Project Documentation

Work4Sync : Elevate Your Workforce

Table of Contents

Declaration i

Course & Program Outcome ii

1 Introduction 1
- 1.1 Introduction
  - 1.1.1 Purpose
  - 1.1.2 Intended Audience and Reading Suggestions
- 1.2 Motivation 2
- 1.3 Objectives 2
- 1.4 Gap Analysis 2
- 1.5 Project Outcome 3

2 Proposed Architecture 5
- 2.1 Requirement Analysis & Design Specification 5
  - 2.1.1 System Feature 5
  - 2.1.2 Proposed System Design 8
  - 2.1.3 UI Design 11
- 2.2 Overall Project Plan 15

3 Implementation and Results 17
- 3.1 Implementation 17
- 3.2 Performance Analysis 17
- 3.3 Results and Discussion 18

4 Engineering Standards and Mapping 19
- 4.1 Impact on Society, Environment 19
  - 4.1.1 Impact on Life 19
  - 4.1.2 Impact on Society & Environment 19
  - 4.1.3 Ethical Aspects 20
- 4.2 Complex Engineering Problem 20
  - 4.2.1 Mapping of Program Outcome 20
  - 4.2.2 Complex Problem Solving 20
  - 4.2.3 Engineering Activities 21

5 Conclusion **22**
5.1 Summary 22
5.2 Limitation 22
5.3 Future Work 22

Reference **24**

Chapter 1

Introduction

This chapter presents the Work4Sync HRMS, outlining its purpose, target audience, and main objectives. It also Includes a gap analysis, comparing the system with existing HR solution and identifying areas for enhancement and strategic development

1.1 Introduction

1.1.1 Purpose

The purpose of the Human Resource Management System (HRMS) called Work4Sync is to deliver a web-based solution that automates and simplifies key HR tasks, focusing on leave management and payroll tracking for small to medium-sized enterprises (SMEs). This system centralizes HR processes, enhancing efficiency and accuracy. This Software Requirements Specification (SRS) document outlines the requirements for the initial release of the Human Resource Management System (HRMS), which centralizes and automates key HR tasks such as user management, employee information management, leave management, payroll tracking and more. Future enhancements will be addressed in later iterations.

1.1.2 Intended Audience and Reading Suggestions

Following are the Intended Audience of this document,

- **Developers :** Implementation Plan, Design & Prototype, Scope & Features
- **Project Managers :** Project Overview, Implementation Plan
- **Marketing Staff :** Project Overview, Target Audience, Scope & Features
- **Users :** Target Audience, Design & Prototype, Future Enhancements
- **Testers :** Testing and Validation, Implementation Plan
- **Documentation Writers :** Project Overview, Design & Prototype

1.2 Motivation

The motivation for developing the Work4Sync HRMS is to simplify and automate key HR tasks, particularly in small to medium sized enterprises (SMEs), where resources and time are often limited. Traditional manual HR processes are often error-prone and time consuming, leading to inefficiencies and increased operational costs. Work4Sync aims to address these challenges by automating HR functions like leave management and payroll tracking, ensuring greater accuracy, transparency, and ease of use.

This will not only improve the overall HR and employee experience but also support business growth by providing a scalable solution that meets the evolving need for SMEs. Solving these problems will benefit organizations by reducing administrative workload, improving decision-making, and enhancing compliance with HR policies.

1.3 Objectives

The main objective of the HRMS, Work4Sync, is to automate and streamline HR tasks like leave management and payroll tracking for SMEs, enhancing efficiency, accuracy, and user experience while supporting scalability and compliance.

- **Boost Efficiency:** Automate leave and payroll processes to reduce manual work and errors.
- **Enhance Transparency:** Provide clear, accessible information for both HR personnel and employees.
- **Simplify Use:** Design an intuitive interface for easy navigation and management.
- **Support Growth:** Ensure scalability to accommodate future increases in users and data.
- **Ensure Accuracy:** Maintain precise records and support compliance with policies.

1.4 Gap Analysis

Feature	BambooHR	Zenefits	Our HRMS
User Interface	Complex	Simple	Simple easy to use
Third-Party Tools	Moderate	Limited	None
Mobile Functionality	High	Basic	Basic
Attendance Feature	None	Good	Moderate
Analytics Dashboard	Moderate Insightful	Low Insightful	Highly Insightful

Leave Management	Moderate	Good	Advanced
Payroll Management	Moderate	Moderate	Simple

Table 1.1 : Comparison table for Gap Analysis

The gap analysis between our proposed web application, Work4Sync, and competitors like BambooHR and Zenefits highlights several key areas for improvement. Firstly, BambooHR's complex user interface presents a steep learning curve, while Work4Sync aims to offer a simple and intuitive design for easier navigation. Additionally, both competitors provide dedicated mobile applications, a feature currently lacking in our system, which we plan to address in future updates. In terms of data security, BambooHR and Zenefits implement robust measures, whereas Work4Sync will enhance security through advanced encryption technologies in upcoming versions. Furthermore, while both competitors offer HR analytics dashboards, they often lack comprehensive KPIs and effective visualization; Work4Sync will focus on these features to provide deeper insights. Lastly, we recognize the need to simplify leave management processes, an area where existing solutions are already strong. By strategically addressing these gaps, Work4Sync aims to position itself as a competitive player in the HR technology market.

1.5 Project Outcome

The Human Resource Management System (HRMS), **Work4Sync**, successfully addresses key HR challenges faced by small to medium-sized enterprises (SMEs) through automation and centralization of processes.

- **Streamline HR Operations :** The system improves efficiency by automating critical tasks such as employee management, leave approvals, and payroll processing.
- **Enhanced Data Accuracy and Transparency :** By centralizing employee data and providing role-based access, the system reduces errors and ensures secure and clear access to HR information for both employees and HR personnel.
- **Improved Employee Experience :** Employees benefit from simplified leave request processes, access to real-time leave balances, and payroll history, fostering a user-friendly interaction with HR.
- **Actionable Insights :** The interactive dashboard provides concise, real-time summaries of essential HR metrics, empowering HR managers and business owners to monitor operations effectively and make data-driven decisions.

- **Cost and Time Savings :** Automating manual processes reduces administrative workloads, minimizes human error, and ultimately lowers operational costs.

Work4Sync addresses the immediate HR requirements of SMEs while offering a flexible and scalable framework to support future expansions and feature upgrades, ensuring alignment with organizational goals of efficiency, accuracy, and employee engagement.

Chapter 2

Proposed Architecture

This chapter describes the system architecture for the Human Resource Management System (HRMS). It includes requirement analysis, design specifications, use case and activity diagrams, user interface (UI) design, and an overall project plan.

