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Location Based Employee Attendance App with WFA Support and Real Time Location Monitoring

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Abstract

The attendance system is an important component in supporting the operational effectiveness of institutions, including the Mentari Meraki Asa Foundation (YMMA), which has a decentralized and dynamic work pattern. This study aims to develop a location-based employee attendance system with Work From Anywhere (WFA) features and real-time location monitoring. The system was designed using the Fishbone Diagram approach to analyze the root causes of problems and developed using web and Android-based technologies. The design process included identifying system requirements, implementing geofencing and GPS technologies for location validation, and establishing multi-layer authentication through additional verification for attendance outside the main location. Real-time location monitoring was implemented to enhance the accuracy of attendance data. The system was tested through functionality testing, location accuracy testing, and user experience testing. The results showed that the developed attendance system is capable of accurately recording attendance, supporting employee mobility, and improving operational efficiency. This research contributes to the development of modern attendance systems that are adaptive to flexible work patterns and can be implemented as a reference for future attendance system development.

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1. Introduction

Computer technology has grown so rapidly that it requires every individual, including institutions, to utilize these developments to facilitate their performance. Amidst this dynamic, employee attendance management has become a crucial aspect supporting company operational effectiveness. Recording employee attendance is a key component that ensures the continuity of work processes. However, traditional attendance methods, such as manual recording or time cards, have several significant weaknesses. These methods are prone to recording errors, limited flexibility, and unable to adapt to the ever-changing needs of the institution (Adit Hernowo & Tri Ginanjar Laksana, 2024).

Attendance is a crucial component in supporting the operational effectiveness of an institution. A high-quality attendance system is expected to produce accurate and optimal data, in accordance with predetermined targets. Employee attendance records, whether in the form of manual attendance lists or using cards on time-recording machines, serve as important documents that record

the arrival and departure times of employees at a particular company or institution. Along with technological developments, time and attendance systems have also undergone significant innovation with the advent of devices such as computers and other supporting technologies. Attendance systems now rely less on manual methods and have also adopted modern technologies, such as paper, computers, fingerprint scanners, eye scanners, and even Android-based devices. These technological advances have made it easier for many companies and institutions to update their attendance systems, making them more flexible and efficient. With this technology, attendance can be conducted from anywhere, reducing wasted time and increasing productivity (Ade & Samsudin, 2024).

With the development of flexible work concepts such as Work From Anywhere (WFA), the need for modern, flexible, and efficient attendance systems has become increasingly important (Ridwansyah et al., 2022). Attendance systems now rely less on manual methods and have adopted modern technologies such as computers, fingerprint scanners, eye scanners, and Android-based devices. This technology allows for automated and more accurate attendance recording. With technological advancements, many organizations have switched to web-based digital attendance systems, which not only increase flexibility but also improve the efficiency of time and attendance recording. This system allows for more optimal management of previously manual attendance (Ade & Samsudin, 2024).

However, several weaknesses remain in the implementation of fingerprint-based attendance technology. One major drawback is the emergence of long queues when many employees want to check in simultaneously. Furthermore, if the fingerprint device experiences problems, the attendance process can be slower, ultimately hampering work efficiency. This challenge is even more pronounced in the era of flexible work, where employee mobility often cannot be supported by conventional attendance systems. To address this issue, geolocation and geofencing technology are relevant solutions. Geolocation allows the system to detect a device's location based on GPS, cell towers, Wi-Fi hotspots, or a combination of the three. This technology can be implemented on both mobile and desktop devices, providing flexibility in attendance management (Wardhana et al., 2022).

Geofencing, an extension of geolocation technology, utilizes the Global Positioning System (GPS) or Radio Frequency Identification (RFID) to establish virtual geographic boundaries. This system allows for automatic attendance recording only within predetermined areas (Niklas et al., 2024). By integrating geofencing technology, organizations can improve the accuracy of attendance data while maintaining the validity of attendance reports. Furthermore, a modern attendance system that supports the WFA work pattern can also increase employee job satisfaction by providing flexibility and convenience in carrying out tasks. Previous research has shown that adopting this technology not only simplifies the attendance process but also reduces the risk of recording errors and increases overall productivity (Aulia Asri Choirinisa & Khairul Ikhwan, 2022).

The Mentari Meraki Asa Foundation (YMMA) is an NGO (Non-Governmental Organization) that acts as an NGO in the fields of health, education, and community empowerment, particularly in efforts to combat tuberculosis (TB) in North Sumatra. The foundation's programs encompass a variety of dynamic activities, such as supervision, audits, oversight, and providing material for meetings with Other NGOs or related parties in TB control.

