# DEVELOPMENT OF EMPLOYEE ONLINE ATTENDANCE SYSTEM USING WEBCAMS AND WEB-BASED LOCATION (CASE STUDY OF CV. OTW COMPUTER GUSAHA)

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ABSTRACT

*Attendance is an activity of data collection to determine the number of people present at an activity in an institution or company. In the previous era, attendance at CV. OTW Computer Gusaha was still done manually through paper, which was very ineffective and inefficient, resulting in attendance data not being well stored. To solve this problem, a reliable and efficient online attendance application is needed for users. The purpose of this application is to improve the efficiency of the attendance process, facilitate monitoring and evaluation, and minimize the risk of fraud in the attendance process. The method used is the geolocation method. The results of this research show that an online attendance system using a webcam and a web-based location can improve the efficiency of CV. OTW Computer Gusaha and increase the discipline and responsibility of employees.*

**Keywords**: *Attendance System, Employee, Information System, Web-based Location, Webcam*

## 1. INTRODUCTION

Managing employee attendance is a crucial aspect of any organization or company [1]. It allows the company to track employee attendance and monitor their performance [2]. However, in recent years, managing employee attendance has become increasingly difficult using manual methods that require a lot of time and effort. Therefore, many companies have switched to online attendance systems to improve the efficiency and accuracy of employee attendance management [3]. One company that has adopted an online attendance system is CV. OTW Computer Gusaha. The company previously used a manual method to record employee attendance, which made attendance management less effective and efficient. To improve the efficiency and accuracy of employee attendance management, the company decided to develop an online attendance system using webcams and web-based location [4].

The purpose of this research is to evaluate the effectiveness of the developed online attendance system in improving attendance management, employee discipline, and minimizing the risk of fraud in employee attendance management in CV. OTW Computer Gusaha. The developed online attendance system uses geolocation as the main method of recording employee attendance. This method allows for accurate tracking of employee location and attendance. In addition, the use of webcams in the system also provides an additional layer of security to prevent fraud in attendance management [5].

According to [6], employee attendance management is crucial for businesses to track employee productivity and improve company performance. However, manual methods of attendance management can be time consuming and prone to errors [7]. Therefore, companies are turning to online attendance systems to improve the efficiency and accuracy of attendance management [8]. Furthermore, [9] noted that the use of geolocation technology in attendance management can provide accurate tracking of employee attendance, which can improve the efficiency and effectiveness of attendance management. The results of this research show that an online attendance system using webcam and web-based location can improve the efficiency of CV. OTW Computer Gusaha and increase the discipline and responsibility of employees.

## 2. METHODOLOGY

This research aims to evaluate the effectiveness of the developed online attendance system in improving attendance management, employee discipline, and minimizing the risk of fraud in employee attendance management in CV. OTW Computer Gusaha. The research method used in this study is a case study approach. The case study approach is a suitable research method for this study because it allows for an in-depth analysis of the developed online attendance system and its effectiveness in a real-world setting [10]. The case study approach also allows for the collection of qualitative data from various sources, including interviews and observation, to provide a comprehensive understanding of the system's effectiveness [11].

Data collection for this research was conducted through interviews with employees and management of CV. OTW Computer Gusaha. The interviews were conducted to gather information on the effectiveness of the developed online attendance system in improving attendance management and employee discipline [12]. In addition, observation was conducted to monitor the system's usage and identify any issues or challenges in its implementation [13].

The collected data was then analyzed using a qualitative data analysis approach [14]. The data was coded, categorized, and themes identified to provide a thorough understanding of the effectiveness of the developed online attendance system [15].

The steps taken in this research are as follows:

1. Conduct a literature review to discuss the differences from other studies that have been conducted and emphasize the innovation carried out in this research.
2. Conduct interviews with employees and the management of CV. OTW Computer Gusaha to gather information on the effectiveness of the developed online attendance system
3. Conduct observation to monitor the system's usage and identify any issues or challenges in its implementation.
4. Analyze the collected data using a qualitative data analysis approach.
5. Provide a thorough discussion of the research results in the "Results and Discussion" chapter.

The case study approach used in this research provides useful insights into the effectiveness [16] of the developed online attendance system in improving attendance management, employee discipline, and minimizing the risk of fraud in employee attendance management in CV. OTW Computer Gusaha.