2.1 Requirement Analysis & Design Specification

2.1.1 System Feature

This section outlines the functional requirements of the Human Resource Management System (HRMS) by detailing the major system features

User Management

Description and Priority

This feature manages user authentication and authorization within the system. It includes role-based access control, ensuring that HR personnel and employees have appropriate access to the system's features based on their roles.

Priority: High

Stimulus/Response Sequences

- **Stimulus:** An employee or HR personnel attempts to log in.
  - **Response :** The system verifies the credentials and grants access based on the user's role.
- **Stimulus:** HR personnel attempt to assign roles to a new employee.
  - **Response** : The system updates the user's access permissions accordingly.

Functional Requirements

- **REQ-1 :** The system must allow employees and HR personnel to log in using unique credentials.
- **REQ-2 :** The system must enforce role-based access control, restricting or granting access to features based on the user's role.
- **REQ-3 :** The system must allow HR personnel to manage user roles, including the ability to assign or modify roles.

Employee Information Management

Description and Priority
This feature handles the storage and management of employee personal details, bank information, salary information. It ensures that all employee data is accurately recorded and easily accessible for HR purposes.

Priority: High

Stimulus/Response Sequences

- **Stimulus:** HR personnel add a new employee to the system.
  - **Response:** The system stores the employee's personal details, bank information, and salary information.
- **Stimulus:** An HR personnel updates/deletes employee's personal information.
  - **Response**: The system validates and updates the employee's record accordingly.

Functional Requirements

- **REQ-1 :** The system must allow HR personnel to add, update, and delete employee records.
- **REQ-2 :** The system must store personal details, including name, contact information, and address.
- **REQ-4 :** The system must store and manage employee bank information for payroll purposes.

Leave Management Features

Description and Priority
This feature enables employees to request leave, manage approvals, track leave balances for the fiscal year, and maintain a detailed leave history. It simplifies the leave management process for both employees and HR.

Priority: High

Stimulus/Response Sequences

- **Stimulus:** An employee submits a leave request.
  - **Response:** The system processes the request and notifies the HR personnel for approval.
- **Stimulus:** HR personnel reviews and approves a leave request.

- **Response**: The system updates the employee's leave balance and records the approved leave.

Functional Requirements

- **REQ-1:** The system must allow employees to submit leave requests through the platform.
- **REQ-2:** The system must show HR personnel of pending leave requests for approval.
- **REQ-3:** The system must track and display leave balances for each employee.
- **REQ-4:** The system must maintain a history of all leave taken by employees

Interactive Dashboard

Description and Priority
This feature provides a visual overview of key HR metrics, such as employee headcount, leave statistics, and payroll summaries. The dashboard helps HR personnel quickly assess the overall status of the organization.

Priority: Medium

Stimulus/Response Sequences

- **Stimulus:** HR personnel access the dashboard.
  - **Response:** The system displays real-time aggregated data and visualizations based on available employee information.

Functional Requirements

- **REQ-1 :** The system must display key HR metrics, such as total employees, pending leave requests, and payroll summaries, on the dashboard.
- **REQ-3 :** The system must update the dashboard in real-time as new data is entered or processed.

Payroll Management

Description and Priority
This feature manages the payroll process, including salary calculations, deductions, bonuses, and the generation of payslips. It ensures accurate and timely salary disbursement for employees, along with the ability to track payment history.

Priority: Low

Stimulus/Response Sequences

- **Stimulus:** HR personnel initiate the payroll process.
    - **Response:** The system calculates salaries, applies deductions/bonuses, and generates payslips for employees.
- **Stimulus:** An employee views their payroll history.
    - **Response:** The system displays a detailed record of past payments, deductions, and bonuses for the employee.

Functional Requirements

- **REQ-1:** The system must allow HR personnel to calculate and process payroll, including deductions and bonuses.
- **REQ-2:** The system must generate payslips for each employee and store them for future reference.
- **REQ-3:** The system must allow employees to view their payroll history and access payslips.
- **REQ-4:** The system must ensure accurate payroll calculations based on employee salary, attendance, and other factors.

2.1.2 Proposed System Design

Use Case Diagram

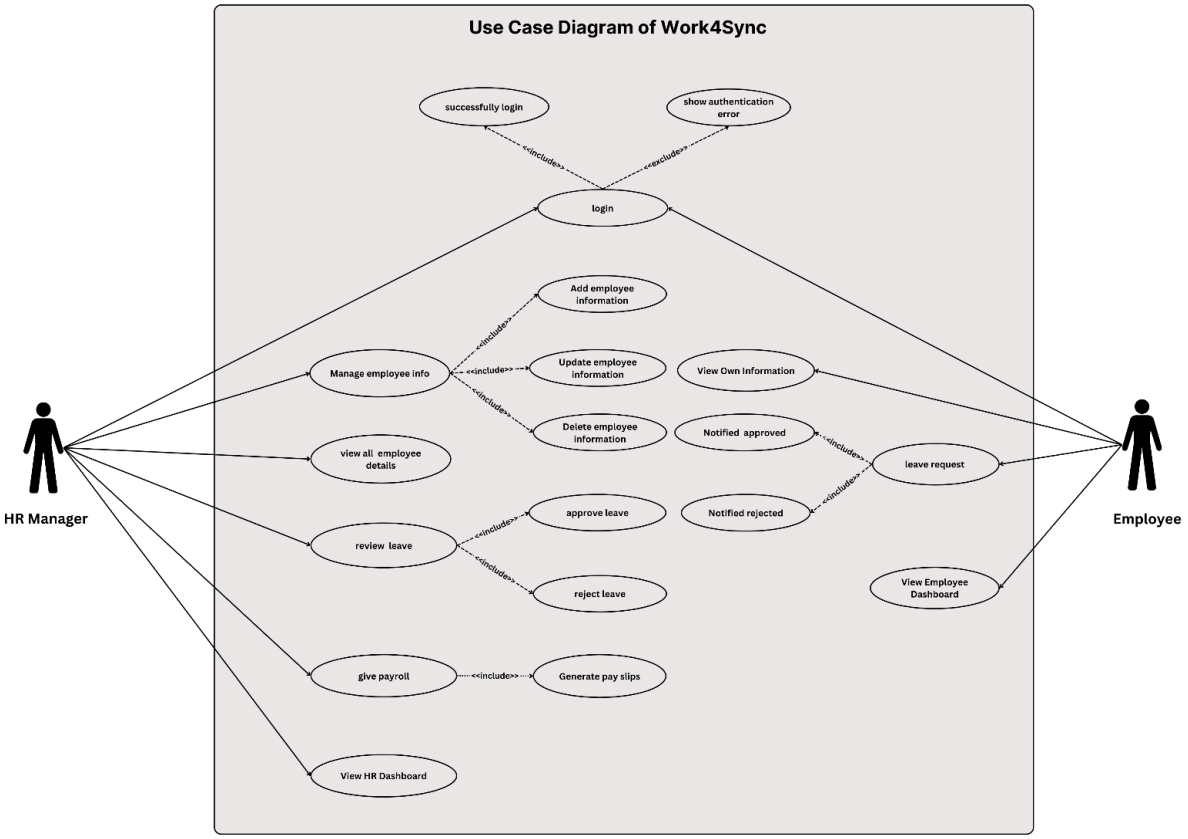


Figure 2.1: Use Case Diagram of Work4Sync

The Use Case diagram illustrates the workflow of the Work4Sync system with two primary actors: **HR Manager** and **Employee**. Employees log in to access their dashboard, manage their personal information, and submit leave requests. The system sends notifications for leave approvals or rejections. The HR Manager manages employee information, reviews leave requests, processes payroll, and accesses the HR dashboard. The leave requests are processed based on availability, and HR notifies employees of the final decision.

