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IMPLEMENTATION OF INFORMATION SYSTEM FOR SHIFT SCHEDULING AND PAYROLL MANAGEMENT AT MANG JANA RICE STORE.

Arif Bakti Nugraha¹, Imannudin Akbar²
Universitas Informatika dan Bisnis Indonesia^{1,2}
Email: arifbakti@unibi.ac.id¹, imannudin@unibi.ac.id²

Abstract

Shift planning and payroll management in small and medium-sized enterprises (SMEs) often face inefficiencies and inaccuracies due to manual processes. This research focuses on the implementation of an information system to overcome this challenge at Mang Jana Rice Shop, Bandung. The system aims to automate shift planning and payroll calculation, ensuring accuracy and operational efficiency. Using the case study method, this research involves the phases of needs analysis, design, development, testing, and implementation of the system. The resulting system integrates shift planning with payroll management, reducing payroll errors and optimizing employee scheduling. The system has been tested and evaluated, showing significant improvements in efficiency and user satisfaction. This research contributes to the digital transformation of SMEs by providing practical solutions for managing employee tasks. Further developments, such as mobile integration and advanced attendance tracking, are recommended to improve usability and functionality..

Keywords : Implementation, Information System, Scheduling, Shift, Payroll, Rational Unified Process, Unified Modelling Language.

INTRODUCTION

Small and medium-sized enterprises (SMEs) play an important role in the economy and contribute significantly to employment and economic growth. However, many SMEs face operational challenges due to reliance on manual processes, including shift scheduling and payroll management. This manual method often leads to inefficiencies such as errors in employee shift management, inaccuracies in payroll calculations, and increased administrative workload.

Mang Jana Rice Store, a growing business in Bandung, faces similar challenges. The store's operations rely heavily on effective employee scheduling and accurate payroll processing to ensure that daily tasks run smoothly. While important, current manual systems have limitations, including errors in wage calculations and inefficiencies in employee shift assignment. These issues can impact employee satisfaction

and the company's overall operational performance.

To overcome this challenge, the implementation of an information system is proposed. The system can automate and simplify shift planning and payroll processes, ensuring accuracy, reducing administrative burdens, and increasing operational efficiency. This research focuses on the development and implementation of an information system tailored to the needs of the Mang Jana Rice Store, highlighting its potential to transform traditional management practices into a more efficient and reliable system.

This article discusses the design, development, and implementation of the system, with the aim of providing a practical and scalable solution to SMEs facing similar operational challenges. The study also evaluated the effectiveness of the system and identified opportunities for future enhancements, including advanced features and potential integrations..

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METHOD

This research involved the development of an information system for shift planning and payroll management using the Laravel framework, a widely used PHP-based web application development framework. The system is designed to operate as a web-based platform to ensure accessibility, scalability, and ease of integration with other tools or systems.

1. Development Approach

The development of the system follows a structured approach composed of several main phases:

a) Requirements Analysis

- Identify the operational needs of Mang Jana Rice Shop through interviews and observations.
- Define functional requirements, such as shift planning, payroll calculation, and user access management.
- Document non-functional requirements, including performance, security, and usability.

b) System Design

- Designed the system architecture using Laravel's Model-View-Controller (MVC) framework to separate logic, presentation, and data layers.
- Created a database schema for employee data, work hours, and payroll records using MySQL.
- Developed wireframes and prototypes for user interfaces to ensure user-friendly interactions.

c) System Development

- Integrated back-end functionality in Laravel, leveraging its built-in libraries

and tools for authentication, database management, and routing.

- Developed the front-end using Blade templates to ensure a fluid and responsive design for web environments.
- Integrate third-party packages as needed to enhance system functionality such as reporting and data export.

d) Testing

- Performed unit testing for each component of the system to ensure the component works as it should.
- Perform integration testing to verify seamless interaction between planning, payroll, and reporting modules.
- Perform usability testing with end users to gather feedback and identify potential improvements.

e) Implementation and Implementation

- Deploy the system on a web server, ensuring secure access to authorized users only.
- Train store staff on effective use of the system for daily operations.
- Monitor system performance and troubleshoot technical issues after implementation.

