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Design and Development of An Employee Attendance Application Using Android-Based Location Based Service at Human Resources Service Company

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Abstract

The purpose of this study is to learn how to create an Android-based location-based service (LBS) application for employee attendance. The author employed four different approaches for gathering data for this study: literature studies, interviews, observation, and similar literature studies. Rapid Application Development (RAD), a system development approach that describes use case diagrams using Microsoft Visio software and UML tools, was employed in the preparation of this study. Requirement planning, RAD design workshop, and implementation are the three stages of the Rapid Application Development (RAD) system development approach. Using Microsoft Visio software to help with diagramming, researchers used UML (Unified Modeling Language) tools to begin creating an Android-based attendance application. It can be inferred from the description and discussion's outcomes that: 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 take attendance directly at the client's office. With this research, the process of absenteeism, absence from work due to leave, permission, sickness, and calculation of overtime at the company becomes faster and easier because employees can do attendance, apply for leave, permission, overtime, and sickness directly via the Android application without having to open a browser first. formerly. With this Android application, it can add to the company's brand as a provider of HR management services.

Keywords: Attendance, Android Based, Location-Based Service, Rapid Application Development, Unified Modeling Language.

1. Introduction

Information and communication technology is developing at an accelerating rate in Indonesia. The public demands quick access to information, and timely and accurate communication is also essential to provide original data, particularly in agency settings. With the use of mobile technology, which is already online, we may obtain access quickly and precisely. Digital technology found in cell phones and smartphones is referred to as mobile technology. Because all users of this technology are integrated with one another, they can share and discuss information with anybody, anywhere, at any time, as long as they have an internet connection. To support the development of information and communication technology, mobile devices are also equipped with a variety of operating systems, such as the Android operating system [1]. Android is a mobile operating system that runs on a variety of devices and is based on Linux. One of the main arguments in favor of adopting the Linux kernel on Android is its proven qualities, which include security, features, and portability. Android itself is open source, or open to developers who want to create and customize applications on their devices [2]. This operating system is not an ordinary operating system because the Android operating system is an ongoing and growing program. By utilizing developments in the Android operating system, every agency or company should be able to increase its performance and productivity and create discipline when working, one of which is attendance [3].

While the word presence is frequently used to refer to the List of Participants or the List of Presence, the word absent is frequently used to refer to the List of Absent, which indicates someone who is not present at a meeting [4]. Previous research explains the design of the attendance application used by employees at Konsuil Bogor by implementing web services and GPS technology as the main alternatives. The application is created with a client-server relationship, where the admin is in full control of the web server and the user, as the client, is addressed to the employee who uses the attendance application [5]. In this research, the use of the geofence method is applied to limit user access areas when carrying out the attendance process. Researchers also used 2D and 3D area restriction calculation methods to determine access distance limits in the agency [6]. Other research was conducted

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to make it easier for users, especially employees at certain companies or agencies, to take attendance remotely. The problems that emerged were taken from several interviews with employees regarding the ineffectiveness of the employee attendance process when going out of town for work [7]. For this reason, this research was created to explain how Android devices can obtain user location data using the GPS tracking method with a GPS provider and a network provider [8]. This location data is in the form of longitude and latitude and is used by staff administrators to monitor the positions of their employees [9]. In this research, data on the position of each office was also recorded into a database in the form of longitude and latitude so that it could be used as a comparison of the distance parameters between the position of the Android user and the position of the office [10].

