Indonesian Applied Research Computing and Informatics
Vol. 1; No. 1, July 2025, Page 20-29;
https://jurnal.tdinus.com/index.php/iarci

e-ISSN : XXXX-XXXX
p-ISSN : XXXX-XXXX

Development of a Web-Based Rolling and Attendance System for News Coverage Employees at the Communication and Information Office (Kominfo) of Bima City

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Article Info

Received: 07-24-2025
Revised: 07-26-2025
Accepted: 07-30-2025

Keywords:
Attendance System,
Task Rotation,
Web-Based Application,
Digital Transformation,
Waterfall Model

ABSTRACT

The management of attendance and assignment of news coverage tasks at the Public Relations Division of Kominfo Bima City has traditionally been conducted manually, leading to inefficiencies, data inaccuracies, and lack of coordination. This research aims to develop a web-based information system to digitize employee attendance recording and automate the rotation of news coverage assignments. The system development follows the Waterfall model, consisting of stages including requirement analysis, system design, implementation, and testing. The application is developed using PHP for server-side programming, MySQL for database management, and a responsive interface designed with HTML and CSS to ensure usability across various devices. The implementation results demonstrate that the system is capable of recording real-time attendance, distributing tasks fairly among employees, and facilitating performance monitoring by administrators. In conclusion, this system enhances operational efficiency, promotes transparent task delegation, and supports the digital transformation efforts within government institutions, particularly in managing public relations personnel.

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1. Introduction

The Public Relations Division of the Communication and Information Office (Kominfo) of Bima City holds a vital responsibility in disseminating information to the public through government news coverage activities. However, the attendance and task assignment processes are still handled manually, which has led to various problems such as inconsistent schedules, inaccurate attendance records, and unequal task distribution [1], [2].

These issues directly affect the performance effectiveness of the coverage team and the quality of government documentation. Therefore, a technology-based solution is needed to manage attendance and task distribution more efficiently, accurately, and fairly[3] . This research aims to develop a web-based system that automates employee attendance and task rolling at the Public Relations Division of Kominfo Bima City. By utilizing PHP and MySQL technologies and applying the Waterfall method in system development, the proposed application is expected to support digital transformation in government institutions and improve the quality of internal public service deliver [4],[5].

Recent research has focused on developing web-based attendance systems for government agencies to address limitations of manual systems. These studies have implemented various technologies, including PHP and MySQL [5], [6], Laravel Framework and PostgreSQL, and Android-based applications. The systems aim to improve efficiency, accuracy, and data management in employee attendance tracking. Common features include online check-in/check-out, real-time monitoring, and automated report generation . Development methodologies such as Waterfall and Prototype have been employed. Evaluation methods like black box testing and usability scales have demonstrated the effectiveness of these systems in enhancing administrative processes and operational efficiency [7]. The paper discusses the development of a new web-based employee attendance application using Laravel, PostgreSQL, and Rest API to optimize attendance data processing at Diskominfo, West Java Province, addressing the inefficiencies and lack of organization in the current system [8], [9].

2. Methodology

The system development process follows the Waterfall model, consisting of sequential stages: requirement analysis, system design, implementation, testing, and documentation. This method was chosen because the system requirements were clearly defined at the beginning of the project and the development scope was wellstructured [6], [10].

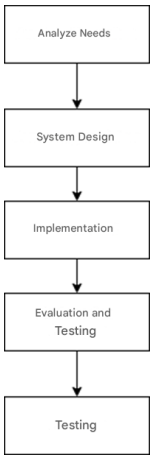

Figure 1. Research Steps

2.1 Requirement Analysis

The requirement analysis was conducted through direct observation and interviews with staff in the Public Relations Division of the Communication and Information Office (Kominfo) of Bima City. The primary goal of this activity was to identify user needs related to the attendance recording process and news coverage task assignments, which had previously been managed manually.

