PREMIER UNIVERSITY CHITTAGONG
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

A Project Report On

EMPLOYEE MANAGEMENT SYSTEM

Course Title: Software Development
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Abstract

The Employee Management System (EMS) is a distributed application designed to efficiently manage the personal and professional details of employees in an organization. The system handles key HR functions such as payroll, leave management, and employee profiles. Developed using PHP and the Laravel framework, with MySQL as the database, it ensures fast performance and ease of use. The front-end leverages HTML, CSS, and Bootstrap to offer a user-friendly interface that is accessible even to users unfamiliar with complex systems. EMS is modular, consisting of roles like Employee, Admin, and Manager, enabling role-based access and functionality. This system streamlines HR operations, enhances productivity, and provides a comprehensive solution for managing employee-related tasks in real time.

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1. Introduction

The Employee Management System (EMS) is designed to manage employee data efficiently within an organization, overcoming the limitations of manual systems [1]. It stores essential information, such as employee personal details, salary data, and leave records, providing managers with better oversight and enabling effective planning and cost management to improve productivity.

The EMS also secures sensitive employee data and simplifies access to personal and work-related information. Developed using PHP Laravel with MySQL as the back-end, and a user-friendly interface built with HTML, CSS, and Bootstrap, it offers flexibility and scalability for businesses of all sizes [2]. The role-based access structure ensures employees, managers, and administrators can interact with the system as per their roles, enhancing security and efficiency [3]. By automating manual tasks, the EMS reduces errors and delays, providing a modern solution to streamline human resource management in organizations.

2. Problem Statement

Managing employee data and payroll manually creates several issues. Paperwork takes time and often leads to mistakes [4]. Managers find it hard to track attendance, update work schedules, and process leave requests, causing delays and confusion for employees [4]. Manual salary calculations take a lot of time, leading to late payments and unhappy employees [5]. These inefficiencies can result in lower productivity and poor employee satisfaction, which can affect overall company performance.

The current system also wastes time and storage space, making it slow and inefficient to update or find employee information [4]. As companies grow, handling large amounts of data becomes even more difficult. To fix these problems, businesses need an automated solution that handles tasks like attendance tracking, salary calculation, and leave management. This would help reduce mistakes and speed up processes, improving the overall efficiency of the organization [3]. A computerized Employee Management System can ensure accurate pay, timely salary distribution, and better communication between managers and employees, fostering a more organized and productive work environment [5].

2.1. Motivation

The primary motivation for developing the Employee Management System (EMS) is to address the inefficiencies of manual employee data management. In many organizations, managing records such as employee details, attendance, leave status, and payroll is a time-consuming process [4]. The manual system makes it difficult for employees to access important information, like their leave balance or payslips, and HR departments spend excessive time handling paperwork and performing repetitive tasks.

The proposed EMS automates these processes, offering several advantages over the traditional manual system. It allows businesses to manage employee information online, making the system user-friendly and accessible from any location [2]. Additionally, it reduces the complexity of managing employee data, minimizes paperwork, and enables easy storage and retrieval of information [4]. This project aims to enhance operational efficiency and improve communication between employees and management.

3. Objective

The main objective of this project of Employee Management System (EMS):

- Ensure secure access to the EMS through a role-based authentication system for admins and employees.
- This project aims to simplify the task maintaining records of the employees of company.
- To develop a well-designed database to store employee information.
- Improve efficiency and reduce paperwork
- Automate and accurately track employee attendance to reduce manual errors.
- Add, update and delete the records of an employee.
- Streamline payroll processing for timely and accurate salary calculations based on attendance data.

4. Methodology

4.1. Requirement identification

The Employee Management System is designed to help organizations manage their employees more effectively [2]. It includes key features such as storing and updating employee information, tracking attendance, managing payments, handling projects and tasks, and processing leave requests. The system allows different users, like employees, managers, and administrators, to have specific roles and permissions [2]. It securely stores data, makes it easy to access information, and generates reports to assist in decision-making. The system should be simple to use, able to grow with the company, and work well with other tools to improve overall efficiency [1].

4.1.1. Literature Review

The Employee Management System (EMS) has been discussed in many studies for its role in improving how companies manage their employees. Researchers have highlighted how EMS helps with tasks like tracking attendance, calculating salaries, and managing employee tasks [5]. Recent features, such as tracking total hours worked and giving an overview of assigned tasks, have become important for keeping an eye on employee productivity. Studies also point out that flexible task assignment and accurate salary calculations make management easier and more efficient [4]. By combining attendance records with payroll and task details, managers can get a clear picture of employee performance, which helps them make better decisions and avoid mistakes.

These systems also improve transparency, communication, and accountability in the workplace. With their ability to create reports and give useful insights, EMS plays a key role in planning and improving workforce management [1]. The features in our project—tracking hours worked, post lists, task overviews, creating new tasks, salary calculation, and attendance—are valuable tools that fit with these developments, helping to make operations smoother, boost productivity, and simplify management [5].

4.1.2. Requirement Analysis

The development of the Employee Management System (EMS) requires a detailed understanding of specific project requirements to ensure its effective implementation.

4.1.2.1 Technical Requirements

- **Database Management:** A robust database is essential to store all kind of information of this project.
- **Security:** Secure authentication and authorization are critical. Sensitive data such as employee details and salary information must be encrypted and protected from unauthorized access.
- **Scalability:** The system must handle a growing number of employees and increased data.
- **Performance:** The system should provide fast responses to user queries, even when managing large datasets or generating reports.

4.1.2.2 Operational Requirements

- **User Roles and Permissions:** Employees, managers, and administrators should have specific access to functionalities such as viewing tasks, updating information, or managing payroll.
- **Attendance Tracking:** The system must accurately record attendance and work hours.
- **Task Management:** Managers should assign, track, and evaluate tasks, while employees should view and manage their tasks easily.
- **Payroll Processing:** Salary calculations based on hours worked, leave, and other factors should be automated to reduce errors.

4.1.2.3 User Requirements

- **User-Friendly Interface:** The system should be simple and intuitive, ensuring both technical and non-technical users can easily access and use its features.
- **Notifications and Alerts:** The system should notify users about task deadlines, approvals, and payroll updates.

4.1.2.4 Constraints

- **Budget:** The project must stay within budget, considering hosting, development, and maintenance costs.
- **Timeline:** Development and deployment must meet the given deadlines, which may impact the inclusion of certain features.

4.2. Feasibility Study

4.2.1. Technical

The technical feasibility assesses whether the Employee Management System can be successfully developed with the available tools, technology, and expertise. The project will require a development environment that supports PHP, Laravel, MySQL, HTML, CSS, and Bootstrap. Given that these technologies are widely available and the necessary development skills (web development, database management, and user interface design) are within reach, the project is technically feasible. Compatibility with existing systems, such as employee databases or payroll systems, can also be managed through the Laravel framework's flexibility..

4.2.2. Operational

For operational feasibility, user acceptance and organizational support will be key. The Employee Management System is designed to address the need for efficient management of employee records, payroll, attendance, and tasks. Its user-friendly interface and mobile compatibility for attendance tracking will encourage user acceptance. Additionally, the system's ability to improve data accuracy and automate tasks like salary calculation will receive strong organizational support. Compatibility with current systems or processes will need to be ensured, and any operational challenges, like user training, can be addressed with proper on-boarding procedures.

4.2.3. Economic

A cost-benefit analysis for the Employee Management System (EMS) shows that while the project will have upfront costs like hosting, design, and testing, as well as ongoing costs for updates and user support, the long-term benefits are much greater. The system will save time on manual tasks, reduce mistakes in payroll, and boost overall productivity. These improvements will result in cost savings and better management of employees, making the project a good investment and financially worthwhile.