Activity Diagram

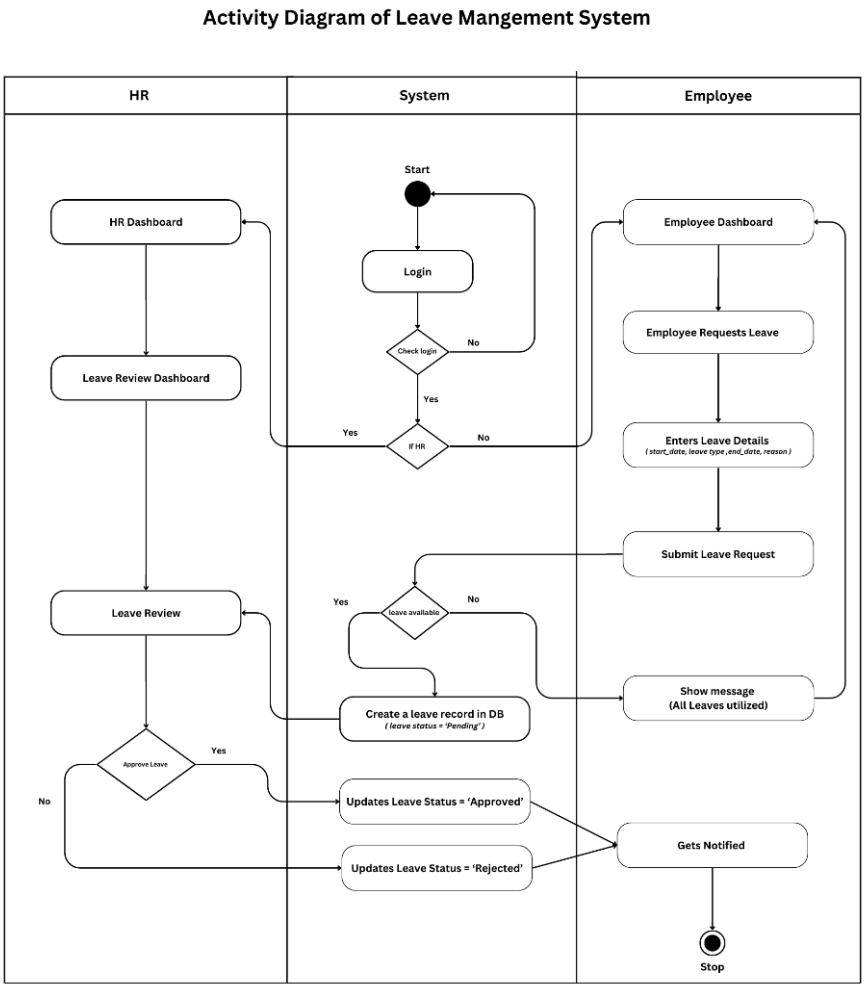
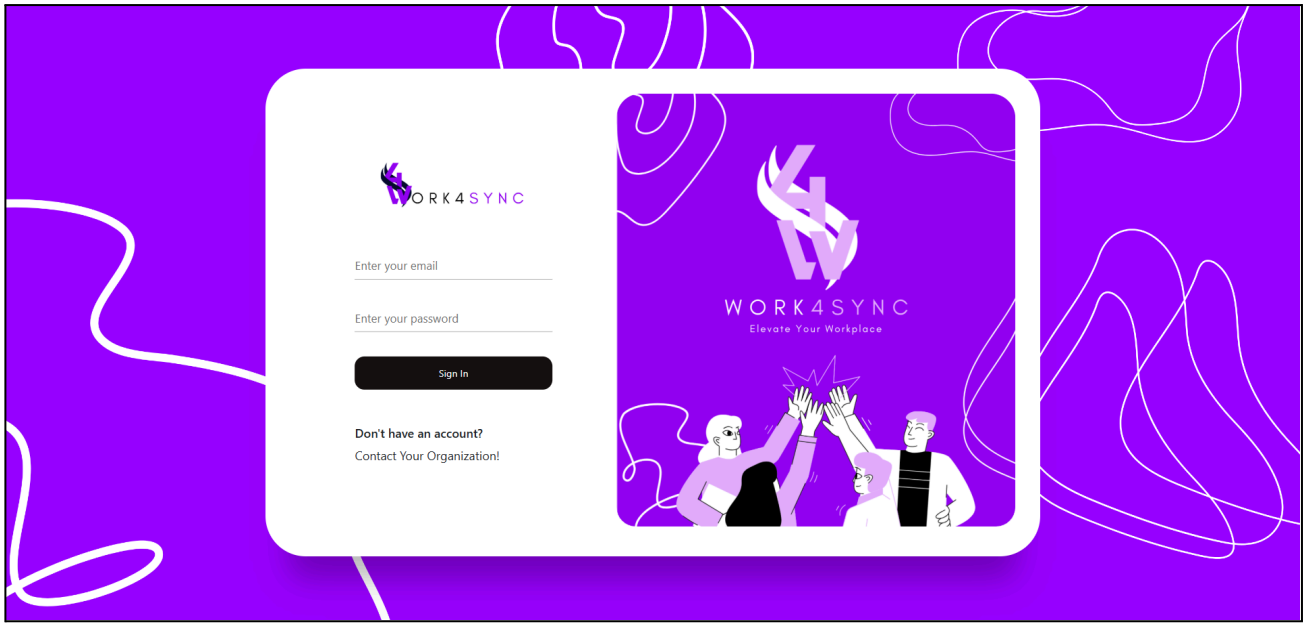


Figure 2.2 : Activity Diagram of Leave Management Feature

The activity diagram illustrated in Figure 2.2 shows the workflow of a Leave Management System. It includes three key actors: HR, the System, and the Employee. Employees log in to submit leave requests, specifying details like leave dates and reason. The system verifies if leave days are available, updating the database with a "Pending" status or displaying a message if no leave days remain. HR reviews the requests through the Leave Requests Page and either approves or rejects them, notifying the employee of the final status.