## 3. RESULTS AND DISCUSSION

The result of this research is an online attendance application for employees that is designed and developed using the PHP framework and MySQL database. The application can make it easier for employees to take attendance. In addition, the application development also includes location features used to determine the position of attendance and a selfie photo feature for employees who will perform attendance.

Here is the explanation of the application flow diagram:

- Start: The application flow begins.
- Enter the login menu: Users enter the login menu in the application.
- Input username and password: Users input their username and password.
- Login successful?: The system verifies the entered username and password.
  - If the verification is successful, the system proceeds to the next step.
  - If the verification fails, users are informed that the login was unsuccessful and prompted to enter valid credentials.
- Enter the absent menu: After successful login, users enter the attendance menu.
- Absence check-in or check-out: Users choose the option to either check-in or check-out for attendance.
  - If users select check-in, the system records their check-in time and processes the attendance recording.
  - If users select check-out, the system records their check-out time and processes the attendance recording.
- End: The application flow ends.

### 3.1. Attendance Process Interface

On the dashboard page, employees can click on the attendance icon, and they will be directed to the attendance page, where they can select the "check in" button to register their attendance. Afterwards, a notification will appear indicating that the attendance has been successfully recorded.

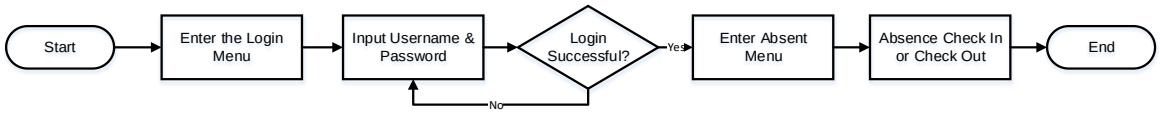


*Figure 1. Application Flow*


*Figure 2. Dashboard page*


*Figure 3. Attendance page*

**Dashboard page**

The dashboard page serves as the main hub or control center for an application or system. Within the Dashboard page, users can view important information and access various features and functions provided. Here is an explanation of the menus found within the Dashboard page:

- Check-In and Check-Out Attendance Menu: This menu is used to perform daily attendance processes, where users can record their arrival time (check-in) and departure time (check-out). This feature helps users monitor and track their attendance accurately.
- Leave Request Menu: This menu allows users to submit leave requests, such as sick leave, personal leave, or other types of leave. Users can fill out a leave request form with the required information and submit it for processing by the relevant authorities.
- Vacation Request Menu: This menu is used to request vacations, including annual leave, maternity leave, or other types of leave. Users can fill out a vacation request form with details of the vacation dates, reasons, and other relevant information.
- Announcement Information Menu: This menu contains the latest information, announcements, or important news that needs to be conveyed to all users. Users can view the latest announcements to stay updated on the most current information from the organization or company.
- Profile Menu: This menu contains users' personal information, such as name, photo, contact details, and other profile details. Users can access and modify their profile information, such as their address, phone number, or profile photo.

Through the Dashboard page, users can manage their daily attendance, submit leave or vacation requests, receive the latest information, and access and manage their personal profiles. This provides users with easy and centralized access to various important features within the system, enhancing efficiency and organization in administrative and management processes.

**Attendance page**

The Attendance page is a dedicated section within an application or system that focuses on managing and tracking attendance-related activities. This page provides users with functionalities and information related to attendance management. Here is an explanation of the attendance page:

- Attendance Summary: This section displays an overview of attendance records, showing details such as total working days, days present, days absent, and any other relevant information that provides a snapshot of the user's attendance history.
- Daily Attendance Log: This section presents a log or list of daily attendance records. Users can view their attendance entries for each day, including check-in and check-out times, attendance status (present, absent, or late), and any additional remarks or notes related to their attendance.

- Monthly Attendance Calendar: This component provides a visual representation of the monthly attendance records. Users can view their attendance status for each day of the month, easily identifying days of attendance and any days marked as leave or other types of absences.
- Attendance Reports: This feature allows users to generate detailed reports on attendance data. Users can specify the date range or other criteria to generate reports such as monthly attendance summaries, individual attendance records, or attendance trends over a specific period.
- Attendance Settings: This section enables users to configure attendance-related settings and preferences. Users can customize parameters such as working hours, break times, attendance rules, and any other relevant settings specific to their organization's attendance policies.