Item	**Description**	**Cost ($)**	**Benefit ($)**
Development Costs	Software Development	14,000	-
Hardware Costs	Servers and Equipment	10,000	-
Training Costs	User Training Sessions	5,000	-
Maintenance Costs	Monthly Maintenance	200	-
Testing and QA Costs	Bug-free and secure	4,000	-
Hosting Costs	Monthly cloud service	300	-
Total Costs		**33,500**	-
Savings from Reduced Manual Efforts	Time Savings	-	5,000
Increased Efficiency and Productivity	-	-	2,500
Indirect Benefits	-	-	1000
Total Benefits		-	**8,500**
Monthly Net Benefit		**8,500 - 500**	**8,000**

Table 4.1: Cost-Benefit Analysis of the Employee Management System Project

For cost-benefit analysis, we have some methods, but here we use the 'Net Present Value' method using $\frac{x}{(1+r)^n}$ formula. Here, x = net benefit, n = month, r = 10%

It's table of Present value method-

Month	**Cost**	**Net-Benefit**	**Present Value of Benefit**	**Cumulative Benefit**
0	$33,500	$0	$0	
1		$8,000	$7,272.7273	$7,272.7273
2		$8,000	$6,611.5703	$13,884.2976
3		$8,000	$6,010.5185	$19,894.8161
4		$8,000	$5,464.1077	$25,358.9238
5		$8,000	$4,967.3706	$30,326.2944
6		$8,000	$4,515.7915	$34,842.0859

Table 4.2: Cost-Benefit Analysis with Present Value Method

The costs will be recovered in under six months.

4.2.4. Schedule(Gantt chart showing the project timeline)

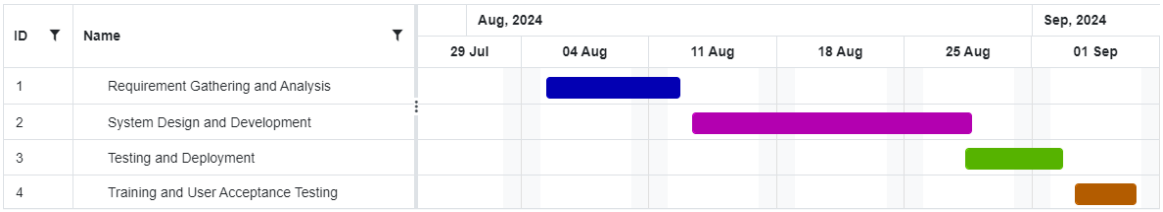

Figure 4.1: Gantt Chart demonstrating schedule feasibility

4.3. High-Level Design of System

System architecture refers to the high-level structure and organization of a complex system, outlining the relationships and interactions between its components. It serves as a blueprint for designing, building, and maintaining a system, providing a framework that guides the development process.

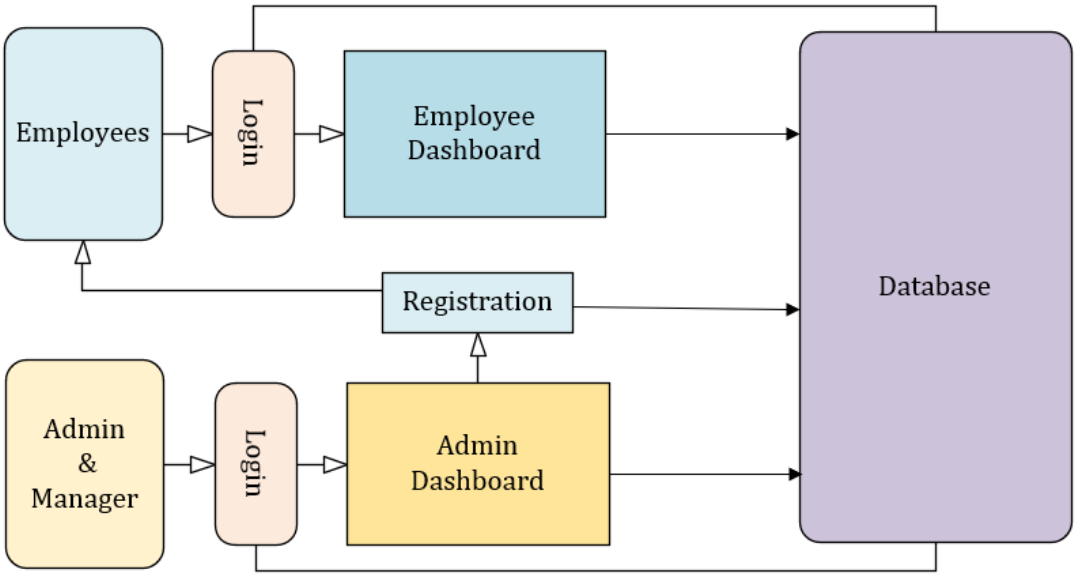

Figure 4.2: System Architecture diagram for Employee Management System

4.3.1. Methodology of the proposed system

The proposed system is a web-based Employee Management System designed to be used on smartphones with an internet connection. It aims to enhance efficiency in managing employee information and processes through the following key features:

- **Employee Management**: The system allows employers to add, update, or remove employee details. Once entered, past holidays are fixed and cannot be edited, ensuring historical accuracy [5].
- **Salary Processing**: Employers can easily calculate and view each employee's salary for the previous month using the "Get Salary" feature [5].
- **Attendance Management**: Employees record their attendance once per day by scanning QR codes when entering and leaving the facility. For those without smartphones, employers can manually mark attendance on their behalf, ensuring accurate tracking [5].
- **Data Management**: The system centralizes and organizes employee records, including personal details, education, skills, and projects. This centralization improves data accessibility and reduces the likelihood of errors [3].

By solving common problems in manual systems, like misplaced files and poor record-keeping, the proposed system provides a complete solution for managing employee data. It boosts productivity and ensures secure, accurate operations.

4.3.2. Flow Chart

A flowchart is a simple diagram that shows the steps in a process. It uses shapes like rectangles and arrows to display how tasks are connected. In the Employee Management System, the flowchart shows how users like admin and employees use the system, such as logging in, managing tasks, tracking attendance, and processing salaries. It helps to make the system easier to understand by visually showing each step.