Table 1. System Requirements Identified

No	Requirement Type	Description
1	Digital Attendance	Employees must be able to check in and check out digitally.
2	Location & Time Validation	Attendance must be validated based on location and real-time timestamp.
3	Rolling Task Scheduling	The system should automatically assign and rotate news coverage tasks.
4	Employee Data Management	Stores employee profiles, positions, task history, and attendance logs.
5	Multi-Level Access	Supports different access roles for admins, employees, and supervisors.
6	Automated Reporting	Generates attendance and task assignment reports in downloadable formats (PDF/Excel).
7	Task Notification	Sends automatic notifications for upcoming assignments.

2.2 System Design

The system was designed using Unified Modeling Language (UML) to model user interactions and key processes in the system. In addition, a database structure was designed using an Entity Relationship Diagram (ERD) to ensure efficient data management [11], [12].

Table 2. Diagrams Used in the System Design

No	Diagram Type	Function
1	Use Case Diagram	Describes the functional features of the system and interactions with actors.
2	Activity Diagram	Illustrates the workflows of core processes, such as attendance and scheduling.
3	Entity Relationship Diagram (ERD)	Defines the database structure and the relationships among key data entities such as employees, attendance, and tasks.

2.3 Implementation

The system was implemented as a web-based application to ensure ease of access through various platforms, including desktops, laptops, and smartphones. The development adopted a modular approach that facilitates future scalability, integration, and maintenance. The server-side logic was developed using the PHP programming language due to its flexibility, open-source nature, and wide community support[8], [12]. For database management, MySQL was selected as the Relational Database Management System (RDBMS) to support efficient data storage and complex entity relationships. The frontend interface was built using a combination of HTML5, CSS3, and JavaScript, emphasizing responsive and user-friendly design to enhance the user experience across multiple screen resolutions [6].

Tabel 3. Technology Stack Used in System Implementation

No	Component	Technology Used	Description
1	Frontend	HTML5, CSS3, JavaScript	For building responsive and interactive user interfaces.
2	Backend	PHP	Server-side scripting and business logic processing.
3	Database	MySQL	Relational data storage and management.
4	Server Environment	Apache / XAMPP	Local development and testing environment.
5	Authentication	PHP Session, Role-Based Access	User login, session management, and multi-role access control.
6	Report Export	PHP Spreadsheet / TCPDF	Generation of downloadable PDF and Excel reports.
7	Notification (Optional)	Email / Local Alerts	Task reminders and assignment notifications (planned feature).

2.4 System Evaluation

To ensure that the developed system met the defined functional and non-functional requirements, a series of evaluation and testing processes were conducted. The primary testing approach utilized was black-box testing, which focused on verifying the functionality of each system module based on user interactions and expected outputs, without examining the internal code structure. Test cases were designed for key features such as login authentication, digital attendance logging, task scheduling, role-based access control, report generation, dashboard display, and employee data management. All test cases returned results as expected and were marked as passed.

4. Result

The attendance and rolling task system was developed using the Waterfall model, which is a sequential software development approach. Each phase must be completed before moving to the next. This model was selected due to the clearly defined system requirements and the structured nature of the development process. The developed system successfully addresses the main issues encountered by the Public Relations Division of Kominfo Bima City, particularly manual attendance recording and task distribution. The implementation results showed that the system is capable of recording attendance data in real-time and distributing tasks automatically and fairly [1], [13].

4.1. Needs Analysis

Needs analysis was conducted to identify problems in the absence process and division of coverage tasks in the Public Relations of the Ministry of Communication and Information of Bima City. Several main system needs were obtained, namely: (1) digital attendance recording and stored in a database; (2) automatic and fair division of coverage tasks; (3) active employee data management; and (4) user authentication system to limit access. The results of this analysis are the basis for designing a system that is in accordance with user needs.

4.2. System Design

System design is carried out based on the results of the needs analysis using the Unified Modeling Language (UML) approach. The design includes the preparation of use case diagrams to describe the interaction between users and the system, as well as database design using Entity Relationship Diagrams (ERD) to ensure structured and efficient data relations. The system structure is built into two main modules, namely the attendance module and the task rotation module. The interface design is designed to be simple and responsive so that it is easy to use by admins without technical training. All of these design elements are used as references in the implementation stage of the web-based system [2], [10]. This section is an explanation of all diagrams (Use Case, Activity, ERD, etc.) as part of the system design.