2. Tools and Technology

The tools and technologies used in this project include:

- **Framework** : Laravel
- **Programming Languages** : PHP, HTML, CSS, JavaScript
- **Database Management System** : MySQL
- **Development Environment** : Visual Studio Code, Composer

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- **Version Control** : GitHub
- **Web Server** : Apache or Nginx

3. Benefits of Web Templates

Choosing a web-based model for your system offers several advantages:

- **Accessibility** : Users can access the system from any device with an Internet connection.
- **Centralized Data Management** : All data is stored on a single server, reducing redundancy and increasing data consistency.
- **Scalability** : The system can accommodate future growth, including additional features or increased user demand.
- **Ease of maintenance** : Updates and maintenance can be performed on the server without the need for a local installation.

This methodology ensures the development of a robust, efficient and user-friendly system that meets the specific needs of Mang Jana Rice Store while providing scalability and adaptability for future use.

RESULTS AND DISCUSSION

This chapter presents the design and development of an information system for shift planning and payroll management at Mang Jana Rice Store. The system was developed following a structured process, from use case analysis to database design. Each component of the system architecture is detailed to provide a complete understanding of its functionality and implementation.

1. Use Case Diagram

Use case diagrams describe the interactions between users and systems. The main actors identified are **Administrators** and **Employees**. Key use cases include:

- Managing employee data.
- Creating and updating team schedules.
- Calculating and maintaining payroll.
- Viewing reports.

This diagram provides an overview of the system's functionality and highlights the basic processes involved in payroll planning and management.

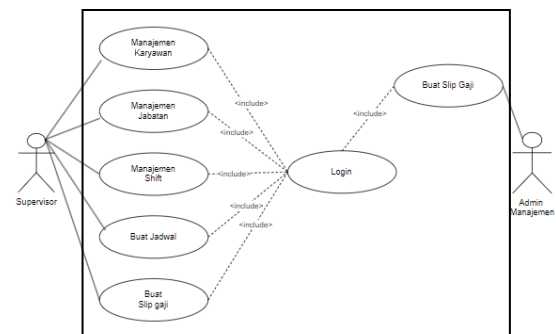


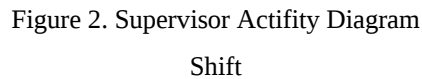
Figure 1. Use Case Diagram

2. Activity Diagram

Activity diagrams map the flow of actions for critical processes, ensuring a logical sequence of operations. The main activity diagram includes:

- Shift Scheduling Process** : Describes the steps from entering employee availability to finalizing the schedule.

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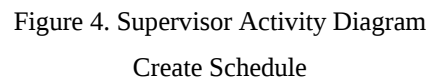
```

graph TD
    subgraph Admin_Manajemen [Admin Manajemen]
        Start(( ))
        PilihMenu[Pilih menu slip gaji]
        PilihTombol[pilih tombol rentang tanggal cetak]
        JalankanFungsiCetak1[jalankan fungsi cetak]
        JalankanFungsiCetak2[jalankan fungsi cetak]
        End(( ))
    end

    subgraph Sistem [Sistem]
        MenampilkanTabel[menampilkan tabel slip gaji karyawan]
        JalankanFungsi1[jalankan fungsi]
        Decision1{ }
        TampilkanDaftar[tampilkan daftar slip gaji berdasarkan rentang tanggal]
        JalankanFungsi2[jalankan fungsi]
        Decision2{ }
    end

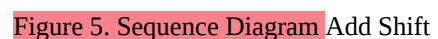
    Start --> PilihMenu
    PilihMenu --> MenampilkanTabel
    MenampilkanTabel --> PilihTombol
    PilihTombol --> JalankanFungsi1
    JalankanFungsi1 --> Decision1
    Decision1 -- "rentang tanggal" --> TampilkanDaftar
    TampilkanDaftar --> JalankanFungsiCetak1
    Decision1 -- "Error" --> JalankanFungsiCetak2
    JalankanFungsiCetak1 --> Decision2
    JalankanFungsiCetak2 --> Decision2
    Decision2 -- "Sukses" --> JalankanFungsiCetak1
    Decision2 -- "Error" --> JalankanFungsi2
    JalankanFungsi2 --> End
  
```

c) **Reporting** : Shows the process of compiling shift and payroll data into actionable reports.