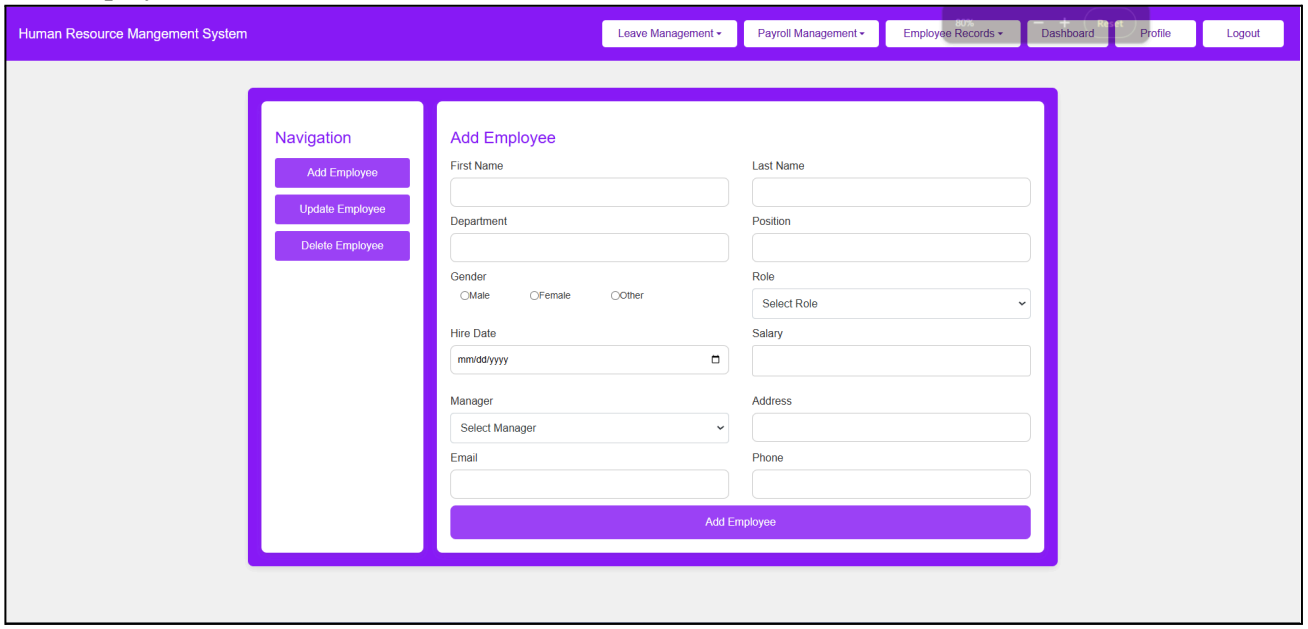
2.1.3 UI Design

Login Page

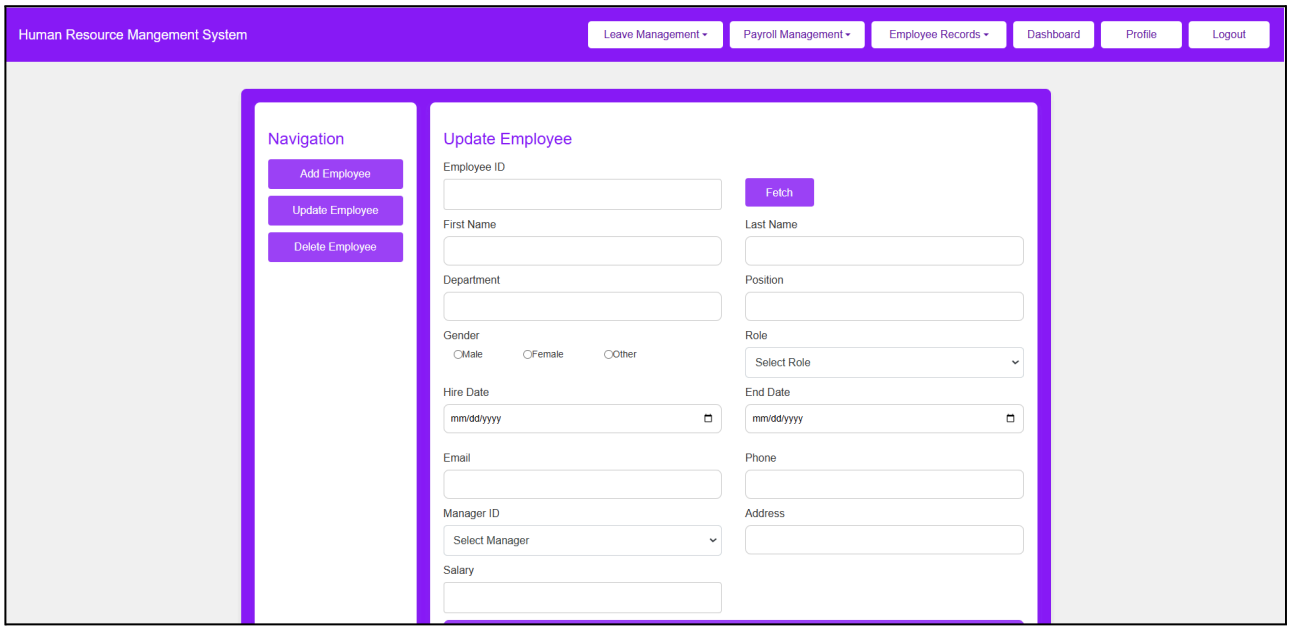


Employe Records

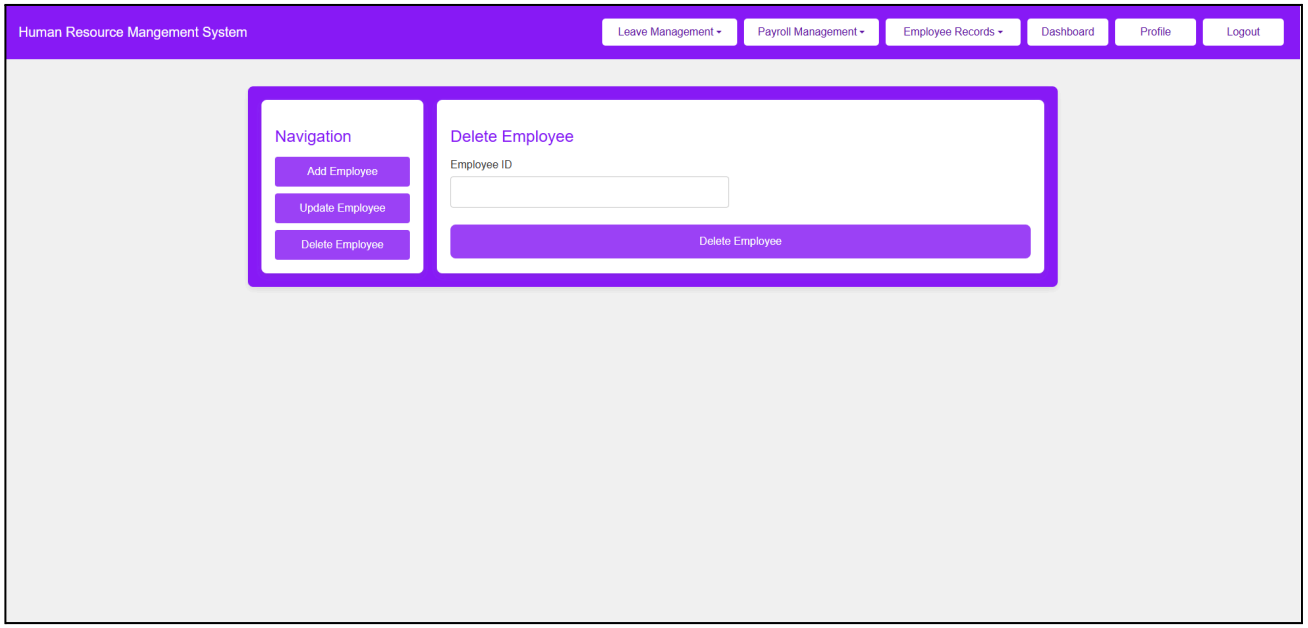
Add Employee Information



Update Employee Information

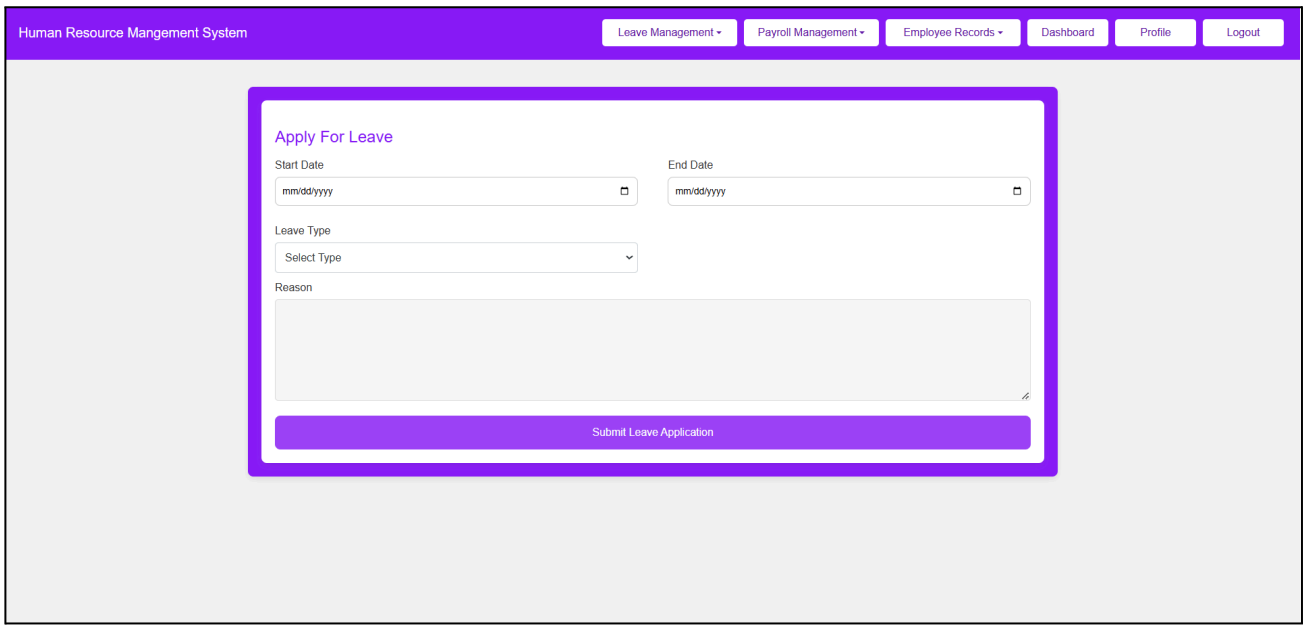


Delete Employee Information

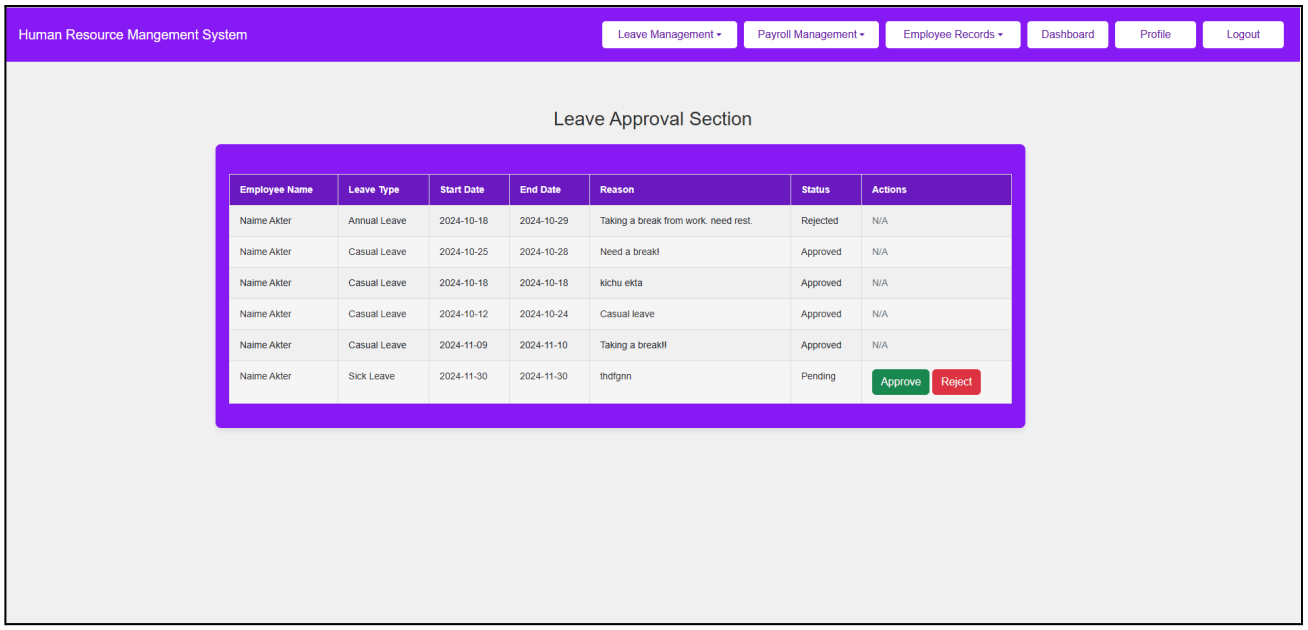


Leave Management

Apply Leave

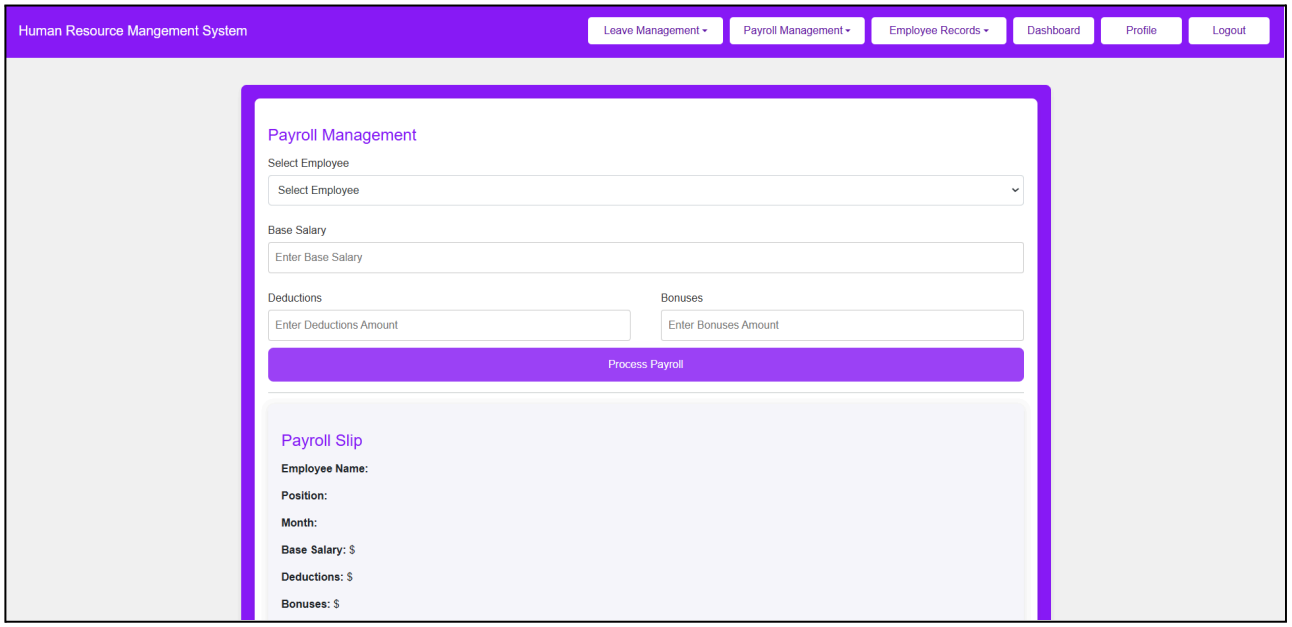


Approve/Reject Leave Request

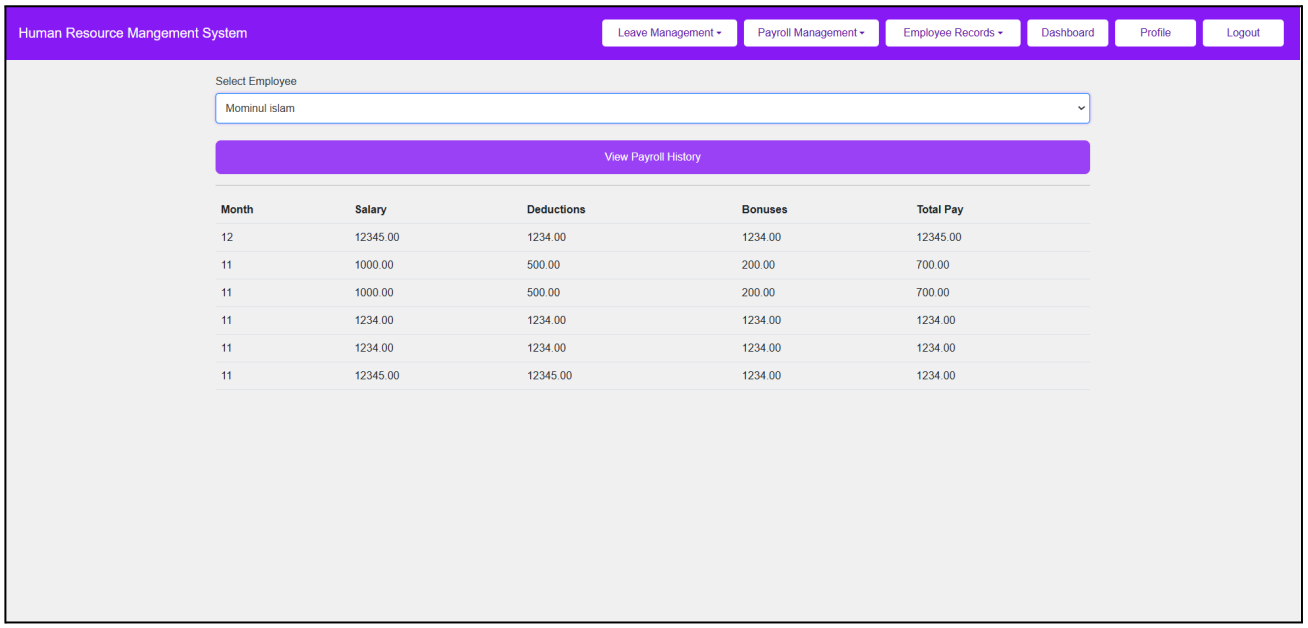


Payroll Management

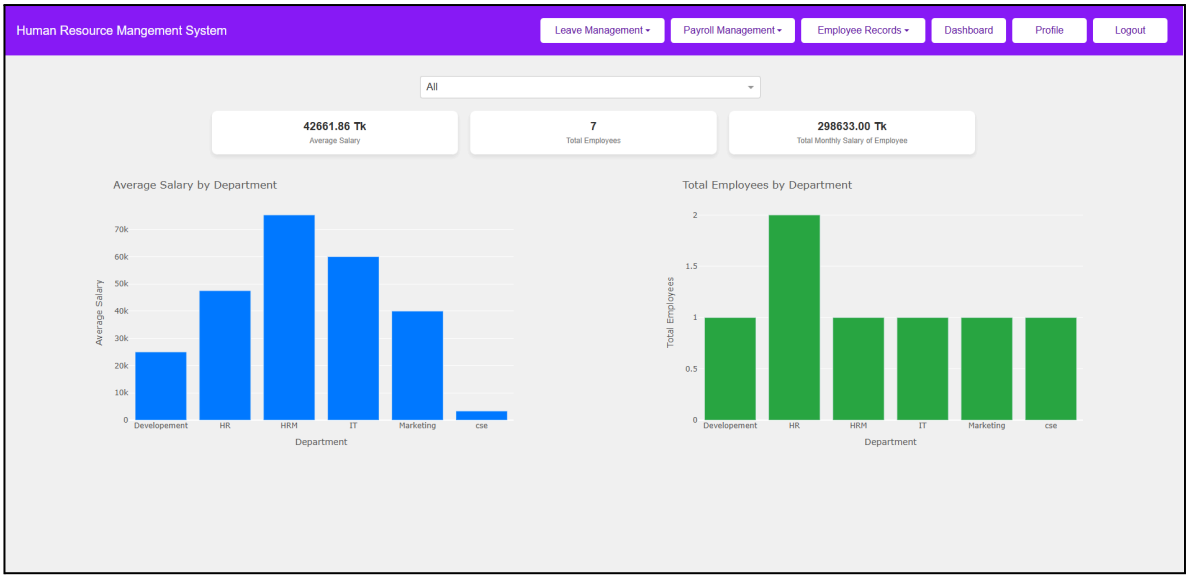
Give Payroll



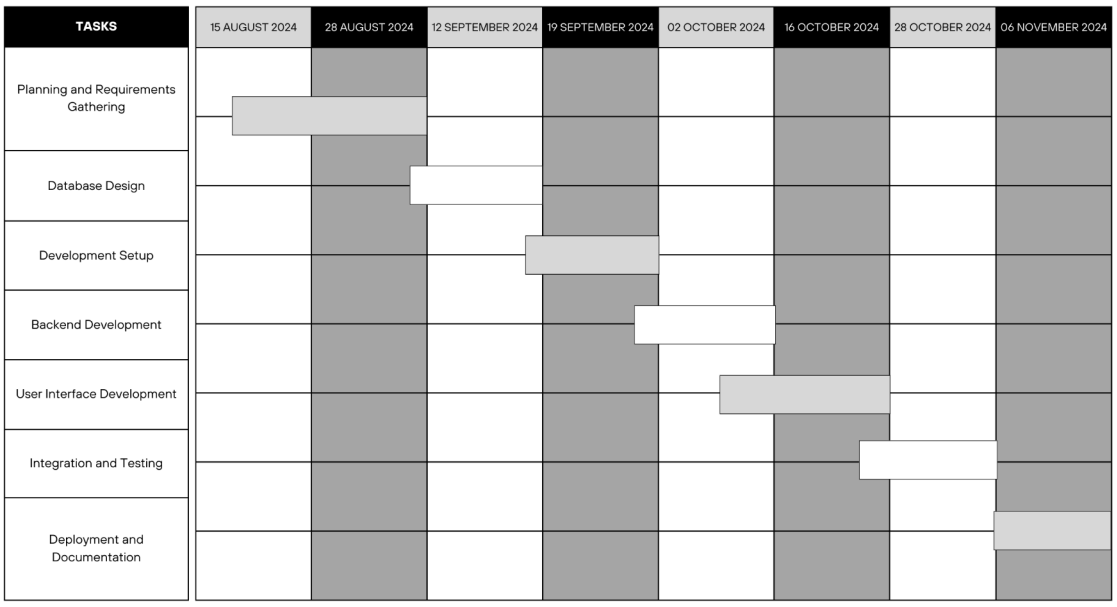
View Payroll History



Interactive Dashboard



2.2 Overall Project Plan



Phase	Start Date	End Date	Key Milestones
Design	September 8, 2024	September 16, 2024	Design finalized