In its operations, foundation employees have various responsibilities, including supervising quarterly and semi-annual performance evaluations, auditing the finance team to ensure expenditures are in accordance with regulations, and providing material as resource persons in meetings with other NGOs or related parties. Most employees work flexibly, either in the office, in the field, or from home, depending on the foundation's operational needs. This decentralized work pattern presents challenges in managing employee attendance, particularly regarding data accuracy and operational efficiency. Traditional attendance systems, such as manual attendance, are no longer relevant to the foundation's highly mobile needs. Therefore, a digital attendance system is needed that can record attendance in real time, support Work From Anywhere (WFA), and ensure transparency and efficiency in employee attendance management.

Therefore, a modern web-based and Android-based attendance system is needed that supports real-time attendance recording by utilizing location monitoring technology. This system is designed to support work flexibility through the Work From Anywhere (WFA) feature, which allows employees to report their attendance from their respective work locations, whether in the field, at home, or in the office. With GPS integration for location validation, this system also ensures the accuracy and validity of attendance data. In addition to supporting employee mobility, this system is expected to improve the foundation's operational efficiency and provide a better work experience for employees.

2. Research Methodolgy

This study uses the fishbone diagram method as a basis for designing and developing a location-based employee attendance application system with real-time Work From Anywhere (WFA) support for web and Android. The fishbone diagram is used as an analytical tool to identify and map various factors causing attendance problems that occur at the Mentari Meraki Asa Foundation (YMMA). This method makes it easier for researchers to group the root causes of problems and determine solutions systematically according to the stages of system development.

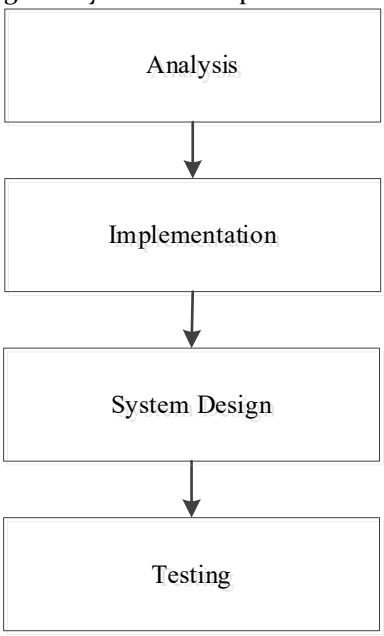

Figure 1. Design Procedure

This diagram illustrates the key steps in designing a location-based employee attendance system supported by the Work From Anywhere (WFA) feature, from requirements analysis, system design, code development, testing, and evaluation. Each stage plays a crucial role in ensuring the system runs optimally, accurately, and meets the needs of the Mentari Meraki Asa Foundation (YMMA). The following is a further explanation of each stage shown in the diagram.

1. Analysis Stage (Requirements Analysis)
   This stage aims to identify and analyze system requirements based on the problems encountered in employee attendance recording at YMMA. The analysis is conducted by:
   a. Reviewing the current manual attendance system and identifying its shortcomings.
   b. Collecting data related to user needs for a more efficient location-based attendance system.
   c. Analyzing the concept of geofencing and its implementation in an attendance system that can support the Work From Anywhere (WFA) feature.
   d. Identifying the security and accuracy aspects of location-based attendance recording.

2. System Design Stage

After the requirements analysis is complete, the system design process includes:

a. System architecture design involving web-based and Android technologies.
b. Database design to store attendance, location, and employee data integrated into the system.
c. User interface (UI/UX) design to ensure the system is easy to use and provides an optimal user experience.
d. Geofencing system logic design, which defines attendance location boundaries and validation mechanisms if the WFA feature is activated.
e. User authentication scenario development, to ensure that only registered employees can take attendance.

3. Implementation Stage (Implementation & Coding)

At this stage, the system begins to be developed by implementing the previously created designs. The implementation process includes:

a. Development of a geolocation-based attendance recording feature, which ensures that employees can only take attendance at predetermined locations.
b. Integration of the Work From Anywhere (WFA) feature, which allows attendance to be taken outside the geofencing radius with additional validation.
c. Implementation of real-time location monitoring technology to improve the accuracy and transparency of attendance recording.
d. Development of security features, such as location data encryption and token-based user authentication.
e. Initial testing of each developed component before entering the full testing phase.