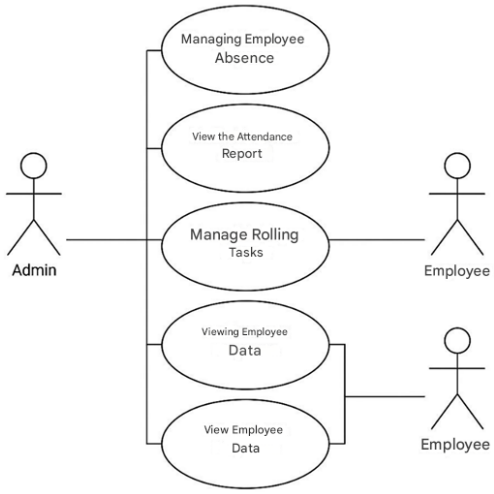

Figure 2. Use Case Diagram

Based on Figure 2, the use case diagram illustrates the interaction between actors (users) and the system being developed, emphasizing role-based access control. There are two primary actors: Admin and Employee, each with distinct access rights and responsibilities. The Admin has full system authorization, which includes managing employee attendance (inputting, editing, and validating data), viewing attendance reports for monitoring purposes, managing and distributing rolling tasks automatically, and accessing all registered employee data. On the other hand, the Employee has limited access, specifically to view rolling task schedules assigned by the admin and to review general employee profile information. This structure ensures that system access is granted according to user roles, supporting data integrity and operational efficiency.

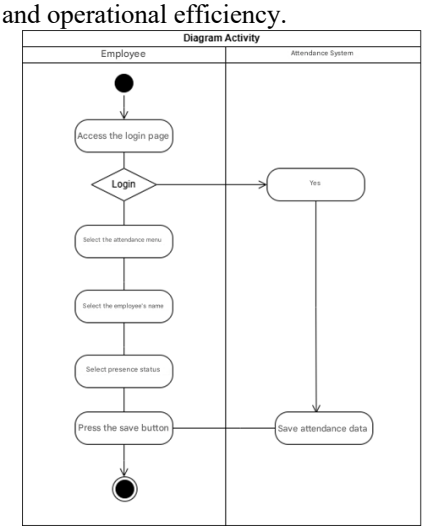

Figure 3. Activity Diagram of the Attendance Process

Based on Figure 3, illustrates the activity flow (activity diagram) of the attendance filling process by employees in the developed system. This diagram is divided into two main swimlanes, namely Employees and Attendance System, which show the responsibilities of each party in the process. The process begins when an employee accesses the system login page. After performing a valid login, the user is directed to the main menu and selects the attendance feature. Next, the employee is asked to select a name (if there is more than one entity that can be accessed) and attendance status such as Present, Permission, or Sick [3], [14], [15].

After all data is selected, the employee presses the Save button, and the system automatically processes and saves the attendance data into the database. This activity diagram show in figure 4, describes a sequence of steps systematically and emphasizes the interaction between users and the system, which is an important part of functional testing of web-based systems.

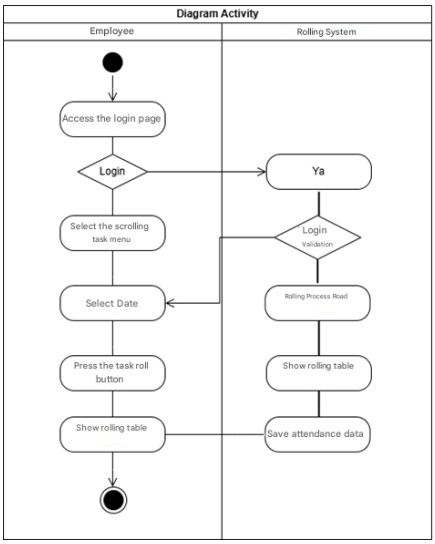

Figure 4. Activity Diagram of the Rolling Process

Based on Figure 4, shows an activity diagram that illustrates the flow of employee task rolling process in the developed system. This diagram is divided into two swimlanes, namely Employees and Rolling System, which show the role of each party in the activity flow. The process begins with employees accessing the login page. After successfully logging in and being validated by the system, users can access the Rolling Task menu. Next, users select the coverage date and press the Roll Task button to trigger the system to run the rolling logic.