Android application users can access attendance if they have entered an access area that has been restricted by GPS [11]. In this application, there is Google Maps, which has been created with various access limits so that users can see their own position and can make absentee access if they have entered the access area that is visible on Google Maps [12]. From previous research, the author will develop an attendance system that has been carried out by previous researchers. The author will use a mobile device in the form of a smartphone with the Android operating system to carry out attendance [13]. One of the assessments of employee performance is absenteeism. Currently, there is a web-based HRD system that is already running at the company, but there are problems with attendance [14]. Employees who work outside the company find it difficult to take attendance, thus affecting leave, performance, and even employee salaries. Attendance in the running HRD system can only be used for employees at the head office. Employees who are placed in the client's office have to take attendance at the head office first and then go to the client's office to work, which is very difficult for the employees [15]. Therefore, it is necessary to have location mapping for companies that are affiliated as clients so that employees who work outside the company who are placed in the client's office can take attendance at their company. Attendance at the client's office uses a maximum distance calculation of 100 meters from the employee's coordinate point to the office coordinate point using the Haversine Formula method [16]. Based on this problem, researchers are interested in designing and creating Android-based applications that can solve this problem. If the employee returns to the head office, the employee uses the attendance from the current system [17].

With this Android application, it is also easier, faster, and more effective for employees to carry out attendance, requests not to come to work due to leave, permission, illness, and calculating overtime hours without having to open a browser and enter the website URL address, remembering that attendance is one of the work assessments. What's important is that being a little late can affect the employee's performance and even income [18]. In designing and creating this Android-based attendance application, we used the Rapid Application Development (RAD) system development method because it can speed up the overall system development time. Design is a process that defines something that will be done using various techniques, and it involves a description of the architecture as well as detailed components and limitations that will be experienced in the work process [19]. Design is actually a software engineering activity intended to make major decisions, often of a structural nature. The process of meticulously defining various physically implementable components of an information system is known as system design. Design is a set of steps that convert a system's analysis findings into a programming language so that the implementation of the system's component parts may be explained in detail [20].

A system is characterized as an assemblage of subsystems, parts, or constituents that collaborate to generate a pre-established result. A system can also be thought of as a collection of linked parts that operate as a unit to change data in an orderly fashion and produce output in order to accomplish a common objective. Information is data that has undergone a certain processing step to produce something new or enhanced with insights that the user can understand. These findings, with their new significance, motivate the user to act; from that action, further information about the activity's outcomes will be gathered, which, when subjected to a particular procedure, will yield still more recent data. Information systems are groups of people, information, technology, and work processes arranged to accomplish organizational objectives [21]. An information system can be thought of as a group of interconnected subsystems that have been assembled into a single unit, interact with one another, and cooperate in specific ways between different parts to perform data processing tasks after receiving input in the form of data. data, analyze it, and provide information as a result. This knowledge is then used to make decisions that are practical and have true consequences that can be felt now or in the future. A collection of hardware and software components intended to convert data into meaningful information is called an information system [22].

Each employee's hours of attendance at the company are documented on their attendance card. The employee's attendance record can be kept on file as either a standard attendance list or an attendance card that is automatically completed by a time recording device. It is possible to divide the task of recording time into two main categories: the first is the recording of working time, or attendance time keeping. An employee's monthly meal and transportation allowance will be lowered if they fail to enter their attendance hours on their attendance card. This reduction will also have an impact on the employee's net salary [23]. The purpose of recording attendance time is to gather information about how many hours a person or employee works during a pay period and, occasionally, about the rate at which they are paid for their labor. The goal of working time recording is to document the real working hours that personnel in each position or department put in. These working time logs can be utilized for

detailed computations, attendance verification, and the acquisition of production data required for pay and salary distribution [24].

The technology that determines the location of the gadgets we use is referred to as location-based services, or LBS for short. Location-based services (BLS) are mobile device-accessible information services that operate on a mobile network that leverages the device's location. The goal of the first Geographic Information System (GIS), created in 1960, was to address geographical issues [22]. Forty years later, GIS has advanced beyond its initial use in solving geographic issues and has found application in a number of domains, including the analysis of epidemic diseases (dengue fever) and criminal activity (riots), including tourism. GIS's fundamental function is to combine several database activities, including queries, evaluate them, and present the results as a mapping based on geographic location. This sets GIS apart from other types of information systems. Amidst numerous other operating systems, like Windows Mobile, iPhone, Symbian, and many more, came the development of the Android mobile operating system. But because Android is open source, users and developers can remove essential apps and install third-party ones in their place [25]. This is possible because the Application Program Interface (API) provides access to hardware as well as cellular or system data. The Android operating system was created specifically for mobile devices that run Linux. This operating system was first created by Android Inc., a company that Google eventually purchased.