4. Testing & Evaluation Phase

After implementation is complete, testing is conducted to ensure the system runs according to the designed specifications. Testing includes:

a. System functionality testing, to ensure all features work properly, including attendance recording, location validation, and the Work From Anywhere (WFA) feature.
b. Geofencing accuracy testing, to ensure the system can accurately detect user locations within a specified radius.
c. Data security testing, to ensure employee attendance and location information is stored securely and cannot be manipulated.
d. System performance evaluation, to test the efficiency of device resource usage and application response speed.
e. At this stage, the author conducted testing using the Blackbox Testing method, which focuses on system functionality without examining the internal structure of the program code. This testing was conducted to ensure that the prototype developed can run properly and meet its intended purpose under actual use conditions.

5. Results

At this stage, conclusions were drawn from the design and development process of a location-based employee attendance system with support for the Work From Anywhere (WFA) feature and real-time location monitoring. This research was conducted using a Fishbone diagram approach structured according to the system development stages, from requirements analysis to initial implementation in the form of a prototype simulated in the operational environment at the Mentari Meraki Asa Foundation (YMMA). Test results showed that the system successfully integrated geofencing features, GPS-based location tracking, off-site attendance validation with additional verification, and user authentication-based data security. The system was able to accurately record attendance and support flexible work for highly mobile employees. However, limited testing revealed that location accuracy under weak GPS signal conditions and the manual validation process for WFA still require improvement to accelerate system response.

3. Results and Discussion

3.1. Discussion

This research aims to design and develop a location-based employee attendance application equipped with a Work From Anywhere (WFA) feature and real-time location monitoring capabilities. The Mentari Meraki Asa Foundation is an institution focused on tuberculosis (TB) control in North Sumatra. In carrying out its activities, foundation employees have flexible and dynamic work patterns, spanning various locations such as offices, fields, and other designated work sites. However, the attendance system used is still manual, resulting in inaccurate attendance recording and difficult real-time monitoring. Furthermore, foundation employees have duties that are not always centralized in one location, such as supervising quarterly and semi-annual performance evaluations, auditing the finance team to ensure expenditures are in accordance with regulations, and providing materials for meetings with other NGOs or related parties related to TB control.

One of the main challenges faced is the lack of accuracy and validity of attendance data. The high mobility of employees often makes it difficult for managers to ensure their attendance at the appropriate work location. The manual system is prone to recording errors, such as data manipulation or absenteeism, which can impact employee performance evaluations and the foundation's operational effectiveness. Therefore, a technology-based attendance mechanism is needed to ensure more valid and accurate attendance recording.

Furthermore, the difficulty of monitoring employee presence in real time hinders managers in allocating tasks efficiently. Unintegrated attendance systems require additional time and resources to collect, validate, and analyze attendance data. These limitations not only slow decision-making but also impact the smooth operation of the institution as a whole. The following is a design of the Use Case Diagram of the system to be designed, which can be seen in the attached image:

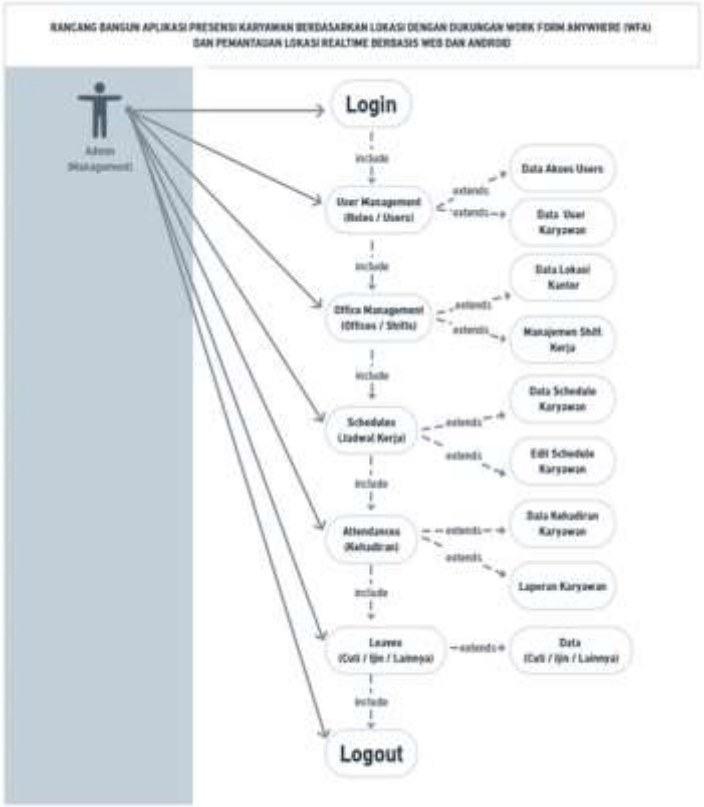

Figure 2. Use Case Diagram (Administrator Actor)