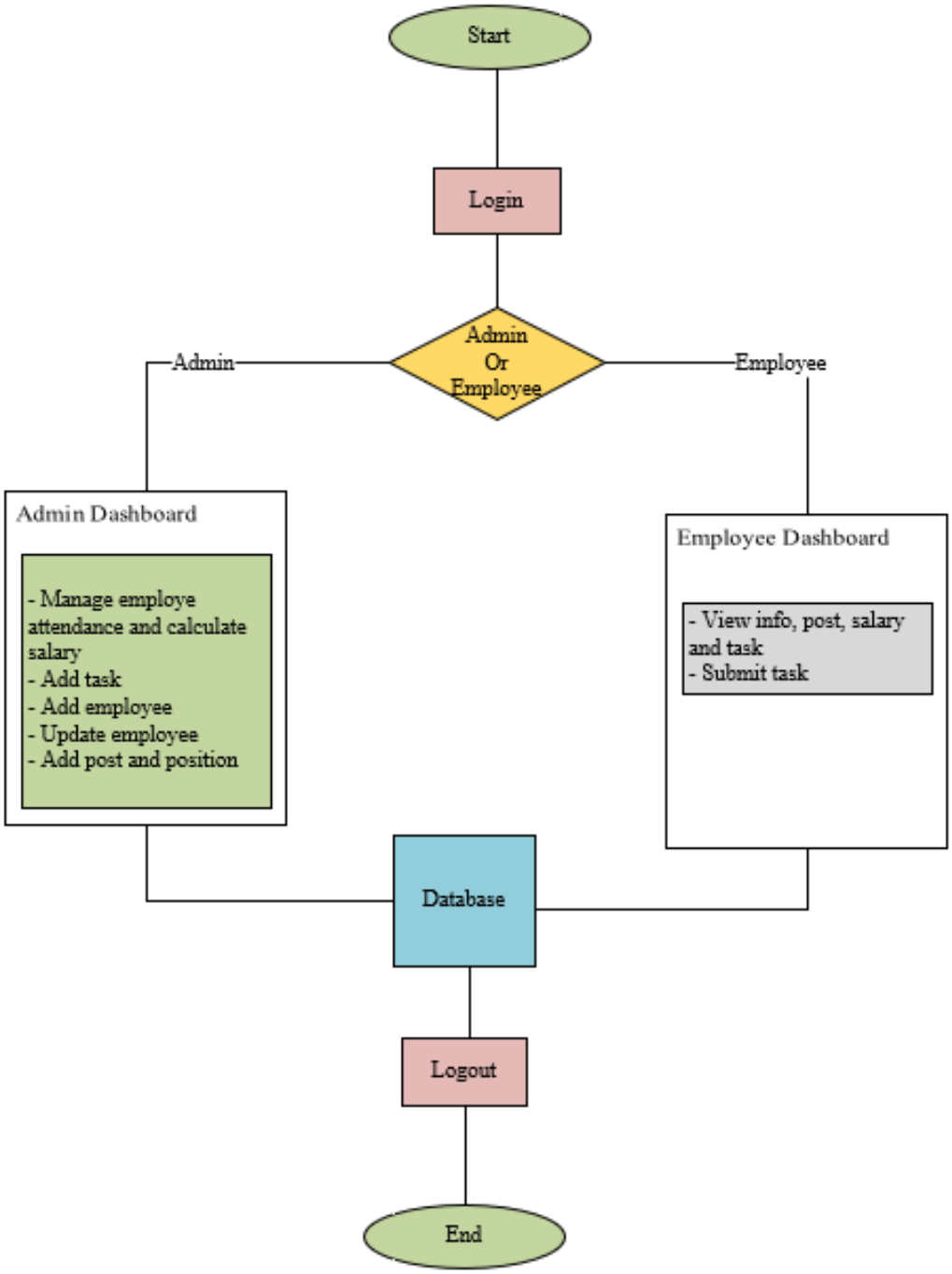

Figure 4.3: Flowchart diagram for Employee Management System

4.3.3. ER Diagram

A case diagram represents the functionality and requirements of a system or an application using actors. Mainly It is a model that shows the functions and services required by a system It represents the higher level The functions, activities, administration and powers that the structure must perform.

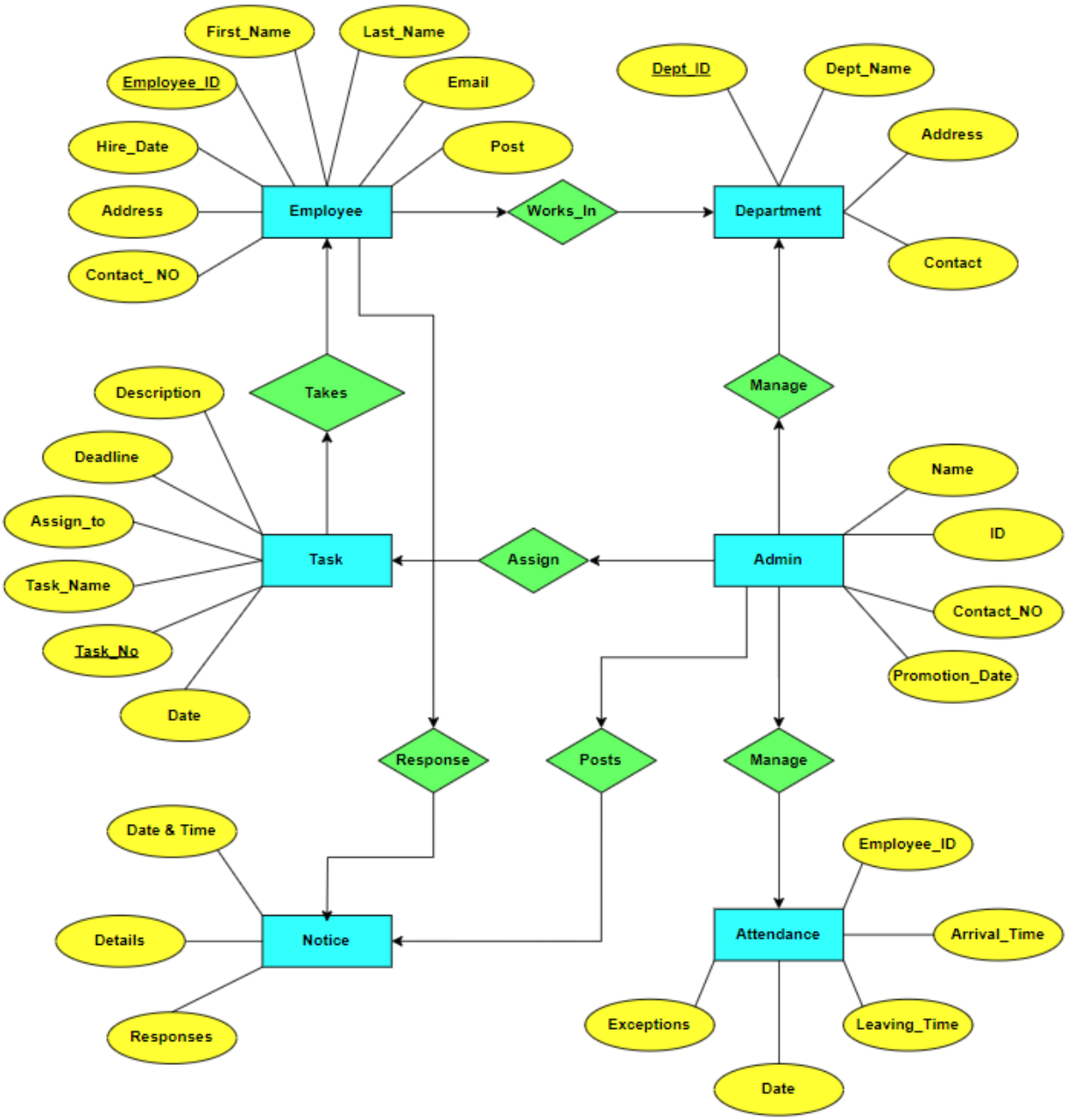

Figure 4.4: ER diagram for Employee Management System

4.3.4. UML Use Case Diagram

A case diagram represents the functionality and requirements of a system or an application using actors. Mainly It is a model that shows the functions and services required by a system It represents the higher level The functions, activities, administration and powers that the structure must perform.

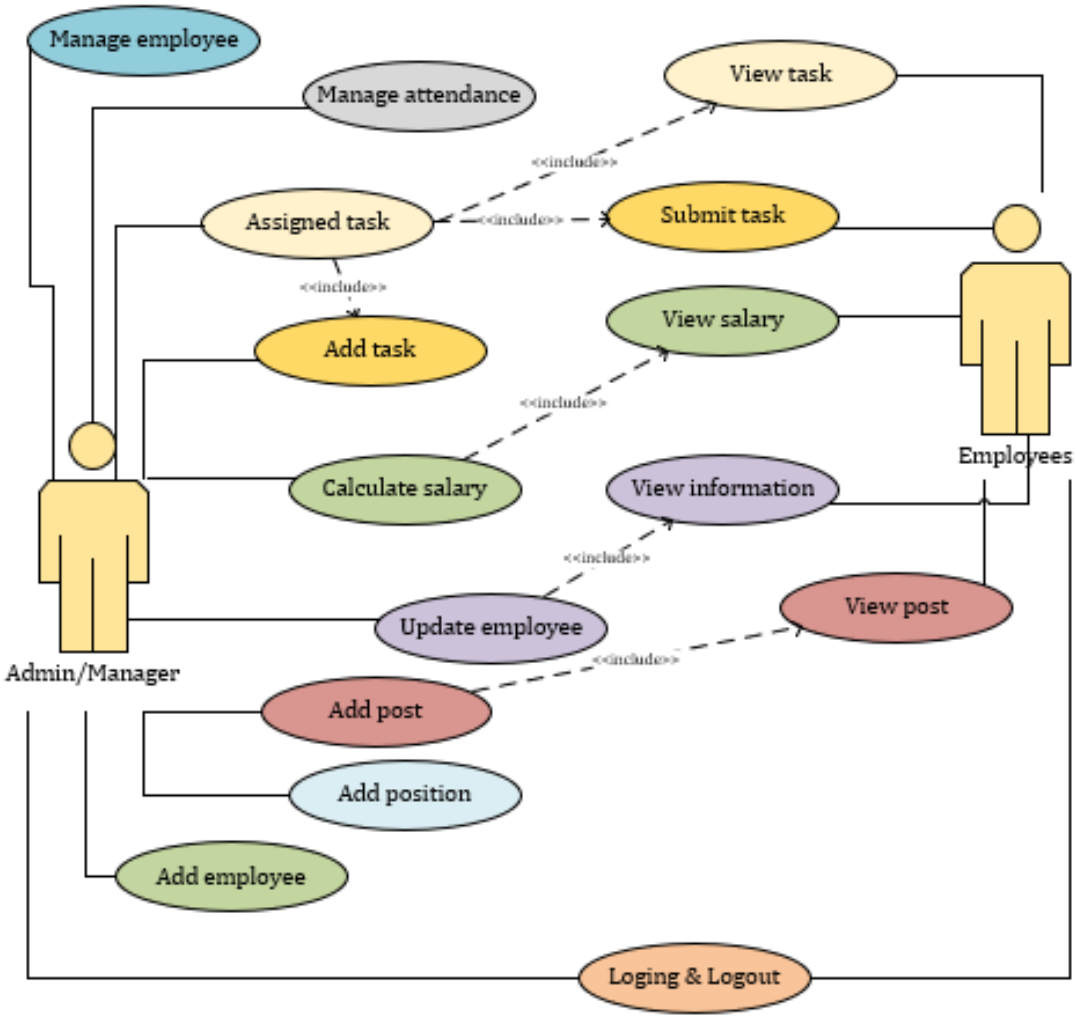

Figure 4.5: UML Use Case diagram for Employee Management System

4.3.5. Activity Diagram

An activity diagram represent the behavior of a diagram. It portrays the conduct of a framework or the behavior of an application. The diagram shows the control flow from start point to a end point showing the various decision paths.