The Attendance page serves as a central hub for users to manage and monitor their attendance. It provides a comprehensive view of attendance records, facilitates tracking of daily attendance entries, offers insights through visual representations, and allows users to generate detailed reports. This helps organizations streamline attendance management processes, improve accuracy, and ensure compliance with attendance policies and regulations.

The Location Detection menu is a feature commonly found in applications or systems that involve location tracking. This feature utilizes GPS (Global Positioning System) technology or other technologies to detect the user's location. Explanation of the features and components within the Location Detection menu:

- User Location: This feature displays the user's current location based on information obtained from GPS or other technologies. It provides real-time mapping of the user's position, which can be used for various purposes such as employee tracking, route determination, or providing recommendations for nearby locations.
- Location History: This section records the user's previously detected locations. Users can view a list of places they have visited, arrival times, and other related information. This history can be useful for tracking travel patterns or reviewing past visits.
- Geo-fencing: This feature allows users to set specific areas or regions as "geofences" or geographic boundaries. When users enter or leave a geofence, the system can provide notifications or trigger predefined actions. For example, users can receive alerts when entering a work area or when children leave a school zone.
- Map Integration: This component provides an interactive map that visualizes the user's location and other related features. Users can view their location directly on the map, zoom in or out, and explore the area easily.
- Privacy Settings: This section allows users to manage privacy settings related to location tracking. Users can set location access permissions, control the transmission of location data, or adjust other preferences based on their needs and preferences.