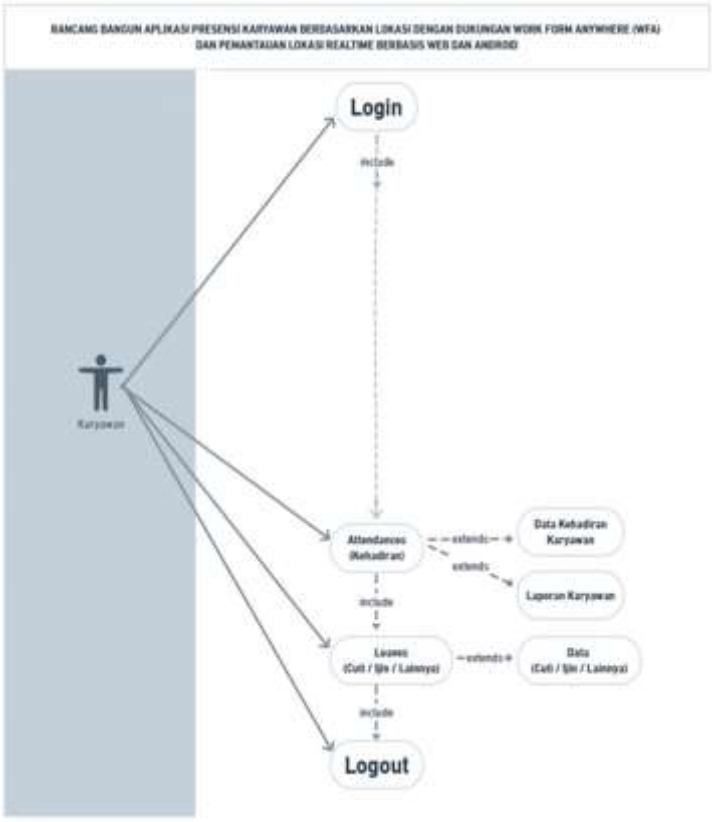

Figure 3. Use Case Diagram (Employee Actor)

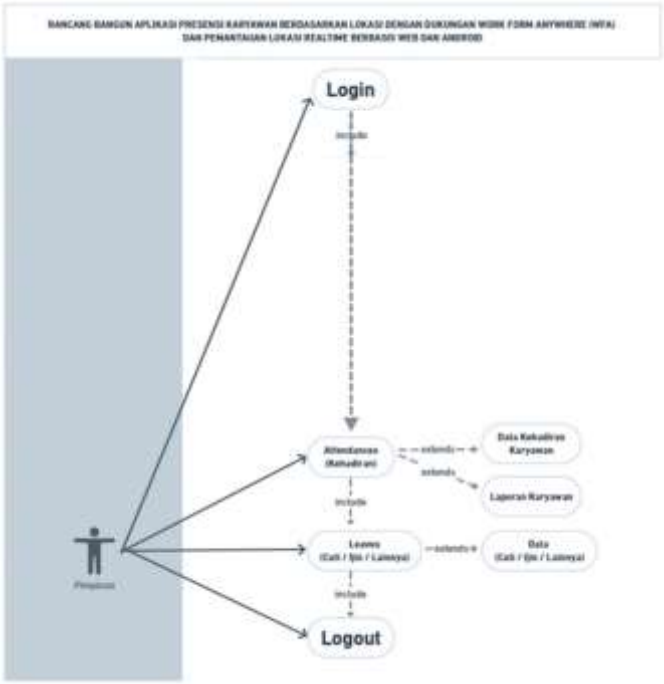

Figure 4. Use Case Diagram (Lead Actor)

