS) Based on Android

Rutmian Mariama Hutasoit[1], Fahmi Ruziq[2], Mayang Mughnyanti[3]
[123]Universitas Battuta, Medan, Indonesia
[123]Fakultas Teknologi, Universitas Battuta, Medan, Indonesia
[1]mariamaruth2408@gmail.com, [2]fahmiruziq89@gmail.com, [3]mayangmughnyanti6614@gmail.com

Article Info

Article history:

Received November 03, 2024
Revised November 04, 2024
Accepted November 04, 2024

Keywords:

Android attendance
Location-based
Haversine formula
RAD method
HR management

ABSTRACT

The rapid growth of information and communication technology in Indonesia has heightened the need for fast, reliable data access, especially for organizations managing large, distributed workforces. This study proposes an Android-based attendance application using Location-Based Service (LBS) to address the limitations of the current web-based HR system at PT Infomedia Solusi Humanika (ISH), a Human Capital Services provider under the Telkom Group. ISH oversees over 28,000 employees across 420 cities, yet the existing system struggles to support attendance tracking for employees at client offices, affecting records such as leave, performance, and payroll. To solve this, an Android application utilizing the Haversine Formula for accurate location mapping within a 100-meter radius allows employees to log attendance remotely. Developed using the Rapid Application Development (RAD) method, the app enables employees to handle attendance, leave requests, and overtime tracking directly through their mobile device, removing the need to access a browser. This solution enhances usability, increases HR efficiency, and ensures accurate performance records, supporting ISH's reputation as a modern HR management provider.

Corresponding Author:

Rutmian Mariama Hutasoit
Universitas Battuta
Email: mariamaruth2408@gmail.com

1. INTRODUCTION

The rapid growth of information and communication technology in Indonesia has created an increasing demand for fast, reliable access to information and communication, especially for agencies and organizations that rely heavily on real-time data. Mobile technology, particularly with the integration of internet-enabled smartphones, provides a valuable solution to meet this demand. Through mobile devices, users can connect, communicate, and share information from virtually any location, providing seamless and flexible access. Operating systems like Android support and enhance these technological advancements, enabling users to fully leverage the potential of mobile communication and information sharing.

Android, a Linux-based operating system, provides an open-source platform that empowers developers to create, adapt, and innovate applications for a wide range of uses. Known for its features in portability and security, Android has become widely adopted across mobile devices. For organizations, this adaptability offers an advantage in various operational tasks, such as managing employee attendance. By leveraging Android applications, companies can streamline administrative tasks, with attendance tracking being a key function for evaluating employee performance and productivity.

One company making strides in utilizing technology to improve HR processes is PT Infomedia Solusi Humanika (ISH), a subsidiary of PT Infomedia Nusantara within the Telkom group. ISH, specializing in Human Capital Services, manages over 28,000 employees across 420 cities in Indonesia. However, the current web-based HRD attendance system has posed challenges, as it does not support employees who are assigned to client offices rather than the head office. This limitation affects essential records such as leave, performance, and payroll, creating an urgent need for a solution that can enable seamless attendance recording across various locations.

To address these issues, ISH has identified a need for an Android-based solution that allows for remote attendance tracking. By implementing location mapping through the Haversine Formula, which calculates precise distances between geographic coordinates, ISH can enable employees working outside the head office to register attendance accurately within a designated radius of 100 meters from client offices. This innovation would allow employees to complete attendance at client locations and avoid delays or inconsistencies in attendance records, which are critical to performance evaluation and payroll accuracy.

An Android-based attendance application, developed using the Rapid Application Development (RAD) methodology, would further enhance the system by streamlining attendance tasks and making them accessible directly through the mobile app. This approach would eliminate the need to open a browser, simplifying the process for employees to log attendance, request absences, and track overtime hours. By making the attendance process faster and more user-friendly, ISH could greatly improve the efficiency of its HR operations and enhance employee convenience, ultimately contributing to more accurate performance assessments and improved organizational productivity.