Development	September 17, 2024	October 30, 2024	Core features implemented
Testing	October 31, 2024	November 6, 2024	Unit Testing, Manual Testing
Deployment	November 10, 2024	December 20, 2024	System Deployment to Cloud
Maintenance	December 21, 2024	Ongoing	Ongoing support updates and performance monitoring

Figure 2.3 : Gantt Chart of Project Timeline

Table 2.1 : Project Timeline

The Gantt Chart and project timeline illustrated Figure 2.3 and Table 2.1 shows the planned phase and milestone of the project. The **Design phase** spanned from September 8, 2024 to September 16, 2024 , where the final design was established. This is followed by the **Development phase** (September 17–October 30, 2024), focusing on implementing core features. The **Testing phase** occurred from October 31, 2024 to November 6, 2024, ensuring functionality through unit and manual testing. The **Deployment phase** (November 10–December 20, 2024) involves system deployment to the cloud. Lastly, the **Maintenance phase** (starting December 21, 2024) ensures continuous updates and performance monitoring. The timeline ensures timely and systematic completion of the project.

Chapter 3

Implementation and Results

This chapter describes the implementation process of the Human Resource Management System (HRMS), including module development, system workflow, and performance analysis. It also discusses the results obtained and their implications..

3.1 Implementation

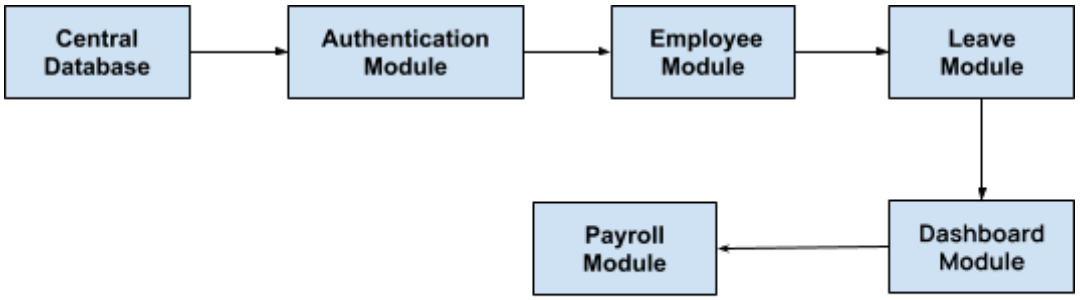


Figure 3.1 : Development Module Flow Diagram

The module flow diagram illustrates the system's workflow: the Central Database provides data to the Authentication Module, which directs verified users to the Employee Module. The Employee Module interacts with the Leave Module and the Dashboard Module, while the Payroll Module accesses data from the Dashboard.

3.2 Performance Analysis

The architecture of our Human Resource Management System (HRMS) is modular and constructed using the Flask micro framework, which offers enhanced performance compared to older bulk technologies. To evaluate the system's performance, we conducted testing using Insomnia, applying various loads to each API endpoint. The overall response time for requests was satisfactory, demonstrating that our application can handle multiple simultaneous requests without encountering

any performance issues.