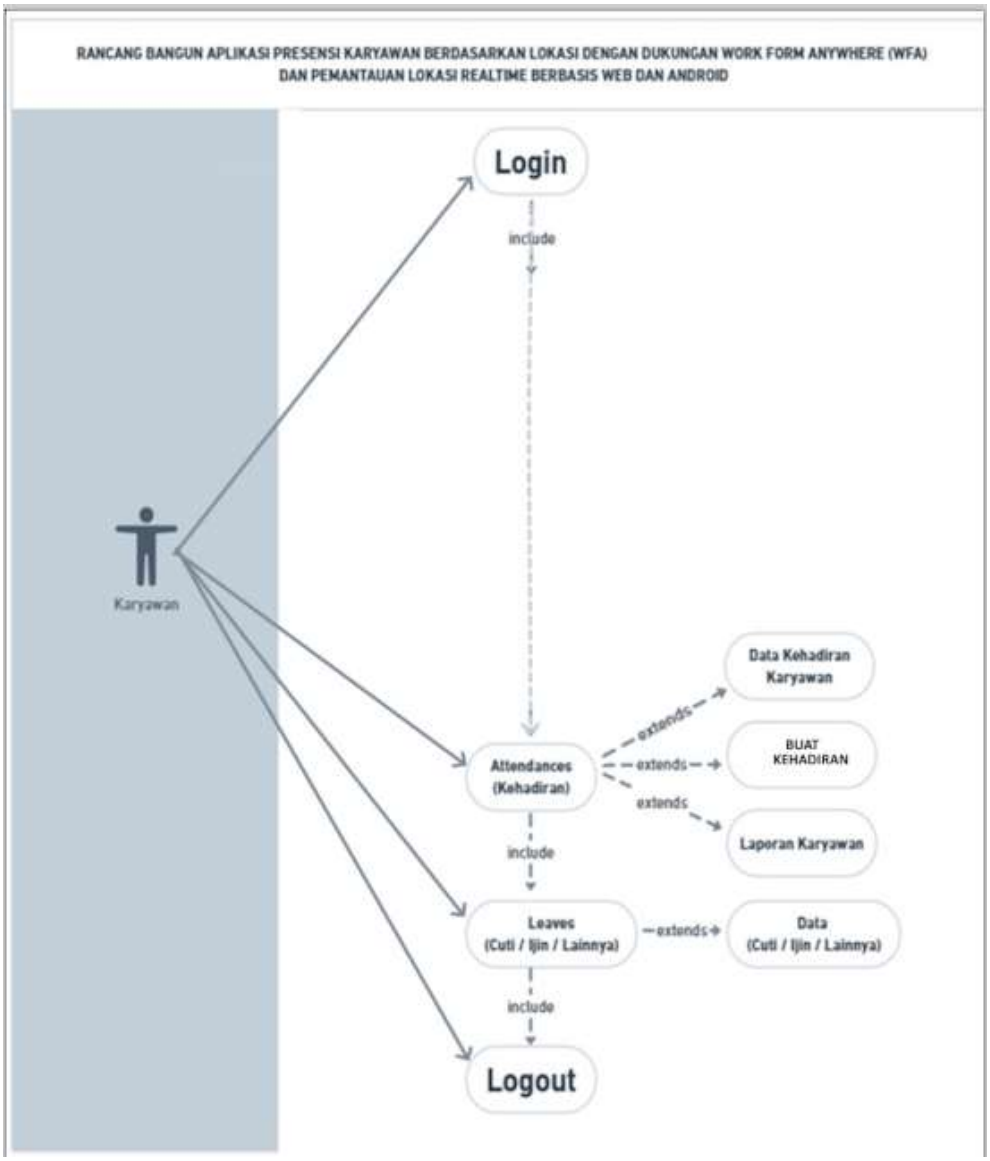

Figure 5. Use Case Diagram for Android Version

3.2. Results

1 Login

The Android mobile login screen is specifically designed for employees who will be taking attendance using the Android-based application. This application does not provide access to users other than employees. When the application is opened, users are directed to a login page that displays the application name and two input fields: email and password. This interface is designed to be simple and responsive for easy access by employees. After correctly entering their credentials, employees are directed to the application's main page to take attendance and view their attendance history. This login system also ensures that only employees with registered accounts can log in and perform attendance activities. This can be seen in Figure 6 below:

Figure 6. Android Application Login Screen

2 Initial Screen

The initial screen on Android mobile is the first page employees see after successfully logging into the application. This can be seen in Figure 7 below:

Figure 7. Android Application Initial Display

3. Attendance Creation Display

The system will match the user's face with facial data stored in the database. Once the face is correctly recognized, the application will automatically record the time and date of attendance. This display also provides brief information such as the employee's name, the day's work shift, and the result of the verification process, whether successful or unsuccessful. If verification fails, the user will be notified to try again. The primary purpose of this page is to ensure attendance is recorded by the correct person and in real time without manipulation. This can be seen in Figures 8 to 15 below:

a. Attendance Creation Display

On the main screen, there is a "Create Attendance" button, which, when clicked, takes the user to the attendance verification process using facial recognition. This page can also display the latest attendance status to confirm whether the employee has previously checked in. This page is designed to be responsive, fast-loading, and easy to understand for all levels of users. This can be seen in Figure 8 below:

Figure 8. Initial Attendance Screen

b. Selfie Screen (Face Verification)