2. METHOD

Qualitative research is more investigative in nature to produce data that cannot be obtained through statistical procedures. In completing this research, the author requires relatively complete data and information as material that can support the truth of the material description and discussion. Therefore, before this research is carried out, a research is needed so that the author is more directed. In this research, the data collection method used by the author is to use four ways, namely: observation, interviews, literature studies and similar literature studies.

2.1. Observation

Observations were made during February and March 2023 at PT Infomedia Solusi Humanika. Based on the observations made, information was obtained regarding:

a. A brief history of PT Infomedia Solusi Humanika. Contains background regarding the history of its inception, vision and mission.
b. Organizational Structure. Explains the work relationship, authority and responsibility of each part of the agency.
c. Running system or business process. Describes the system or business process that is currently running at the agency in terms of the employee attendance process.

2.2. Interview

In this case, the interview was conducted with Ari Akbar Candra Suradipraja as VP IT Service Management of PT Infomedia Solusi Humanika on February 18, 2019 at the PT Infomedia Solusi Humanika office. There are several questions that the author asks to get the needs needed in the design of this android-based attendance application.

Research Topic
“Designing Employee Attendance Application Using Location Based Service (LBS) Based on Android.”

Related unit name
Rutmian Mariana Hutasoit (researcher)
Ari Akbar Candra suradipraja (VIP IT service management)

Discussion
About business processes, business flow, attendance data and some things that executives should know in attendance at PT Infomedia Solusi Humanika.

Day and Date
Monday, February 13, 2023

Place
PT.Infomedia Solusi Humanika
Jl.T.Amir Hamzah No.3.Sei Agul Medan Barat Medan-20117

Time
10.00-15.00 WIB

Question Draft
a. How is the attendance process for outsourced employees who are spread outside PT Infomedia Solusi Humanika?
b. How many employees are at PT Infomedia Solusi Humanika?
c. What solutions are expected from the existing problems?

2.3. Literature Study

Literature study is carried out by studying theories, books and articles related to sales information systems, analysis and design of information systems, research methodologies, programming. In addition, the author also collects data from internet sites related to the author's research.

Table 1. Literature study

No.	Name	Title	Result	Year
1	Sukerta	Location Based Service Application System for smart city development.	Utilization of Local Based Service for public complaints while directly in the field. The server captures the user's position and the complaint report is received by the admin in the city of Bandung.	2015
2	Tullah	Android application system for sales with Local Based Service (LBS) Based Client Service (LBS)	Utilization of Local Based Service to monitor user position and sales attendance process and data storage using MySQL database at PT. Conbloc Internusa.	2016
3	Effendy	Designing an android-based attendance, leave, and claim system at PT. Kualitas Teknologi Asia.	In the application that has been made, supporting features such as submitting leave and claims online are also formed.	2016

2.4. Testing Phase

In the preparation of this research, the system development method uses Rapid Application Development (RAD) which uses UML tools to describe the use case diagram with Microsoft Visio 2010 software. As explained in the previous chapter, this strategy tries to increase the efficiency and effectiveness of a development of a logistics management information system to be built by combining various simple ideas. Stages of system development methodology with Rapid Application Development (RAD) which is divided into 3 phases, namely: Requirments Planning, RAD Design Workshop, Implementation.

3. RESULTS AND DISCUSSION

The first phase in system design using the RAD method is the Reqruitment planning phase. In this phase, system objectives and information requirements resulting from existing objectives will be identified. In this phase, an analysis of the current system in the organization is carried out, then from the analysis of the current system a solution is made which results in a new proposed system.