4.3.5.1 Activity diagram for Admin:

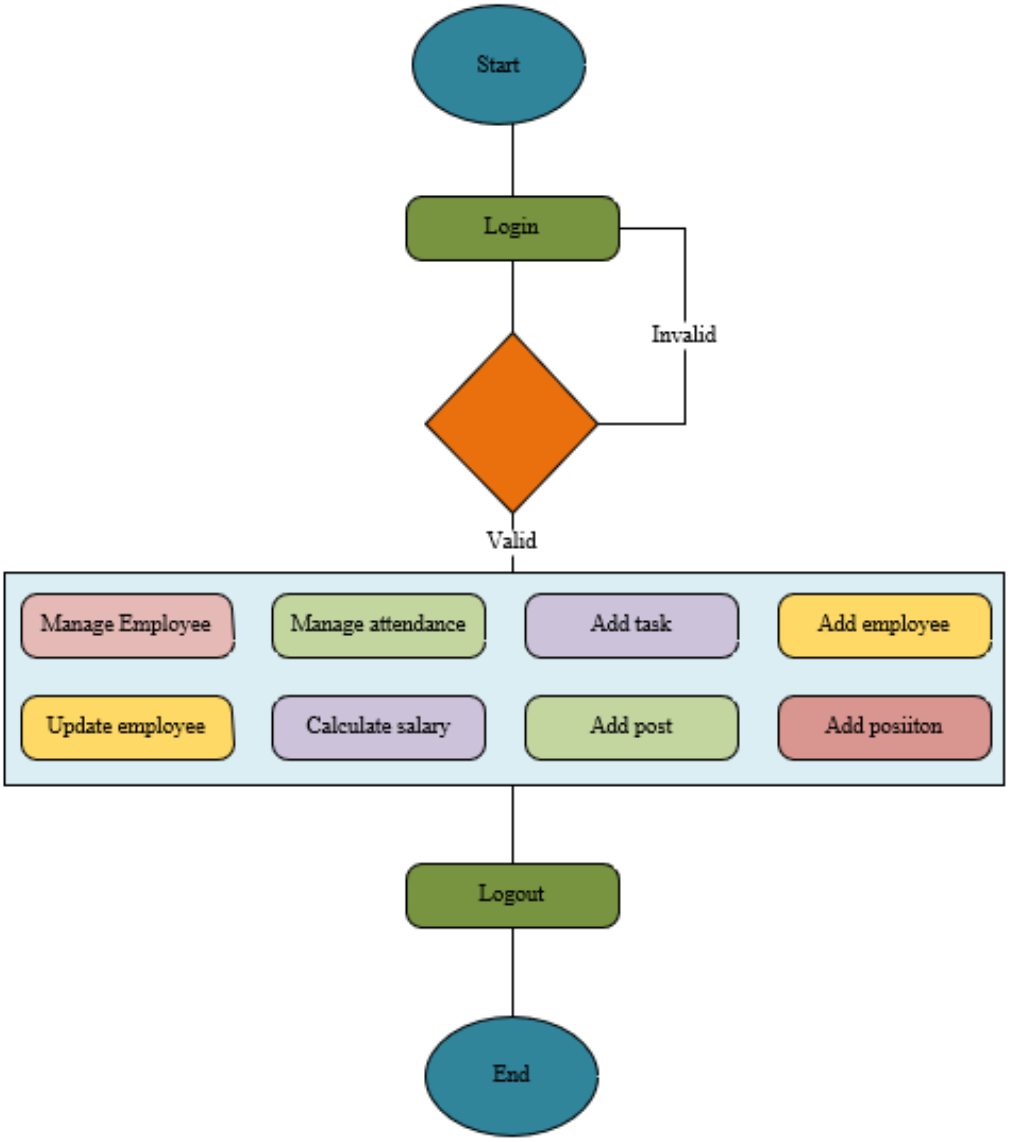

Figure 4.6: Activity diagram of Admin for Employee Management System

4.3.5.2 Activity diagram for Employee:

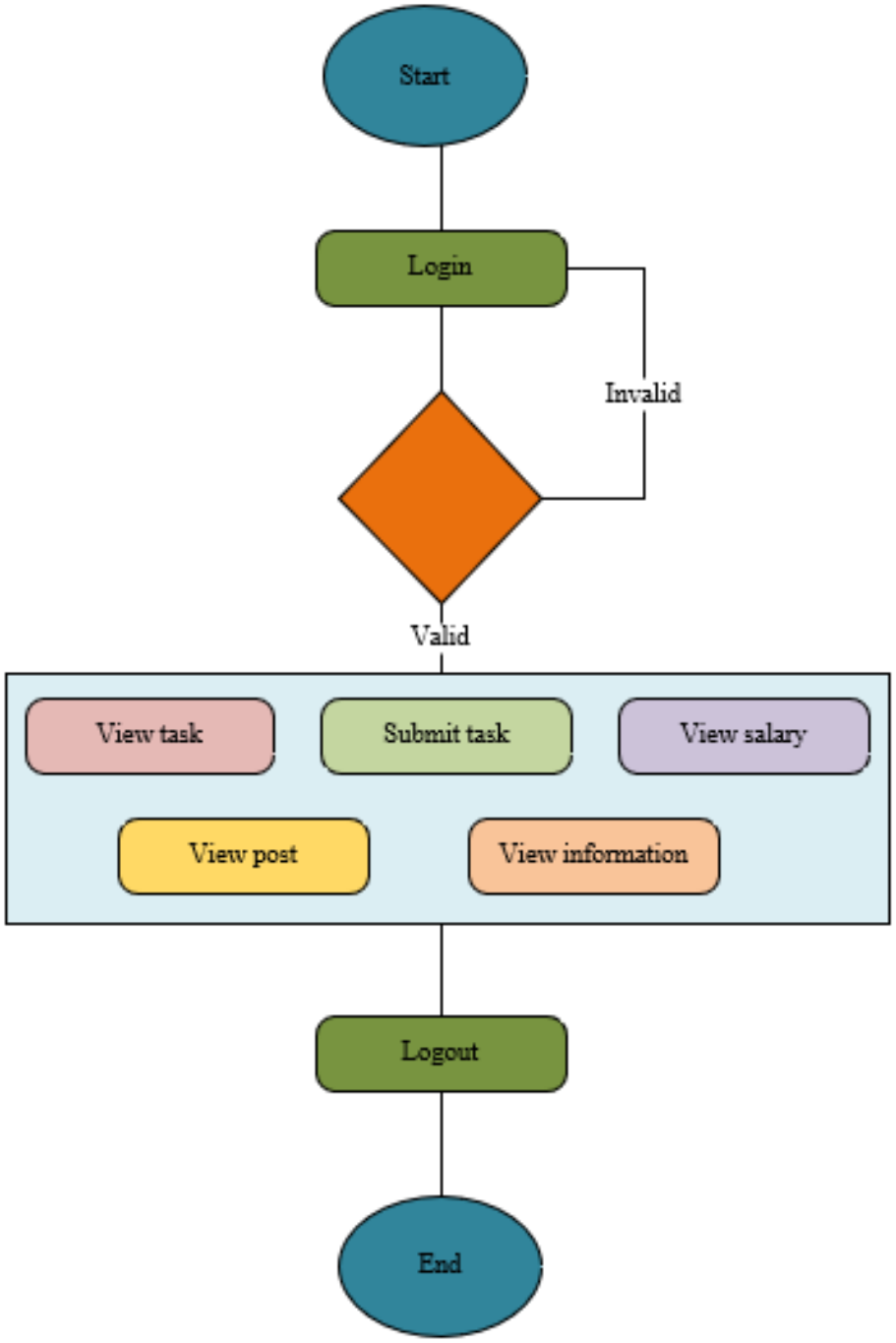

Figure 4.7: Activity diagram of employee for Employee Management System

4.3.6. Sequence Diagram

A sequence diagram basically depicts the interactions between objects in a sequential order in which these interactions occur. For example: requests where these associations occur Sequence diagrams describe the sequence of objects in a system function. Basically, sequence diagrams are used by web developers, software developers and business purposes to understand the existing process requirements of a system.