The selfie screen (face verification) is a crucial page in the face recognition-based attendance process on the Android app. This screen automatically activates the device's front camera and displays a real-time preview of the user's face on the screen. The interface is designed to be minimalist, with the main focus on the camera area, accompanied by guides or guide lines to ensure the user's face is positioned correctly. Once the face is clearly detected, the system automatically takes a picture and processes it to verify data match. If the verification process is successful, the user will receive a successful attendance notification. Conversely, if the face is not recognized or the lighting conditions are poor, the system will request a retake. This page ensures that attendance is authenticated by the employee. This can be seen in Figure IV.21 below:

Figure 9. Facial Verification Display

c. Determining Coordinate Location Points

However, for employees who have been assigned work from anywhere (WFA) status by the administrator, the system will still allow attendance to be processed even if they are outside the specified radius. This page is designed interactively, with location validation status indicators and time information, to support the accuracy and security of the attendance process. This can be seen in Figure 10 as follows:

Figure 10. Coordinate Location Point Display

d. After data is successfully saved

This feature ensures that the attendance process is recorded on the server and does not need to be repeated, and provides clarity to the user regarding their absence status. This can be seen in Figure 11 as follows:

Figure 11. Display After Data is Successfully Saved

e. If Photo Capture Fails

In this view, users are given the option to retry taking the photo or cancel the attendance process. The purpose of this feature is to ensure that the entered attendance data is valid and follows procedures, and to provide users with the opportunity to make corrections directly before the data is sent to the server. This can be seen in Figure 12 below:

Figure 12. Failed to Take Photo View

f. Attendance Details View

The attendance details view on the Android mobile application displays complete information regarding the employee's attendance. In this view, users can view data such as the employee's name, the date and time of attendance, and the status (check-in or check-out). This view is designed to be informative and easy to understand, so employees can ensure their attendance data has been recorded correctly and legally. This feature also helps administration or management double-check each employee's attendance history. This can be seen in Figure 13 below:

Figure 13. Attendance Details View

g. Leave

This view also provides a history of previous applications and their status, including whether they are being processed, approved, or rejected. If the leave application is approved by the administrator, the system will automatically deactivate the attendance feature for that employee during the leave period. This feature makes the leave application process faster, more transparent, and easier to manage. This can be seen in Figure 14 below:

Figure 14. Leave View

h. Facial Validation

The system then compares the photo with facial data stored in the database using facial recognition technology. If the face matches, the attendance process can continue, and the attendance data is saved. If it does not match, the user will receive a notification that the facial validation failed and be asked to try again. This feature improves security and accuracy in the attendance process and prevents fraudulent activities such as taking attendance by others. This can be seen in Figure 15 below:

Figure 15. Facial Validation Display

4. Conclusion

Based on the design, implementation, and testing of a location-based employee attendance application with Work From Anywhere (WFA) support and real-time location monitoring, the following conclusions can be drawn Regarding the design and development of a geofencing-based attendance system, the system was successfully developed using geolocation technology that can automatically record employee attendance within a predetermined work location radius. This feature minimizes recording errors because it does not require manual input from the user and has been tested effectively on Android devices. To support the Work From Anywhere (WFA) concept, this application provides employees with the flexibility to record attendance from dynamically predetermined work locations, without having to be physically present at the head office. By utilizing admin-controlled location settings and a GPS-based geofencing system, the system maintains attendance accuracy without sacrificing work flexibility. The system is capable of monitoring employee locations in real time through periodic location tracking during work hours. This allows for monitoring employees working in the field or moving locations. Although real-time monitoring is active, the system maintains device battery efficiency by adjusting tracking intervals according to operational needs. In terms of accessibility and platform integration, the application has been built on both web and Android platforms to reach various devices used by both admins and employees. Testing has shown that the system runs well on both platforms, recording attendance, displaying attendance history, and managing data efficiently. This helps reduce the potential for manual recording errors and improves overall attendance management efficiency.

References

Abetnego, betnego, D. (2024). Aplikasi presensi kerja berbasis Android dengan monitoring lokasi karyawan secara real-time menggunakan maps. *Jurnal Teknologi Informasi*, *13*(2), 111–132.

Adit Hernowo, & Tri Ginanjar Laksana. (2024). Pengenalan pola citra wajah untuk presensi karyawan menggunakan algoritma Eigenface berbasis Android (Studi analisis: Presensi DPP Partai Demokrat). *Jurnal Ilmiah Multidisiplin*, *1*(2), 199–211. https://doi.org/10.62282/juilmu.v1i2.199-211

Alfina, O., & Harahap, F. (2019). Pemodelan UML sistem pendukung keputusan dalam penentuan kelas siswa tunagrahita. *METHOMIKA: Jurnal Manajemen Informatika & Komputerisasi Akuntansi*, *3*(2), 143–150. https://doi.org/10.46880/jmika.Vol3No2.pp143-150

Apriliyani, N., Setiawan, E., & Muchayan, A. (2022). Implementasi metode Agile dalam pengembangan aplikasi pengenalan budaya berbasis web. *Jurnal Ilmu Komputer dan Bisnis*, *13*(1), 8–21. https://doi.org/10.47927/jikb.v13i1.261

Bayu, Y., Siregar, A., Prasetyo, T., Agung, T. C., & Yusman, Y. (2024). Berbasis GPS dan face camera dengan framework Laravel (Studi kasus: PT Kodinglab Integrasi Indonesia). *JITET (Jurnal Informatika dan Teknik Elektro Terapan)*, *12*(3).