After the system design is complete, the next step is to implement the design results. In implementing the system using Android Studio. besides using Sublime Text as text editor software. At the system testing stage, researchers use black-box testing. The testing process is carried out in the form of experimenting and checking the system by running the system. The party who runs the system in the testing process is PT. Infomedia Solusi Humanika This test is displayed in a table based on the menu in the system, namely:

Table 2. Login menu testing

No.	Process design	User	Expected results	Description	Result
1	Input the user ID and Password, click login	All users	-If the user ID and password match, display the main page -If the user ID and password do not match, the system will display the message “error”	Login form and main page	Ok

Table 3. Testing the employee attendance input menu

No.	Process design	User	Expected results	Description	Result
1	Click on the “Attendance” menu	Employee	Display today's employee attendance data in the database	Page to display today's employee attendance data	Ok
2	Click “checkin” for clocking in and click “checkout” for clocking out.	Employee	Take attendance of incoming and outgoing employees that will be entered into the database.	Page to do employee attendance	Ok

4. CONCLUSION

Based on the results of the description and discussion in the previous chapters, it can be concluded that:

a. With this research, employees who work in client offices will find it easier to take attendance because they do not need to go to the head office first but can directly take attendance at the client office.
b. With this research, the attendance process, absence from work due to leave, permission, sickness calculation of overtime at PT Infomedia Solusi Humanika becomes faster and easier because employees can do attendance, apply for leave, permission, overtime and sickness directly through the android application without having to open a browser first.
c. With this android application, it can add to the brand of PT Infomedia Solusi Humanika as a HR management service provider.

REFERENCES

[1] F. Adikara, "Analisis dan Perancangan Sistem Absensi Berbasis Global Positioning System (GPS) Pada Android 4.x," *Seminar Nasional Teknologi Informasi 2013*, Teknik Informatika Universitas Esa Unggul, Jakarta, 2013.
[2] A. Mulyanto, *Sistem Informasi Konsep dan Aplikasi*. Yogyakarta: Pustaka Pelajar, 2009.
[3] M. R. Akbar, "Aplikasi Absensi Karyawan di Konsuil Bogor Menggunakan GPS," Skripsi, Jurusan Sistem Informasi, Fakultas Ilmu Komputer dan Teknologi Informasi, Universitas Gunadarma, Jakarta, 2012.
[4] M. R. Akbar and N. Prabowo, "Aplikasi Absensi Menggunakan Metode Lock GPS dengan Android di PT. PLN(Persero) APP Malang Basecamp Mojokerto," *Majapahit Techno*, vol. 5, no. 2, pp. 55-63, Aug. 2015, ISSN: 2087-9210.
[5] M. David, "Learn More About the Android Studio IDE from Google," [Online]. Available: http://searchsoftwarequality.techtarget.com/feature/Learn-more-about-the-Android-Studio-IDE-from-Google. [Accessed: Jul. 24, 2017].
[6] E. Prahasta, *Sistem Informasi Geografis Konsep-Konsep Dasar (Perspektif Geodesi & Geomatika)*. Bandung: Informatika, 2014.
[7] L. Effendy, W. W. Yunnarlim, and C. G. Kunnardy, "Perancangan Sistem Absensi, Cuti, dan Claim Berbasis Android pada PT. Kualitas Tekhnologi Asia," Skripsi, Teknik Informatika Universitas Bina Nusantara, Jakarta, 2016.
[8] A. Fanggidae and T. Y. Polly, "Sistem Presensi menggunakan IMEI dan GPS Smartphone dengan Data Terenkripsi," *Jnteti*, vol. 5, no. 3, p. 139, Aug. 2016.

[9] J. I. Halim, et al., "Framework Pemetaan Data Berbasis Peta dengan Menggunakan Google Maps API," Skripsi, Universitas Bina Nusantara, Jakarta, 2011.
[10] S. D. Hartono, A. Prijono, and R. S. Fabriano, *Menggunakan Smartphone/PDA Lebih Optimal*. Bandung: Informatika, 2008.
[11] H. Herdi, "Mengenal Arsitektur Android OS," [Online]. Available: https://www.twoh.co/2012/09/18/mengenal-arsitektur-sistem-operasi-android/. [Accessed: Jan. 25, 2017].