4.3.6.1 Sequence diagram for Employee:

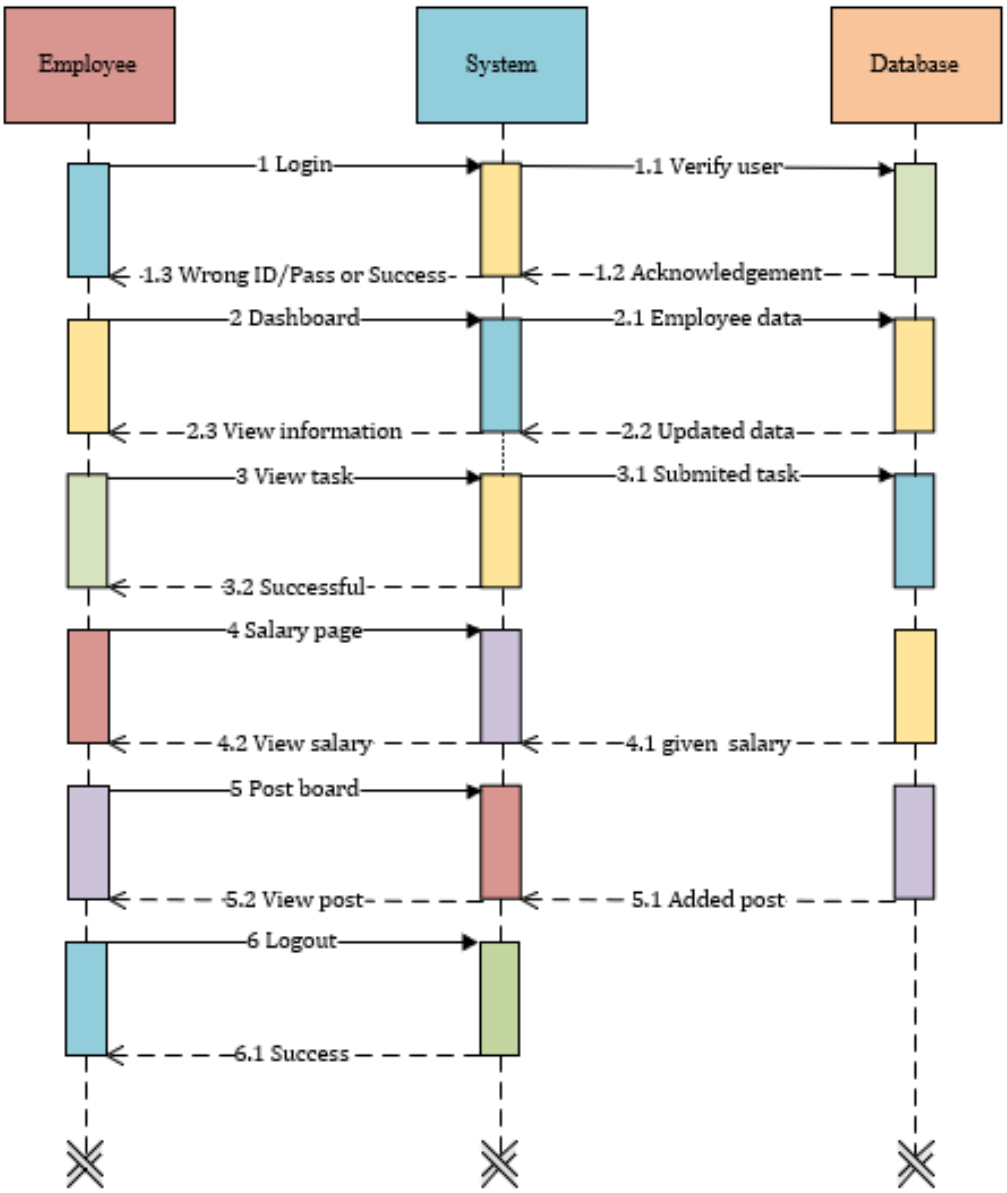

Figure 4.8: Activity diagram of Employee for Employee Management System

4.3.6.2 Sequence diagram for Admin:

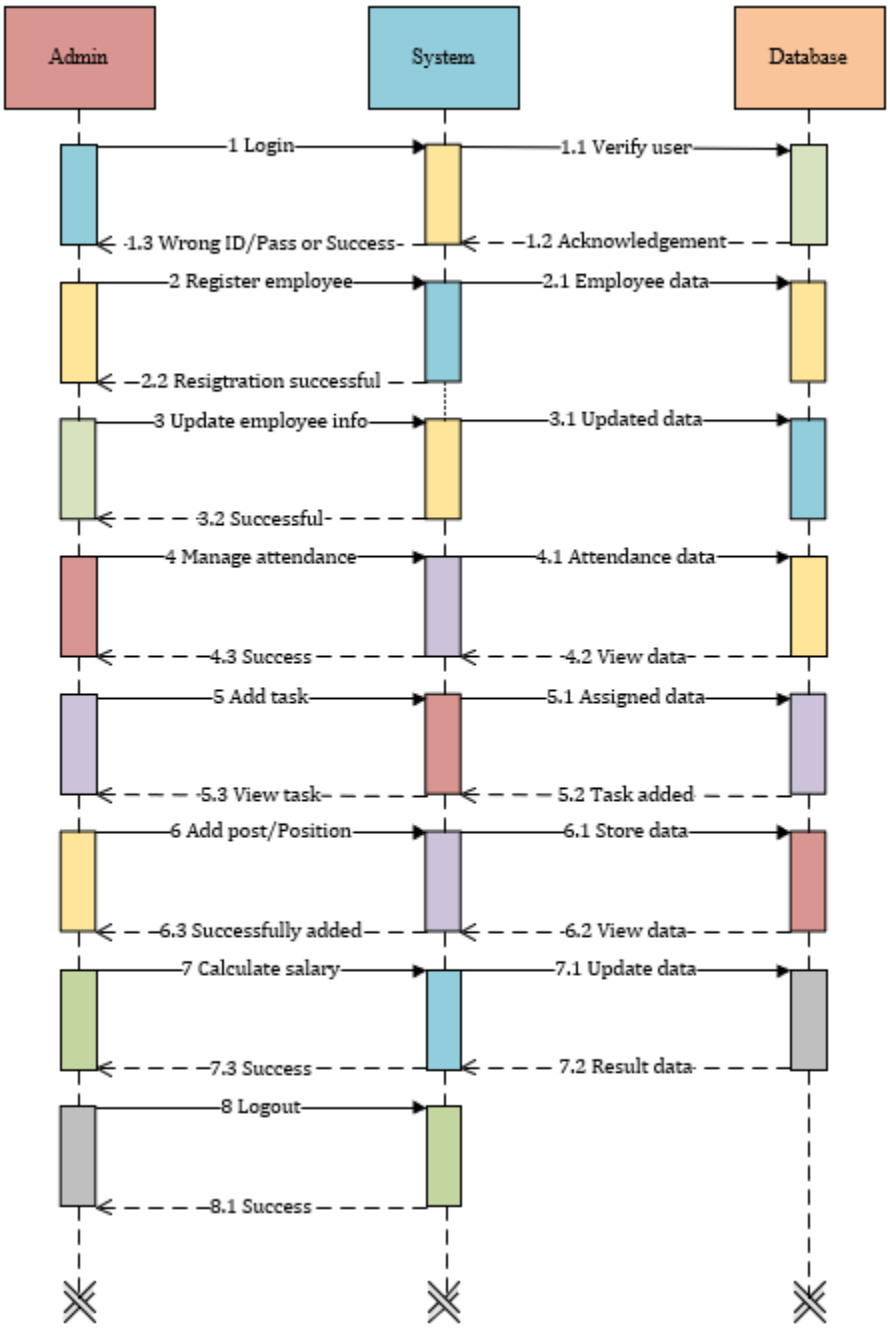

Figure 4.9: Activity diagram of Admin for Employee Management System

4.3.7. Data Flow Diagram

DFD or Data flow diagram shows the planning maps for the flow of information for any application or system. It is a proper diagram for a system which is made of some rectangles, circles, arrows, short text labels, data input-output, storage points etc