Bhalqis, Y. Y. (2020). Sistem pendukung keputusan pemilihan smartphone terbaik menggunakan metode TOPSIS. *Journal of Information System and Technology*, *7*(7), 68–79. https://journal.uib.ac.id/index.php/joint/article/view/1372

Budiyanti, E. (2022). Implementasi metode Haversine formula pada sistem informasi geografis rumah kost daerah Tangerang Selatan. *Jurnal Sistem Informasi Geografis*, *1*(1), 1–7.

Choirinisa, A. A. (2022). Pengaruh penggunaan aplikasi digital terhadap efektivitas kerja pegawai. *Transekonomika: Akuntansi, Bisnis dan Keuangan*, *2*(5), 483–492. https://doi.org/10.55047/transekonomika.v2i5.239

Fadjeri, A., & Hidayat, T. (2024). Implementasi sistem informasi absensi dan nilai berbasis web di SMA Islam Al-Kahfi Somalangu Kebumen dengan metode Waterfall. *Jurnal Sistem Informasi*, *6*(2), 595–611.

Fahlevi, M. R., Syahrido, M., & Ali, I. (2024). Sistem presensi berdasarkan GPS berbasis Android. *Jurnal Teknologi Informasi*, *14*(2), 173–181.

Fatimah, N. S., & Chotijah, U. (2024). Perancangan sistem absensi pegawai berbasis web menggunakan

mapping koordinat: Studi kasus: BAWASLU Kota Surabaya. *Uranus: Jurnal Ilmiah Teknik Elektro, Sains dan Informatika*, *2*(3), 246–257.

Ghani, A. I. Al, & Andrian, R. (2023). Pengembangan Presensee: Aplikasi presensi mahasiswa mobile menggunakan framework Flutter (Studi kasus: Studi Independen Alterra Academy). *Jurnal Media Infotama*, *19*(2), 447–453. https://doi.org/10.37676/jmi.v19i2.4351

Hafiz, A. (2021). Perancangan aplikasi game edukasi pengenalan hewan dan tanaman langka berbasis Android. *Jurnal Teknologi dan Informatika (JEDA)*, *2*(1), 1–12. https://doi.org/10.57084/jeda.v2i1.982

Haura, A., Sari, D. S., Meilliza, V., Rahmawati, N., Azzhara, S. S., Insanil, S., Nabsam, K., Kembara, T. R. T., Timur, L., & Aceh, B. (2022). Implementation of Work From Anywhere (WFA) as a model of the future work system of Indonesian civil servants. *Proceeding Seminar Nasional BSKJI 2022*, 57–66.

Hendriyani, Y., & Suryani, K. (2019). *Pemrograman Android: Teori dan aplikasi*. CV Penerbit Qiara Media.

Iin, S., Ryan, K., Nasaruddin, & Salman, N. (2022). Penerapan metode geofencing untuk aplikasi absensi berbasis Android. *Jurnal Dipanegara Komputer Sistem Informasi*, *16*(1), 97–103.

Khatina Sari, Jasmir, & Arvita, Y. (2022). Perancangan sistem absensi facial recognition menggunakan CNN dan liveness detector pada BPR Central Dana Mandiri. *Jurnal Informatika dan Rekayasa Komputer (JAKAKOM)*, *2*(1), 70–80. https://doi.org/10.33998/jakakom.2022.2.1.63

Kristanto, H. T., Mustakim, A. S., Huda, M. Y. K., & Helilintar, R. (2023). Perancangan aplikasi Android untuk pemilihan tempat wisata di Kota Kediri. *Prosiding Seminar Nasional Teknologi dan Sains 2023*, *2*, 27–34.