The system then automatically processes employee data and displays the resulting task rolling table. In addition to being displayed, the data is also stored in a database for documentation purposes and future assignment references. This diagram confirms that the task rolling process is carried out systematically and automatically, so that it can replace the manual process that was previously prone to errors and imbalances in workload between employees.

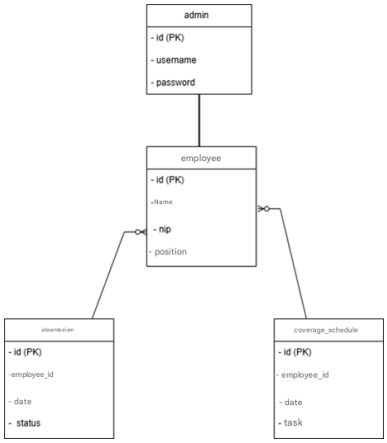

Figure 5. Entity Relationship Diagram (ERD)

Based on Figure 5, shows an Entity Relationship Diagram (ERD) that describes the data structure and relationships between entities in the system. There are four main entities that form the basis of the relational database, namely: admin, employee, attendance, and schedule_coverage. (1) The admin entity stores the system administrator login information, with the attributes: id (PK), username, and password. The admin is responsible

for managing attendance data and coverage schedules. (2) The employee entity represents employees whose attendance will be recorded and assigned coverage tasks. Its attributes consist of id (PK), name, nip, and position. (3) The attendance entity stores employee attendance records based on the attributes id (PK), employee_id (FK), date, and status. The relationship shows that one employee can have many attendance records (one-to-many relationship). (4) he coverage_schedule entity stores information on the distribution of rotating tasks. Its attributes include id (PK), employee_id (FK), date, and task. Just like attendance, one employee can have many coverage schedules [13]. The relationship between entities is shown through connecting lines:

1. admin is connected to employees as data managers,
2. employees become the central entity connected to the attendance table and coverage_schedule as a foreign key (employee_id).

This ERD design supports structured and efficient data integration for digital attendance needs and automatic task distribution in the web-based system being developed.

4.3 .Implementation

The system is implemented using PHP programming language and MySQL database, with HTML and CSS based user interface. The development process is done in a local environment using XAMPP and Visual Studio Code [6]. The implementation includes two main features: a digital attendance module and a reporting task rotation module. The attendance module allows direct attendance recording into the database, while the rotation module automatically divides reporting tasks based on date and active employee list. All system functions have been integrated into a single web-based platform that can be accessed internally by the Public Relations admin of Kominfo.

1. Login Page

   Admin login page on the Employee Rollover and Attendance system for News Coverage at the Public Relations of the Ministry of Communication and Information of Bima City. This page functions as the main entrance to the system and can only be accessed by users who have admin access rights. On this page there are two main inputs, namely:

   • Username: Column to enter the username/admin that has been registered previously.
   • Password: Column to enter the password as security verification.

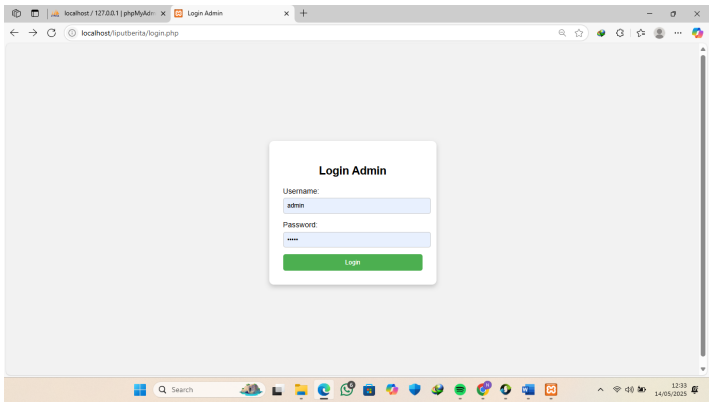

Figure 6. Login Page

2. Home Page

   The Kominfo Kota Bima Public Relations Dashboard is a web-based information system designed to streamline attendance tracking and task scheduling for public relations staff. Through the Attendance feature, staff members can easily record their daily presence, while the Rolling Task feature allows administrators to efficiently manage and organize rotation schedules for coverage duties. This system supports digital work management, enhances accountability, and simplifies the monitoring of daily staff activities. Dashboard Kominfo show in Figure 7.