2. Research Methods

In this research, the data collection methods used by the author are four: observation, interviews, literature studies, and similar literature studies. The system development technique used Rapid Application Development (RAD) to prepare this research. RAD describes use case diagrams using Microsoft Visio 2010 software and UML tools. This technique aims to improve system development's efficacy and efficiency, as it was described in the preceding chapter. information about logistics management that will be created by fusing several straightforward concepts. Three steps make up the Rapid Application Development (RAD) system development technique stages: requirements planning, RAD design workshop, and implementation. Identifying the goal of the application or system and focusing on finding solutions to business challenges are two of the stages taken in this stage of developing an attendance application using an Android-based location-based service (LBS). The Rapid Application Development (RAD) design workshop is a workshop-style process for designing and improving. Users react to functioning prototypes during the RAD design workshop, and analyzers improve the designed modules in response to user feedback.

In the design process, researchers started designing an Android-based attendance application using UML (Unified Modeling Language) tools assisted by Microsoft Visio software to draw diagrams. At the process design stage, the tools use UML (Unified Modeling Language) diagrams, assisted by Microsoft Visio software to describe the diagrams. In database design, the author designs a database that will be used in an Android-based attendance application using potential objects and class diagrams with mapping class diagrams, which are useful for optimizing the database. Followed by creating a matrix table (CRUD). Ends with a database schema to determine database specifications. In this database design, the author used Microsoft Visio software to create database schemas, class diagrams, and mapping class diagrams. At the interface design stage, the author designed the interface and menu structure to suit user needs so that this Android-based attendance application information system can be used optimally by its users. In this interface design, the author uses Microsoft Visio software to describe the layout design and menu structure design in an Android-based attendance application. The implementation stage is where the system begins to be built and refined.

3. Results and Discussion

The first phase in system design using the RAD method is the requirement 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, and from the analysis of the current system, a solution is created, which produces a new proposed system. Based on the results of the running system contained in the website application, it can be explained that: Employees go to the head office to take attendance. After that, employees go to the client or branch office to work. If the data has been entered, HRD staff at the head office can manage the attendance. Next, the HRD manager can see employee attendance. To carry out absences from work due to permission, leave, or illness, along with overtime calculations. Employees input data via the form provided. HRD staff and HRD managers at the head office can manage and view data on absences from work due to permission, leave, and illness, along with overtime calculations. The weakness of this running system is that employees have to go to the head office first to do attendance, which is very difficult for employees who work in client or branch offices. Based on the weaknesses in the system that have been analyzed in the running system by the researcher, the researcher proposes creating an Android application to solve the problems found in the website application with the following proposed system: Employees can make attendance at the client's place and can work

directly at the client's place without having to go to the head office first. Then all activities on the mobile application will be integrated with the web-based HRD system that is already running.

The Android-based attendance application process is described using a Unified Model Language (UML) diagram consisting of use case diagrams, activity diagrams, sequence diagrams, and class diagrams: Employees are people who will do attendance, leave, permission, sick leave, and overtime outside the company. Supervisors, as superiors where employees work, have the task of controlling the absence of working employees, including approval of leave, permits, sick leave, and overtime. HRD staff are people in the head office who are tasked with managing employee attendance, leave, permission, sick leave, and overtime data. HRD Manager is a person at the head office whose job it is to manage company data and view data on employee attendance, leave, permission, sickness, and overtime. Admin is the person responsible for administrative data such as new employee registration. After identifying the actors involved, use cases were identified to determine the activities in this Android-based attendance application. All actors who enter the system must enter the appropriate user ID and password to be able to access the system according to the actor's position. If the user enters the user ID and password incorrectly, an error message will be displayed, and they will be returned to the login page. User data management activities by the administrator. Admins can choose actions as desired, such as adding, editing, and deleting user data. Company data management activities by the HRD manager. The HRD manager can choose actions as desired, such as adding, editing, and deleting the HRD manager's company data. employee attendance data input activities by employees. Employees have actions to add employee attendance data. Employee leave data input activities by employees. Employees have actions to add employee leave data, employee permission data input activities by employees. Employees have the option of adding employee permission data. Employees have actions to add employee illness data. activity of approving employee illness data by the supervisor. Supervisors have the ability to edit employee sickness, permission, and leave data. Supervisors have the ability to edit employee overtime data.