3. Sequence Diagram

a) **Shift Schedule** : Shows how the administrator enters shift data and how the system processes and stores the schedule.



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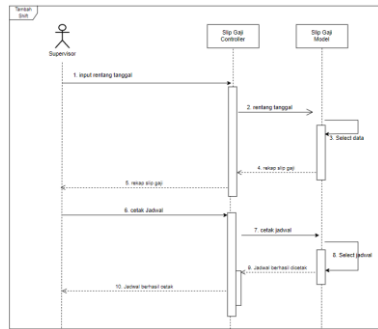


Figure 6. Sequence Diagram Create Shift

- b) **Payroll Processing** : Demonstrates the sequence of actions from retrieving shift data to calculating and saving payroll.

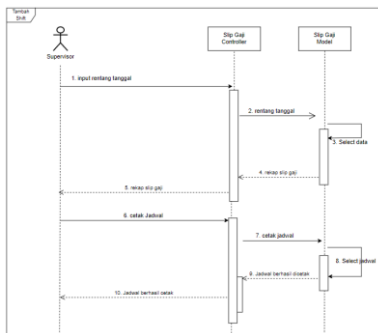


Figure 7. Sequence Diagram Payroll

These diagrams highlight the synchronization and interaction of system modules, ensuring data flow and smooth user interaction.

4. Class Diagram

A class diagram defines the structure of a system by illustrating the relationships between classes. Basic courses include:

- **Employee** : Contains attributes such as `ID`, `Name`, `Position`, and `Salary`.
- **Shift** : Contains attributes such as `Shift\_ID`, `Employee\_ID`, `Date`, and `Time`.
- **Payroll** : Manage attributes such as `Payroll\_ID`, `Employee\_ID`, `Total\_Hours`, `Salary`, and `Deductions`.

- **Reports** : Generate detailed work schedules, summaries, and payroll notes. These diagrams ensure a robust and scalable data structure to support system functionality.

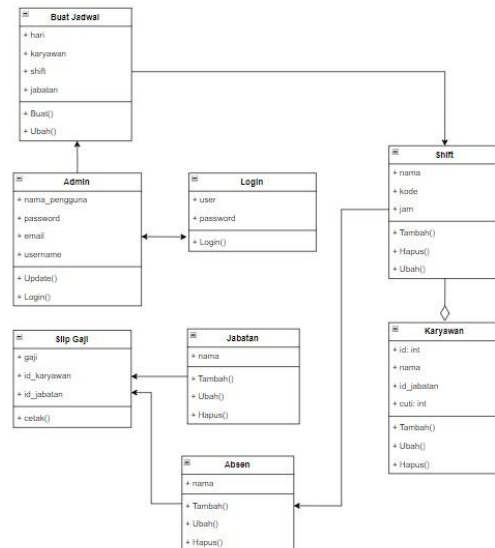


Figure 8. Class Diagram

5. Database Design

Databases are designed to efficiently support system operations. The main tables include:

- Employee Table** : Store employee details such as ID, name, and location.
- Shift Table** : Record shift times including employee assignments and time management.
- Payroll** : Capture payroll data including hours worked, pay items, and deductions.
- Report Table** : Save generated reports for future reference.

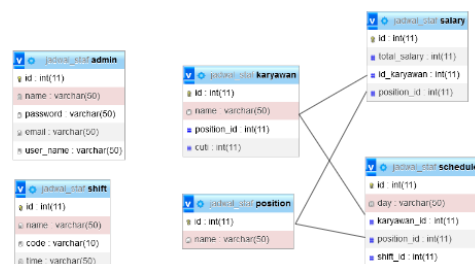


Figure 9. Database

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Normalization techniques are applied to minimize redundancy and ensure data integrity.

6. System Workflow

The integration of all charts into a coherent workflow ensures that all processes from planning to payroll run smoothly. Workflows are aligned with user requirements, allowing administrators to manage operations efficiently and employees to easily access relevant data.