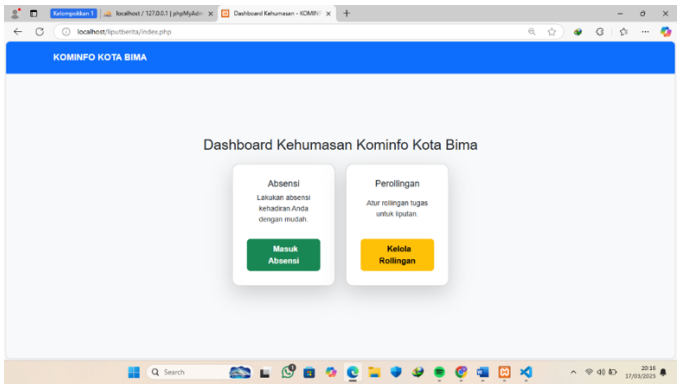

Figure 7. Dashboard page

Figure 7, describe main page of the Kominfo Kota Bima Public Relations Dashboard serves as a simple and user-friendly entry point to two key functionalities: Attendance and Rolling Task Management. Users can choose to either record their daily attendance via the green "*Masuk Absensi"* button, or manage staff rotation for media coverage tasks by clicking the yellow *"Kelola Rollingan"* button. This interface is designed to help streamline public relations operations, making it easier for staff to report their presence and for administrators to assign and monitor task schedules efficiently.

3. Employee Attendance Page

Contains an attendance form that allows employees to select their name and attendance status (Present, Permission, Sick, Alpha). The data entered will be directly saved into the database by automatically recording the date and time.

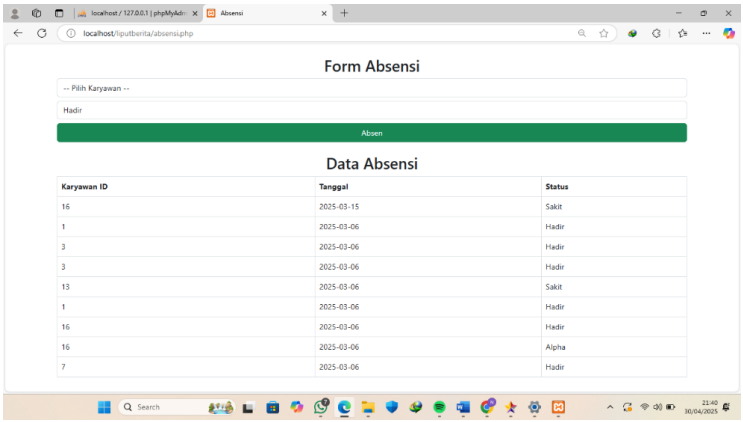

Figure 8. Attendance Page

Based on Figure 8, The Absence Form page of the Kominfo Kota Bima Public Relations Dashboard allows employees to record their daily attendance status by selecting their name from a dropdown menu and choosing the appropriate attendance status such as “Present,” “Sick,” or “Alpha.” Once submitted, the attendance data is displayed in the Absence Data on table below, which lists employee IDs, dates, and their corresponding attendance status. This interface enables real-time tracking and documentation of employee attendance, promoting transparency and ease of monitoring for HR or administrative personnel.

4. Task Rolling Page

Can set up rolling tasks, such as selecting dates and automatically assigning employees to various coverage categories. Displays a list of tasks that have been automatically distributed by the system. Has search and filter features to make it easier for admins to find the data tasks they need.