In this step, the researcher compiles a list of potential employee attendance application objects using Android-based Location-Based Service (LBS), which will later be selected to be made into a class. The following is a potential object list for employee attendance applications using Android-based Location-Based Service (LBS). Based on the list of potential objects compiled, the researcher carried out a selection in order to obtain proposed potential objects as material for making class diagrams. After the selection was carried out, the researcher obtained a list of potential proposed objects for an employee attendance application using Android-based Location Based Service (LBS). Class diagrams describe a collection of objects that make up the system and the relationships between the object classes that exist in this medical record information system. Mapping cardinality is used to optimize the database produced in the previous stage. In this stage, the face-to-face display (interface) of the Android-based attendance application for the company that will be built will be designed. This interface design will be divided into several pages according to the duties and authorities of the actors in this system, including the employee page, supervisor page, admin page, HRD staff page, and HRD manager page. Login page interface design every user who wants to access this Android-based attendance application must log in on this page. And after the user logs in, the system will direct the user according to the user's level. This attendance page interface design describes the process of employees taking attendance, where there is check-in and check-out. Check-in is attendance when the employee enters the office, and check-out is attendance when the employee goes home. This attendance page interface design describes the process of viewing attendance data that has been carried out by employees. The interface design for this leave data page describes the process of viewing leave data that has been taken by employees. The interface design for the add leave data page describes the process of adding leave data carried out by employees.

The interface design for this permission data page describes the process of viewing permission data carried out by employees. The interface design for the add permission data page describes the process of adding permission data carried out by employees. The interface design for this sick data page describes the process of viewing sick data carried out by employees. The interface design for the add sick data page describes the process of adding sick data carried out by employees. This leave data approval interface design describes the process of approving leave data for supervisors from leave data that has been carried out by employees. This permit data approval interface design describes the process of approving permit data for supervisors from permit data that has been carried out by employees. The design of the approve sick data interface describes the process of approving sick data for supervisors from sick data that has been carried out by employees. The interface design for the attendance data management page describes the process of creating, reading, updating, and deleting user data for the admin. The interface design for the company data management page describes the process of creating, reading, updating, and deleting company data for HR managers. The interface design for the employee attendance report page describes the process of viewing employee attendance reports for HRD managers, HRD staff, and supervisors. This chat room page interface design describes the message input process for HR staff, employees, and supervisors. The login page interface design for this web-based HRD system describes the login process for admins, HR staff, and HR managers at the head office. The interface design for the attendance data management page in this web-based HRD system describes the process of creating, reading, updating, and deleting attendance data for HRD staff at

the head office. The interface design for the assignment letter input page in this web-based HRD system describes the assignment letter input for HRD staff at the head office.
After the system design is complete, the next stage is to implement the results of the design. In implementing the system using Android Studio. Apart from that, use sublime text as text editor software. At this programming stage, the hardware and software specifications used are as follows: At this programming stage, the hardware and software specifications used are as follows: First, the hardware is a 2011 Macbook Pro, 8GB RAM, 500GB SSD, and Processor second generation Intel Core i7 2nd, software, namely Mac OS High Sierra, Android Studio, Microsoft Visio 2007, Jelly Bean version 4.3, 1 GB of RAM, 20 MB of storage, and a Snapdragon 200 processor. To find out that the Haversine formula can calculate the distance between two points on the earth's surface, it is necessary to do a trial. From the distance calculation using the haversine method above, the distance from the employee's coordinate point to the employee's office, namely at the company, is 11.6 m. Employees who can take attendance are employees who take attendance less than 100m using the haversine method, so you can be sure that their attendance is successful and their attendance can be entered into the database. At the system testing stage, researchers used black-box testing. The testing process carried out is in the form of experiments and checking the system by running the system. The party running the system in the testing process is the company. This testing is displayed in a table based on the menu in the system.