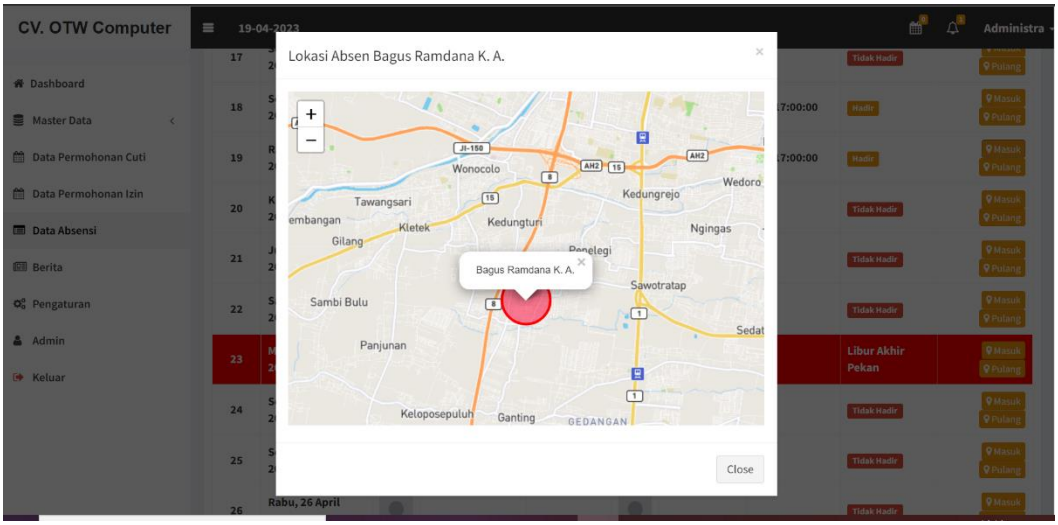


*Figure 4. Location Detection*

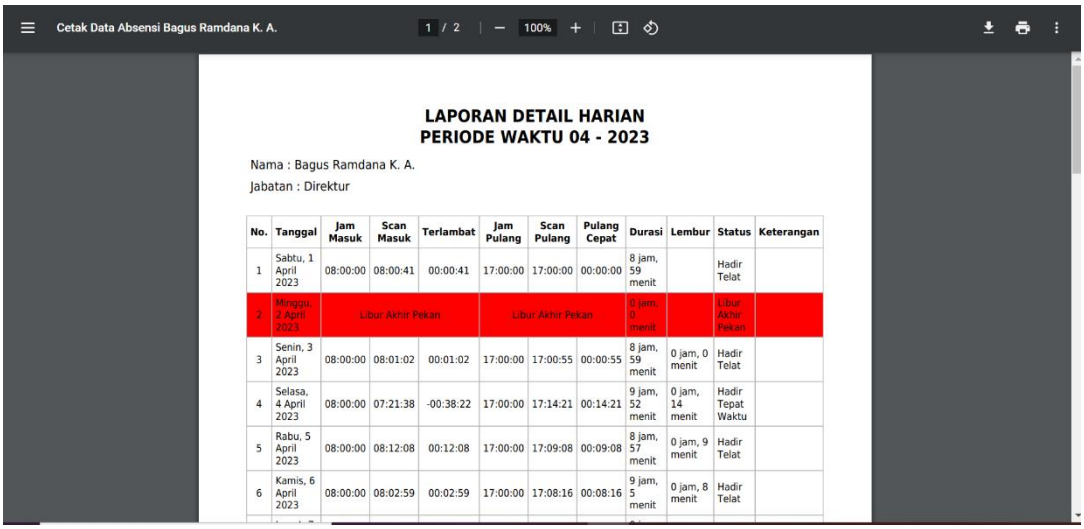


*Figure 5. Attendance Report*

The Location Detection menu gives users access to and control over their location information. This feature is useful in various contexts, such as navigation, travel mapping, distance tracking, or security. It helps users track their location, set notifications based on geofences, and optimize location-based user experiences within an application or system.

### 3.2. Attendance Report

The administrator can view and print employee attendance data on the administrator menu. The detailed employee attendance report provides comprehensive information about the attendance of employees on each specific day. It includes the following details:

- Date: displays the date of the attendance report.
- Check-In Time: Shows the time when employees clocked in or arrived at the workplace for the day.
- Check-Out Time: This indicates the time when employees clocked out or left the workplace for the day.
- Attendance Lateness: This information indicates whether employees arrived late or not. If there is lateness, it will display the duration of the lateness.
- Work Duration: displays the total duration of work for the day. It calculates the difference between the check-in time and the check-out time.
- Overtime Hours: If employees worked overtime on that day, this information shows the duration of overtime worked.
- Lateness Status: Indicates the lateness status of employees for the day, such as late, on time, or no record.
- Attendance Notes: This section can be used to record additional information related to employee attendance, such as reasons for lateness or any other relevant remarks.

*Table 1. Testing Application*

| Test Cases | Test Data | Test Type | output | Results |
|---|---|---|---|---|
| Login | Username and Password are correct | Valid | Pop up successful and headed to dashboard page | Succeed |
| | Incorrect Username and Password | Invalid | Usernames not registered and wrong password | Succeed |
| | Blank Username and Password | Invalid | Username and Password are not can blank | Succeed |
| Roll call | Location no enabled / not allowed | Invalid | No Can absent, appear “Oops! you have decided For No share your position, however nothing. We don't will request again .” | Succeed |
| | Location Enabled | Valid | Roll call successful, the time and date appear roll call | Succeed |

### 3.3. Testing

The detailed employee attendance report provides a comprehensive overview of employee attendance and work hours on a daily basis. It assists the human resources team and management in monitoring and analyzing attendance patterns, identifying lateness issues, managing overtime, and making informed decisions based on accurate information. Enter the system integration and testing process. At this stage, the modules that have been made before will be put together. After the integration process has been completed, the next step is to get into the testing module.

The objective from the testing module is to know if the design and function application from the device soft has fit and is running with ok. So, with stage testing, we can know as well as prevent errors, bugs, or errors in the previous program from entering stage production.

## 4. CONCLUSION

Based on the research conducted, it can be concluded that the development of an online attendance system using a webcam and a web-based location can improve the effectiveness and efficiency of employee attendance at CV. OTW Computer Gusaha. With the online attendance system, employees can easily and quickly perform attendance, and administrators can access employee attendance data more efficiently. The contribution of this research is to provide practical solutions for more effective and efficient employee attendance problems. In addition, the development of this online attendance system can be adopted by other companies and increase overall company productivity.

The weakness of this research is that it is still limited to a case study in one company and has not tested the use of the system on a larger scale. Therefore, future research can look at the development and implementation of the system on a larger scale to ensure its effectiveness and efficiency. The opportunity for future research is the development of an online attendance system with more features, such as the use of artificial intelligence technology and integration with payroll applications. In addition, research can focus on the use of online attendance systems in larger companies with many branches to see the effectiveness of the system on a larger scale.

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