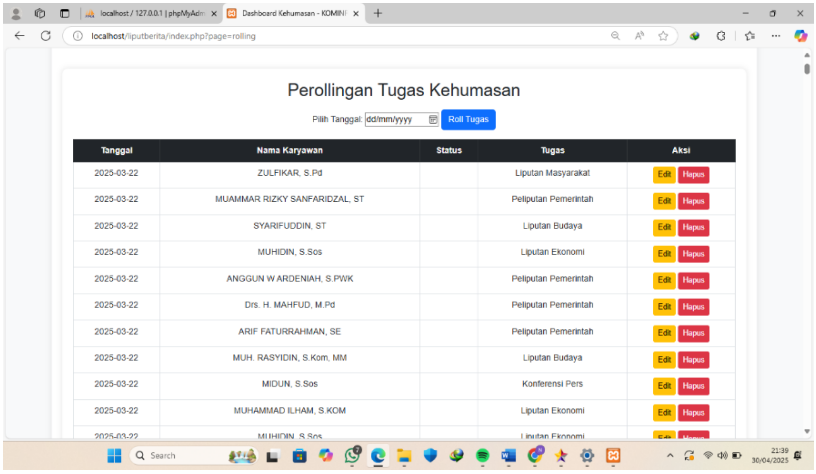

Figure 9. Rolling Page

Based on Figure 9, the rolling Task page in the Kominfo Kota Bima Public Relations Dashboard allows administrators to manage and organize coverage assignments for public relations staff. Users can select a specific date to view or assign tasks, which are then displayed in a structured table format listing the employee name, task date, status, and assigned duty (e.g., community coverage, government reporting, press conferences, etc.). The interface also provides **Edit** and **Delete** (Hapus) buttons in the **Action** column to update or remove assignments as needed. This feature helps ensure a clear and organized rotation of responsibilities among team members for various public communication needs.

4.4. Evaluation and Testing

System testing is done using a black-box testing approach, which focuses on testing functionality based on input and output without considering the internal structure of the program code. This method is used to evaluate whether the system has worked according to the specified specifications from the end user's perspective. Table 1 shows the test results on six scenarios that represent the main modules in the system, namely Login, Attendance, Task Rolling, and Rolling Tasks. Each module is tested based on a scenario that is adjusted to the real conditions of use. Testing on the Login module shows that the system is able to verify user credentials correctly, both when the data is valid and invalid. In the Attendance module, the system is proven to be able to store attendance data into the database, as well as provide validation if the data is incomplete [3], [6]. The Task Rolling module also functions well in automatically dividing tasks based on the selected date, and the results can be displayed again in the Rolling Task module by employees.

All test scenarios provide actual results that are in accordance with expectations, so that all modules are declared to have passed functional testing. This indicates that the system has met the basic functional aspects and is ready to be used by end users in the operational context of the Public Relations of Kominfo of Bima City.

Table 4. Functional Testing

No	Module Name	Test Scenario	Expected Result	Actual Result	Status
1	Login	User enters valid username and password	Successfully logged in to the dashboard	In accordance	Passed
2	Login	Incorrect username/password	Error message displayed	In accordance	Passed
3	Absence	Admin fills in attendance and saves	Data is saved to the database and displayed	In accordance	Passed
4	Absence	Admin does not select attendance status	Validation message displayed	In accordance	Passed
5	Task Rolling	Admin selects the date and clicks “Rolling”	The system automatically divides tasks to employees	In accordance	Passed
6	Rolling Tasks	Employees view task schedules	Tasks appear according to date and name	In accordance	Passed

4.5. Maintenance

The maintenance phase is carried out after the system has been implemented and tested. Maintenance activities are focused on monitoring the system in daily use and fixing minor bugs found during the operational process. In addition, user input is recorded as a consideration for further development, such as adding automatic reporting features, notification systems, and integration with internal personnel systems.[10] This maintenance aims to ensure the system remains stable, relevant, and able to adapt to user needs over time.

5. Conclusion

This research successfully developed and implemented a web-based attendance and task rotation system within the Public Relations division of Kominfo Bima City. The system effectively automated attendance tracking and the assignment of coverage tasks in an efficient, accurate, and equitable manner. Testing confirmed that the system operated reliably and was user-friendly, requiring no additional training. Its implementation not only enhanced operational efficiency but also contributed to the broader digital transformation of internal processes in government institutions. Moving forward, the system has the potential to be expanded with features such as automated notifications, statistical reporting, and integration with other human resource management systems.

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