3.3 Results and Discussion

The Work4Sync Human Resource Management System (HRMS) was developed to address the specific needs of small to medium-sized enterprises (SMEs) by automating and simplifying essential HR tasks, particularly in leave management and payroll tracking. This web-based solution centralizes HR processes, significantly enhancing both efficiency and accuracy. Traditional HR methods often lead to inefficiencies due to their manual nature, which can be time-consuming and prone to errors. By leveraging automation, Work4Sync aims to alleviate these challenges, ensuring greater transparency and ease of use for HR personnel and employees alike. The system is designed with an intuitive interface that simplifies navigation, making it accessible for users with varying levels of technical expertise. Additionally, Work4Sync supports scalability, allowing organizations to adapt as their needs evolve. Through its comprehensive functionality, the HRMS not only streamlines operations but also contributes to improved decision-making and compliance with HR policies. The gap analysis conducted against existing solutions like BambooHR and Zenefits reveals that Work4Sync offers a more user-friendly interface while incorporating advanced analytics features that enhance data visualization and operational insights. Overall, the implementation of Work4Sync is expected to lead to significant cost savings and time efficiencies for SMEs, ultimately supporting their growth and development in a competitive market.

Chapter 4

Engineering Standards and Mapping

This chapter explores the engineering standards followed during the development of the HRMS, along with its societal, environmental, and ethical impacts.

4.1 Impact on Society & Environment

4.1.1 Impact on Life

The **Work4Sync HRMS** will improve the employee experience by providing easy access to leave and payroll management, ensuring transparent tracking. HR managers will benefit from real-time metrics and the automation of routine tasks, enabling better decision-making. The system will enhance operational efficiency by reducing administrative workload, lowering costs, and minimizing errors. It will also save time and reduce payroll mistakes, making processes faster and more reliable. As the business grows, Work4Sync will support scalability, handling more users and data. Additionally, it ensures secure data storage and simplifies compliance with HR laws and regulations.

4.1.2 Impact on Society & Environment

Impact on Society:

It improves HR efficiency by automating tasks like leave management and payroll, allowing HR to focus on strategic work. Employees benefit from easier access to leave and payroll information, boosting satisfaction. The system ensures data accuracy and transparency, building trust, and supports business growth by allowing SMEs to scale effectively.

Impact on Environment:

Work4Sync reduces paper use by digitizing HR processes and promotes energy efficiency with a web-based solution. It also supports remote work, reducing commuting and greenhouse gas emissions.

4.1.3 Ethical Aspects

The development and use of a Human Resource Management System (HRMS) should follow ethical principles to ensure fairness, transparency, and security in managing employee data. Key considerations include,

- **Data Privacy and Security**: Protect sensitive employee information through encryption and secure access, complying with data protection laws like GDPR (General Data Protection Regulation).
- **Fairness and Non-Discrimination**: Ensure unbiased decisions in processes like leave approvals and payroll, avoiding discrimination.
- **Transparency**: Provide employees with clear access to their leave balances, payroll, and other data, building trust.
- **Accountability**: Maintain an audit trail of actions within the system to ensure responsible usage.

4.2 Complex Engineering Problem

4.2.1 Mapping of Program Outcome

Table 4.1: Justification of Program Outcomes

CO	CO Description	PO
CO1	Understand software architecture's pivotal role in project success.	PO1
CO2	Translate customer requirements into effective software designs.	PO3
CO3	Develop user-friendly frontend components using suitable technologies.	PO4
CO4	Utilize version control for collaborative software development.	PO4

4.2.2 Complex Problem Solving

Table 4.2: Mapping with complex problem solving.

EP1 Dept of Knowledge	**EP2** Range of Conflicting Requirements	**EP3** Depth of Analysis	**EP4** Familiarity of Issues	**EP5** Extent of Applicable Codes	**EP6** Extent Of Stakeholder Involvement	**EP7** Inter-dependence
✓	✓	✓				✓

Justification:

1. EP1 has been achieved through applying the engineering fundamental and specialized knowledge (K3, K4). We also need engineering design knowledge in this project (K5, K6).
2. EP2 has been achieved as we have to consider the design constraints over the backend development in this project.
3. EP3 , we need a depth of analysis when we have collected the requirements for our project. It requires thorough analysis what is the UI requirements to ensure the usability of the project.
4. EP7 , achieved through team collaboration across frontend and backend development, using tools like GitHub and agile methodologies to ensure seamless integration of our project components.

4.2.3 Engineering Activities

Table 4.3: Mapping with complex engineering activities.

EA1 Range of resources	**EA2** Level of Interaction	**EA3** Innovation	**EA4** Consequences for society and environment	**EA5** Familiarity
✓		✓	✓	✓

Chapter 5

Conclusion

This chapter summarizes the key findings and outcomes of the Work4Sync Human Resource Management System (HRMS) project, discusses its limitations, and outlines potential directions for future work.

5.1 Summary

The Work4Sync HRMS is a web-based system designed to streamline HR processes for SMEs, focusing on leave management and payroll tracking. It automates tasks to enhance efficiency, accuracy, and transparency, reducing manual errors and administrative workloads. The system offers key features like user management, employee information management, leave management, payroll management, and an interactive dashboard. It addresses gaps in current HR solutions, such as complex interfaces and limited mobile functionality, and aims to improve user experience and operational efficiency. The system also ensures scalability, security, and compliance with HR policies.Future work will include mobile functionality, enhanced analytics, and advanced security features.

5.2 Limitation

Despite its strengths, the Work4Sync HRMS has some limitations. The initial version does not include dedicated mobile applications, which may limit accessibility for users who prefer mobile interfaces. Additionally, while the system offers comprehensive features for leave management and payroll processing, further enhancements in data security and integration with third-party tools are necessary to meet evolving industry standards. User feedback during the early stages of deployment will be crucial in identifying areas for improvement.

5.3 Future Work

Future developments for Work4Sync should focus on addressing the identified limitations and expanding its capabilities. Key areas for future work include:

- **Mobile Application Development :** Creating a mobile version of the HRMS to enhance accessibility for users on-the-go.

- **Enhanced Security Measures :** Implementing advanced encryption technologies to safeguard sensitive employee data.
- **Integration with Third-Party Tools :** Facilitating connections with other software solutions to streamline workflows and improve functionality.
- **User Feedback Incorporation :** Regularly updating the system based on user feedback to refine features and enhance user experience.

By prioritizing these areas, Work4Sync can continue to evolve as a competitive solution in the HR technology market, supporting SMEs in their growth and operational efficiency.

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