4.3.7.1 Data flow diagram for Admin:

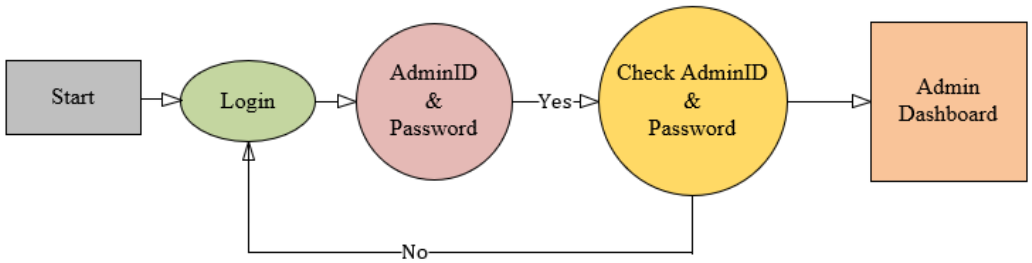

Figure 4.10: DF diagram of Admin for Employee Management System

4.3.7.2 Data flow diagram for Employee:

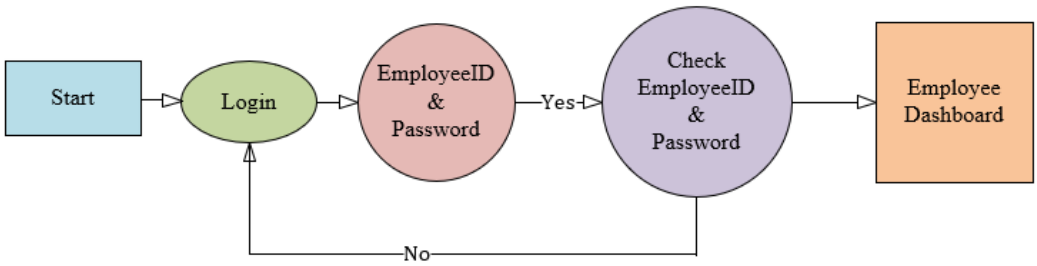

Figure 4.11: DF diagram of employee for Employee Management System

5. Expected Output

The Web-Based Employee Management System (EMS) is expected to produce the following pages as part of the system's functionality:

5.1. Home Page

This will be the main landing page where users can navigate when they enter website.

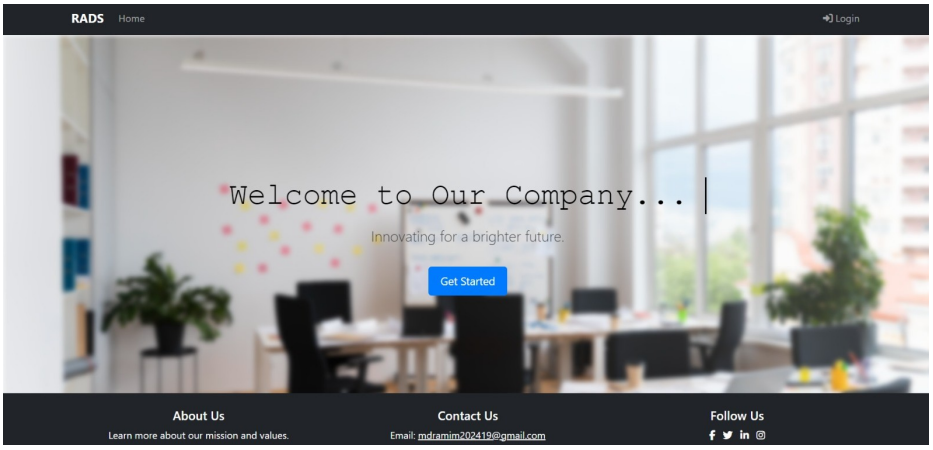

Figure 5.1: Home page of Employee Management System Project

5.2. Login Page

Both admins and users will use this page to securely log in to the system.

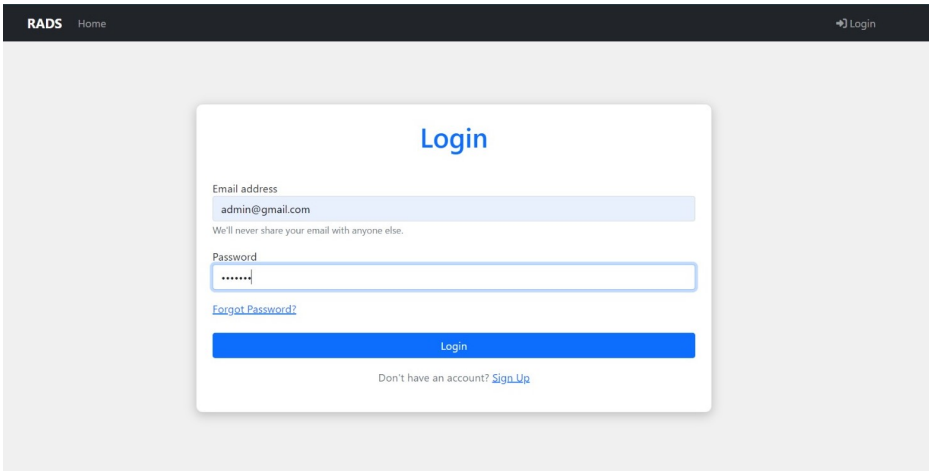

Figure 5.2: Login Page

5.3. Employee List Dashboard

Admins can see a list of all employees, along with options to view, update, or delete employee details.

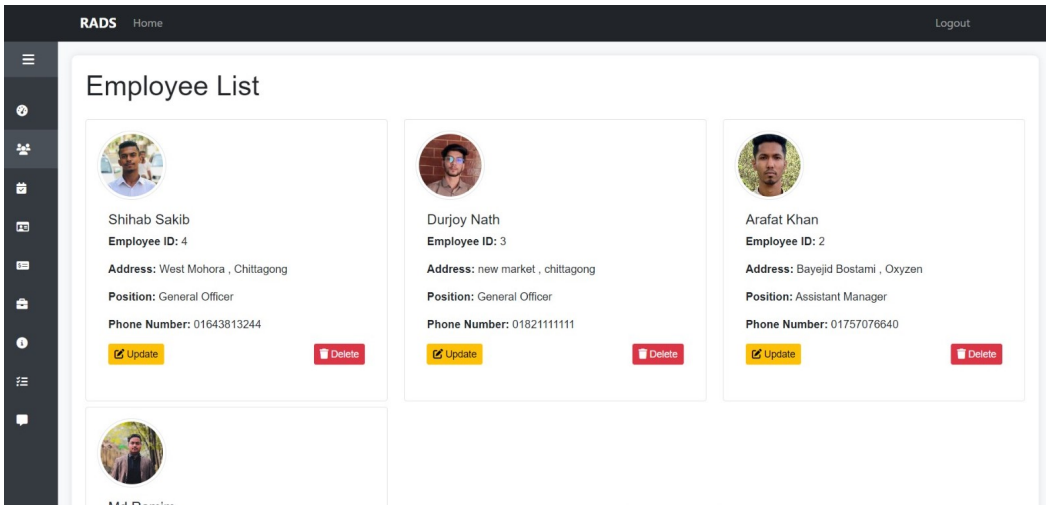

Figure 5.3: Employee List Page

5.4. Add or Registration Employee

This page will allow admins to register new employees by entering their information.