7. Discussion

The system design effectively addresses the challenges faced by Mang Jana Rice Store. The use of Laravel provides a modular and maintainable framework, while the web-based architecture ensures accessibility. The integration of diagrams and database design represents a structured approach that enables efficient planning and accurate payroll calculations. Possible future enhancements include adding mobile accessibility and integrating biometric attendance tracking.

8. User Interface Design

The user interface (UI) design aims to create a simple, intuitive, and easy-to-use experience for administrators and employees. The UI was developed using Laravel's Blade templating engine to ensure responsiveness and accessibility across all devices. An explanation of the main UI components is provided below:

a) Login Page

The login page provides secure access to the system for administrators and employees. This page includes input fields for username and password, as well

as a "Forgot Password" feature for account recovery.

b) Dashboard

The dashboard serves as a central hub for navigating the system. The dashboard displays an overview of key metrics such as total employees, upcoming shifts, and payroll summary. Interactive widgets and charts are used to visualize data and make it easier to interpret.

c) Team Management Page

This page allows administrators to create, edit, and view shift schedules. This page displays:

- Calendar view to view scheduled shifts.
- Form to assign employees to specific shifts, with drop-down menu to select date and time.

d) Payroll Management Page

The payroll page allows administrators to calculate and manage employee salaries. This page includes:

- Input form to adjust salary items such as overtime and deductions.
- Table view showing detailed salary information for each employee.
- Export functionality to create payroll reports in PDF or Excel format.

e) Reports Page

This page provides tools to create and view payroll teams and reports. Users can filter reports by date range, employee, or team type. The generated report is presented in table form with the ability to export.

f) Employee Self-Service Page

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Employees can log in to view assigned shifts, payroll details, and attendance records. The interface is designed to be simple and accessible, ensuring ease of use for non-technical users.

9. User Interface Illustrations



Figure 10. Login Page



Figure 11. Dashboard

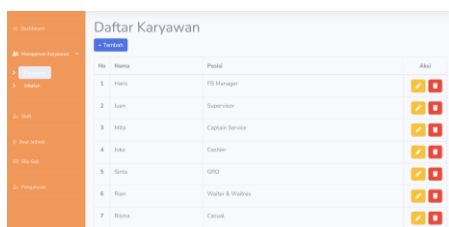


Figure 12. Employee



Figure 13. Shift Management Page



Figure 14. Payroll Management Page

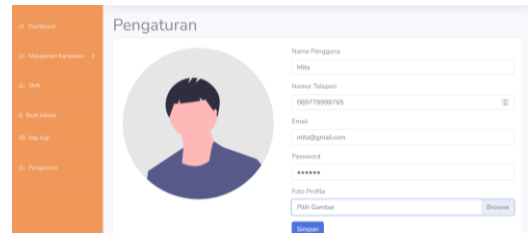


Figure 14. Employee Self-Service Page

This user interface was designed with a focus on simplicity, functionality, and user satisfaction, ensuring that the system meets the operational needs of Mang Jana Rice Store while being accessible to all users.

CONCLUSION

This research successfully developed and implemented a web-based information system for shift scheduling and payroll management at Mang Jana Rice Store using the Laravel framework. This system addresses key challenges faced by stores such as inefficient manual scheduling, inaccuracies in payroll calculations, and increased administrative workload. The following conclusions can be drawn:

1. Efficiency in Crew Planning

The system simplifies the shift scheduling process by providing an intuitive interface and automated functionality, ensuring optimal workforce distribution and minimizing conflicts.

2. Accuracy in Payroll Management

A payroll module integrated with crew data enables accurate payroll calculations including overtime adjustments and deductions, reducing errors and saving time.

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3. User Accessibility and Scalability

The web-based model ensures easy access for administrators and employees, with the possibility of future integration of advanced features such as biometric attendance tracking and mobile compatibility.

4. Better Operational Management

By consolidating data and automating processes, the system improves overall operational efficiency, reduces reliance on manual processes, and improves data consistency.

This research highlights the value of using information systems for SMEs, providing practical and scalable solutions to operational challenges.

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