Ma'shum, A. A., Remawati, D., & Yudhanto, B. W. (2022). Implementasi metode location-based services pada sistem presensi pegawai. *Jurnal Teknologi Informasi dan Komunikasi (TIKomSiN)*, *10*(2), 47. https://doi.org/10.30646/tikomsin.v10i2.651

Mahatmi, M. F., Hasanuddin, T., & Umar, F. (2022). Implementasi metode Haversine formula untuk menentukan jarak terdekat pada pengantaran air galon Depot Anantama berbasis Android. *Buletin Sistem Informasi dan Teknologi Islam*, *3*(1), 69–78. https://doi.org/10.33096/busiti.v3i1.1098

Maria Claudia Floranca Ijo, Putu Wida Gunawan, Prastyadi Wibawa Rahayu, & Gerson Feoh. (2024). Rancang bangun sistem presensi pegawai menggunakan QR Code (Studi kasus: Komisi Pemilihan Umum Kabupaten Ngada). *Jurnal Ilmu Komputer dan Bisnis (JIKB)*, *15*(2a), 34–44. https://doi.org/10.47927/jikb.v15i2a.836

Mulyana, D. I., & Aribatullah. (2025). Klasifikasi absensi face geo-location menggunakan metode CNN pada PT Indomarco Prismatama. *Jurnal Indonesia: Manajemen Informatika dan Komunikasi (JIMIK)*, *6*(1).

Mulyana, D. I., Yanti, Y., Saputry, A., Ramadan, A., & Saragih, S. (2022). Penerapan face recognition dengan algoritma Haar Cascade untuk sistem absensi pada Yayasan Pusat. *Jurnal Cahaya Mandalika (JCM)*, 215–226.

Pribadi, J. A., & Setiyawati, N. (2021). AbsenLoc: Aplikasi absensi mobile berbasis lokasi. *Jurnal Sistem dan Teknologi Informasi (Justin)*, *9*(1), 33. https://doi.org/10.26418/justin.v9i1.41103

Pulakiang, A., Colling, F. C., & Sitanayah, L. (2024). Rancang bangun aplikasi presensi karyawan berbasis web menggunakan barcode scanner. *Jurnal RESTIKOM: Riset Teknik Informatika dan Komputer*, *6*(1), 214–222. https://doi.org/10.52005/restikom.v6i1.302

Ramadhan, F. I. H., Pandiya, R., & Setyadi, R. (2024). Rancang bangun sistem informasi keuangan tingkat RT menggunakan metode Agile. *JATI (Jurnal Mahasiswa Teknik Informatika)*, *8*(1), 48–56. https://ejournal.itn.ac.id/index.php/jati/article/view/8558

Saputra, T., Utari, A., Teisnajaya, U., & Agustine, G. T. (2023). Peningkatan disiplin kerja karyawan dengan menggunakan sistem absensi self portrait dan geolocation pada PT Sucofindo Palembang. *Klik - Jurnal Ilmu Komputer*, *4*(2), 68–77. https://doi.org/10.56869/klik.v4i2.553

Sinlae, F., Irwanda, E., Maulana, Z., & Syahputra, V. E. (2024). Penggunaan framework Laravel dalam

membangun aplikasi website berbasis PHP. *Jurnal Siber Multi Disiplin (JSMD)*, *2*(2), 119–132. https://doi.org/10.38035/jsmd.v2i2.186

Sukmandhani, A. A., Hambali, F., & Mahadhika, G. (2023). Pengembangan aplikasi pemantauan berbasis lokasi menggunakan metode geofencing pada platform Android. *Jurnal Komunikasi, Sains dan Teknologi*, *2*(1), 118–126. https://doi.org/10.61098/jkst.v2i1.19

Sulyono, S., Antoni, D., & Heri, J. (2021). Sistem presensi karyawan menggunakan metode geofencing dan face capture push notification. *Journal of Information Technology Ampera*, *2*(1), 32–39. https://doi.org/10.51519/journalita.volume2.isssue1.year2021.page32-39.

Susanti, S., Wahyu, D., Laksmana, R., & Achyani, Y. E. (2022). Rancangan sistem informasi layanan administrasi desa berbasis web. *JURIKOM (Jurnal Riset Komputer)*, *9*(5), 1375. https://doi.org/10.30865/jurikom.v9i5.4909.

T, A. Y. M., & Samsudin, E. (2020). Aplikasi presensi pegawai dengan metode Principal Component Analysis (PCA) (Studi kasus: Badan Pusat Statistik Kabupaten Bandung). *Jurnal Teknologi Informasi*, 16–25.

Yulia, F., Anggareni, A., Hutabarat, R. A., Saputro, W. T., Putra, A. T., & Kahfi, M. A. (2022). Work From Anywhere (WFA) ASN: Dampak dan tantangan SPBE. *Prosiding Seminar Nasional BSKJI "Post Pandemic Economy Recovery"*, *2*(2), 10–1