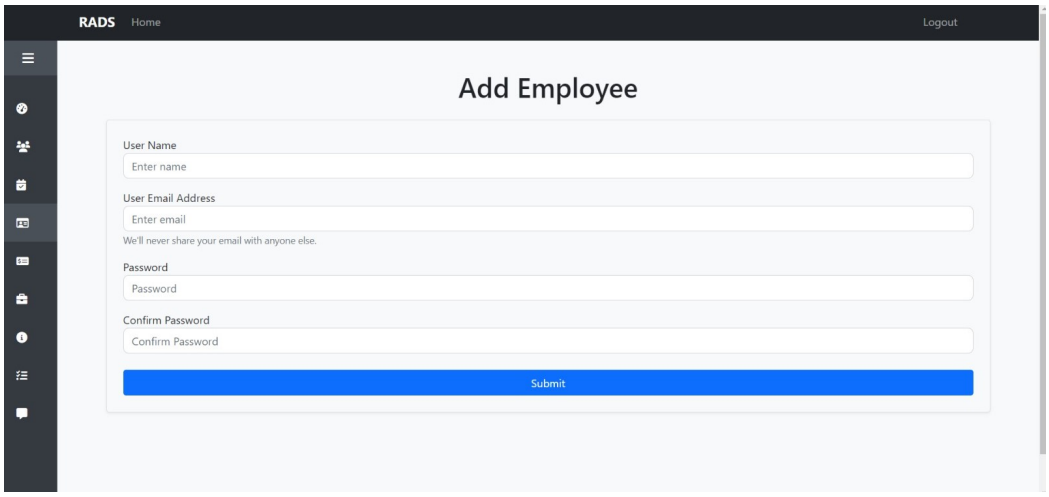

Figure 5.4: Employee Add Page

5.5. Employee Dashboard Page

The Employee Dashboard is a simple and easy-to-use platform for employees to access important information.

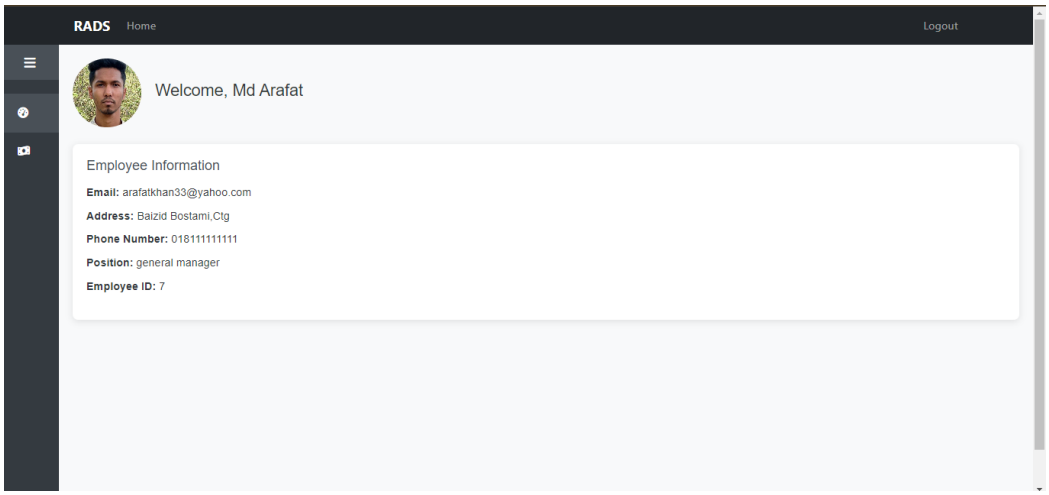

Figure 5.5: Employee Dashboard Page

5.6. Update Employees Information

Admins can use this page to update existing employee details when necessary.

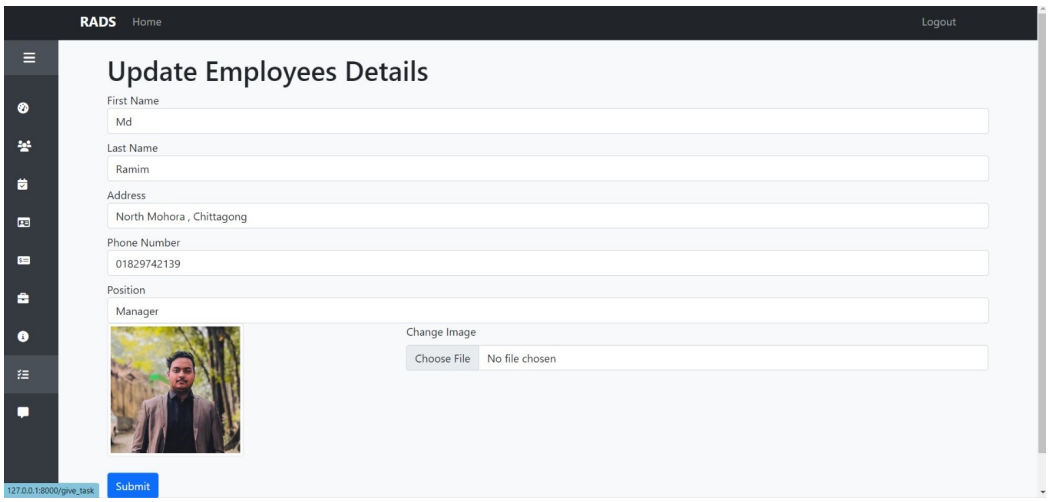

Figure 5.6: Update Employee Page

5.7. Create Task for Employee

Admins can assign new tasks to employees on this page.

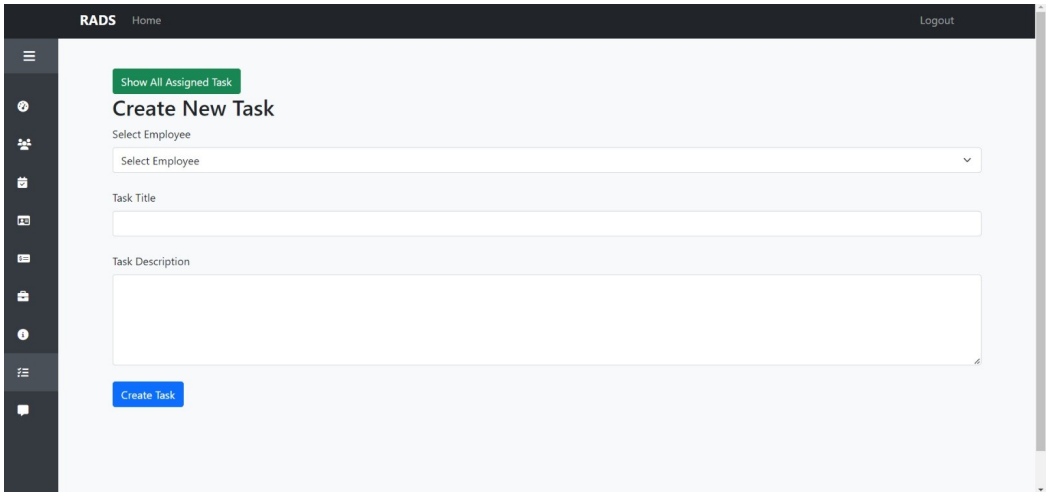

Figure 5.7: Task Page to Create Task

5.8. Submitted Task from Employee

Users can view tasks assigned to them and track their status, while admins can monitor the completion of tasks.

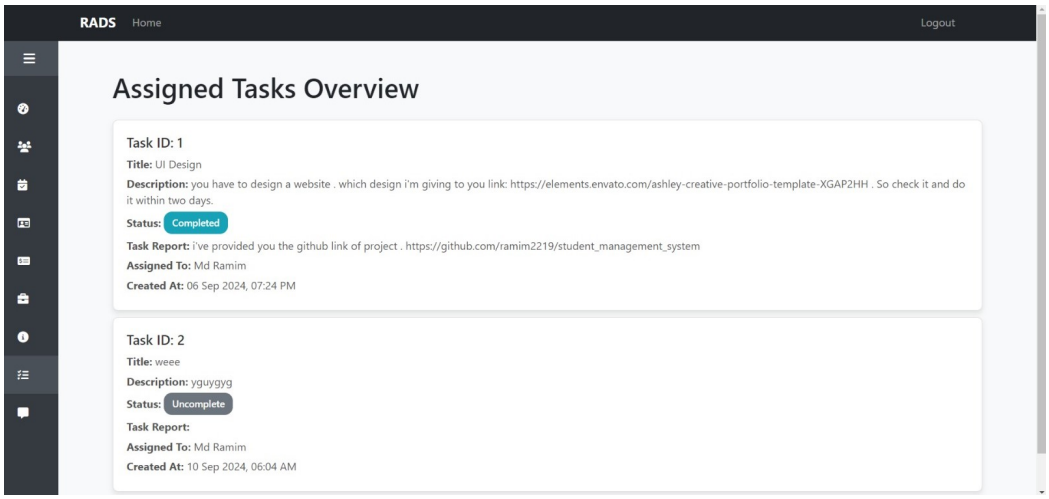

Figure 5.8: Assigned Task Page

5.9. Create Post for Employee

Admins can create and post notices or announcements for employees.