4. Conclusion

Based on the results of the description and discussion, it can be concluded that: 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 take attendance directly at the client's office. With this research, the process of absenteeism, absence from work due to leave, permission, sickness, and calculation of overtime at the company becomes faster and easier because employees can do attendance, apply for leave, permission, overtime, and sickness directly via the Android application without having to open a browser first. formerly. With this Android application, it can add to the company's brand as a provider of HR management services. For further development of this research, several suggestions can be drawn, as follows: Further research indicates that this application can be further developed by creating features for employee payroll. Add an automatic HRD manager signature to employee attendance reports.

References

[1] Akbar, M.R & Prabowo, N, "Attendance Application Using GPS Lock Method with Android at PT. PLN (Persero) APP Malang Basecamp Mojokerto, *Majapahit Techno*, vol. 5, no. 2, 55-63, 2015.

[2] Hamid, N., Riyadi, S., Munizu, M., Usmia, S., & Ali, H. (2023). The Effect of Employee Training, Organizational Commitment and Self Efficacy on Employee Performance in the Hospitality Industry. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(3), 692-696.

[3] Utomo, S. B. (2023). Pemanfaatan Digital Marketing dalam Memperkenalkan Kawasan Wisata Jalan Tunjungan di Surabaya. *Indo-Fintech Intellectuals: Journal of Economics and Business*, *3*(2), 449-458.

[4] Senoaji, F., Tannady, H., Darmo, I. S., Sutrisno, S., & Sonani, N. (2023). Analisis Peningkatan Produk Laptop Melalui Brand Attitude Dan Brand Credibility. *Journal of Economic, Bussines and Accounting (COSTING)*, *6*(2), 1320-1330.

[5] Novita, D., & Senoaji, F. (2022). Peran Merek dan Packing dalam Penjualan Keripik Pisang Kekinian di Surabaya. *Jurnal Pengabdian kepada Masyarakat dan aplikasi Teknologi (Adipati)*, *1*(1), 30-36.

[6] Senoaji, F., & Sari, R. M. (2023). PEMBERDAYAAN MASYARAKAT DALAM MENAMBAH NILAI EKONOMI WARGA DESA BURNO LUMAJANG. *Community Development Journal: Jurnal Pengabdian Masyarakat*, *4*(2), 4227-4234.

[7] Setyawati, K., Ausat, A. M. A., Kristanti, D., Setiadi, B., & Astuti, E. D. (2023). The Role of Commitment, Work Ethos and Competence on Employee Performance in Sharia Commercial Bank. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(2), 523-529.

[8] Solehati, A., Mustafa, F., Hendrayani, E., Setyawati, K., Kusnadi, I. H., Suyoto, Y. T., & Tannady, H. (2022). Analisis Pengaruh Store Atmosphere dan Service Quality Terhadap Brand Preference (Studi Kasus Pelanggan Gerai Ritel Kopi di DKI Jakarta). *Jurnal Kewarganegaraan*, *6*(2), 5146-5147.

[9] Amelia, H., & Setyawati, K. (2023). Analisis Peningkatan Kinerja Pegawai Negeri Sipil pada Kelurahan Bidara Cina Kota Administrasi Jakarta Timur. *PANDITA: Interdisciplinary Journal of Public Affairs*, *6*(2), 106-120.

[10] Setyawati, K. (2023). The Influence of Organizational Culture, Leadership, and Motivation on Performance of Early Childhood School Teachers. *Journal of Childhood Development*, *3*(1), 39-46.

[11] Marjoni, M. R., & Zulfisa, A. (2017). Antioxidant activity of methanol extract/fractions of senggani leaves (Melastoma candidum D. Don). *Pharm Anal Acta*, *8*(8), 1-6.

[12] Marjoni, M. R., Afrinaldi, A., & Novita, A. D. (2015). Kandungan total fenol dan aktivitas antioksidan ekstrak air daun kersen (Muntingia calabura L.). *Jurnal Kedokteran Yarsi*, *23*(3), 187-196.

[13] Alfalah, N. J., Hasni, D., & Febrianto, B. Y. (2022). Hubungan Obesitas dengan Kejadian Hipertensi pada Perempuan Minangkabau. *Poltekita: Jurnal Ilmu Kesehatan*, *15*(4), 360-364.
[14] Negara, M. E. P., Triansyah, I., Hasni, D., & Febrianto, B. Y. (2022). Hubungan Intensitas Penggunaan Earphone dengan Derajat Gangguan Pendengaran pada Mahasiswa Fakultas Kedokteran Universitas Baiturrahmah. *Scientific Journal*, *1*(3), 229-236.
[15] Setiawan, P. B. A., Vani, A. T., Febrianto, B. Y., & Septiana, V. T. (2020). The Effectiveness of Using Aloe Vera Facial Soap and Aloe Gel on the Degree of Acne Vulgaris in Students of SMA Negeri 2 Bayang. *Jurnal EduHealth*, *11*(1), 39-47.
[16] Abdullah, D., Febrianto, B. Y., Dewi, N. P., Vani, A. T., & Ulfah, F. C. (2022). The Effectiveness of 80% Kefir Gel Against The Overview The Number of Fibroblasts in Healing Cuts Mice (Mus Musculus). *Jurnal Kesehatan Prima*, *16*(1), 18-24.
[17] L. Whitten, Jeffrey, & D. Bentley, "*System Analysis & Design Methods Seventh Edition*," New York, USA: McGraw-Hill, 2017.
[18] Syahribulan, S., & Rosmiati, R. (2022). Application of Business Model Canvas (BMC) in could help students develop a more entrepreneurial mindset. *Economy Deposit Journal (E-DJ)*, *4*(1), 232-240.
[19] Ramadi, R, "Application of Knowledge Management System in Automotive Companies: Case Study of PT. Astrido Jaya Mobilindo," *Jurnal SIMETRIS*, Vol. 7, 2016.
[20] Rostini, R., Purwanto, J., & Syahribulan, S. (2020). The Influence Of Emotional Intelligence And Organizational Commitment To The Performance Of Mori Same Cooperation Of Mori Sama Gowa. *Economy Deposit Journal (E-DJ)*, *2*(1), 66-74.
[21] Utomo, S. B., Jamali, H., Arief, I., Saputra, M. N., & Priambodo, C. G. (2023). Analysis of The Influence of Hedonic Digital Lifestyle on Consumptive E-Shopping Behavior of Generation Z Through E-Commerce Applications. *Jurnal Sistim Informasi dan Teknologi*, 85-91.
[22] Utomo, S. B., Suharmono, S., Nathanael, G. K., Mahmudin, T., & Wahyono, T. T. (2023). CULTURAL IDENTITY AS TOURISM BRANDING FOR EAST JAVA PROVINCE IN INSTAGRAM CONTENT@ DISBUDPARJATIMPROV. *JURNAL ILMIAH EDUNOMIKA*, *8*(1).
[23] Tannady, H., Susmantoro, T. D., & Hendra, T. (2023). The Application of Exponential Comparison Method and Analytical Hierarchy Process to Analyze Supply Chain Performance. *Jurnal Sistim Informasi dan Teknologi*, 58-62.
[24] Sukerta, A., Linawati, & Wirastuti, D.N, "Location Based Service Application System for Smart City Development," *Jurnal Teknologi Elektro*, vol. 14, no. 1, pp. 21-26, 2015.
[25] Tullah, R., Tobing, T.A.F., & Hadi, A, "Android Application System for Sales with Client-Server Local Based Service (LBS)," *Jurnal Sisfotek Global*, vol. 5, no. 2, 2016.