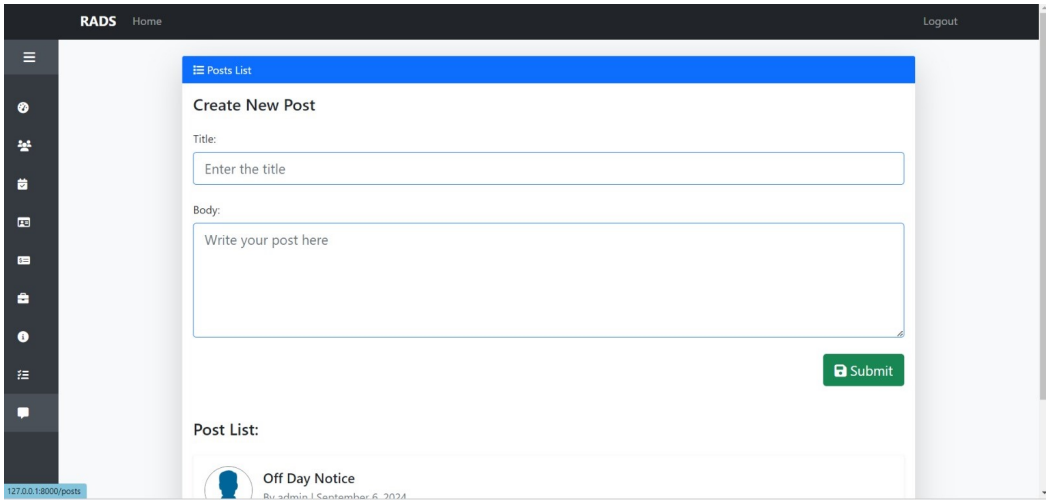

Figure 5.9: Post Page

5.10. Recent Post

In below Users can view the notices or posts shared by the admin.

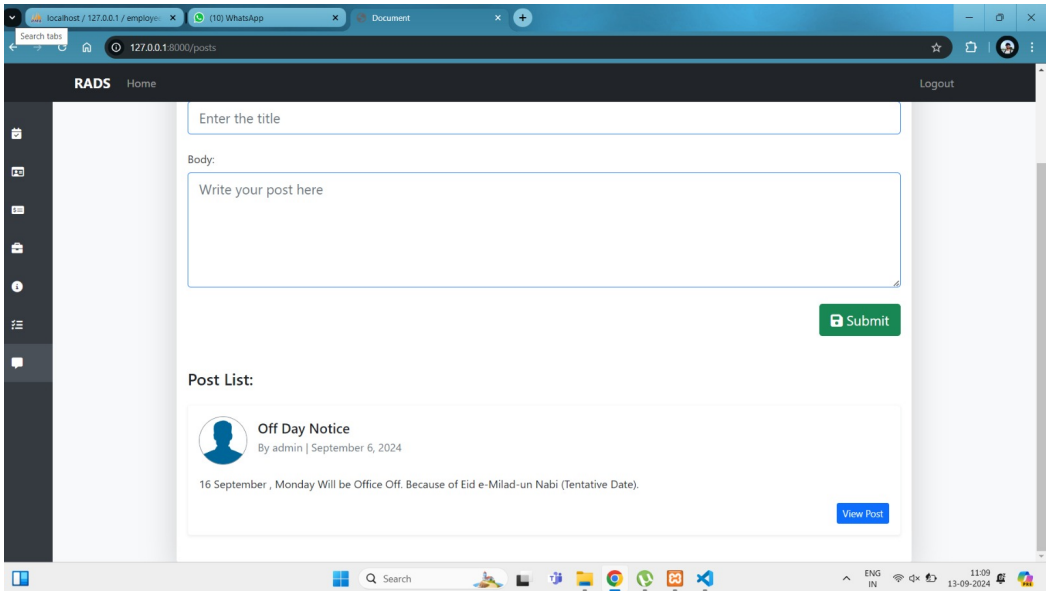

Figure 5.10: Notice Page

5.11. Total Hour Worked in a Month

This page will display the total hours an employee has worked in a given month.

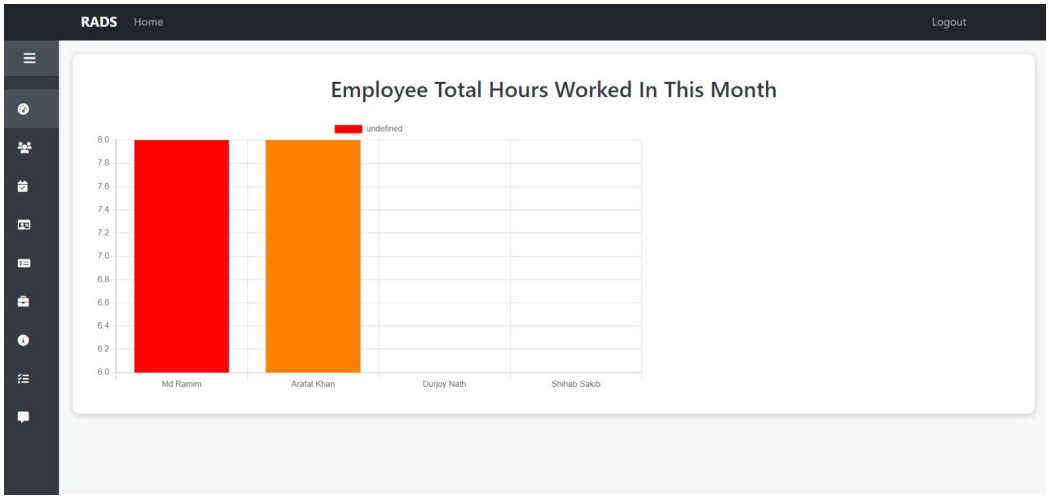

Figure 5.11: Total Hour Worked Page

5.12. Employee Attendance Page

This page will allow employees to mark their attendance

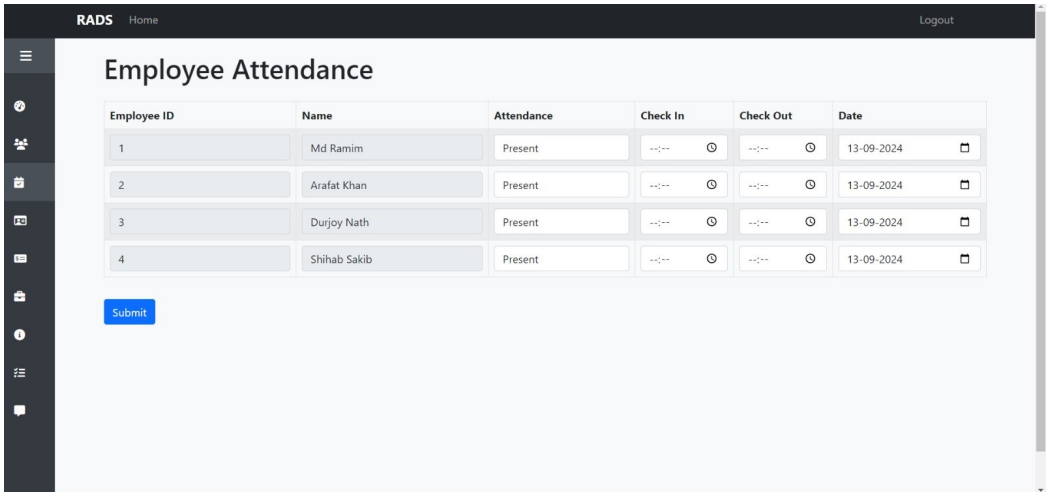

Figure 5.12: Attendance Page

5.13. Calculate Employees Salary Page

This page will help employers calculate and view employees' monthly salaries.

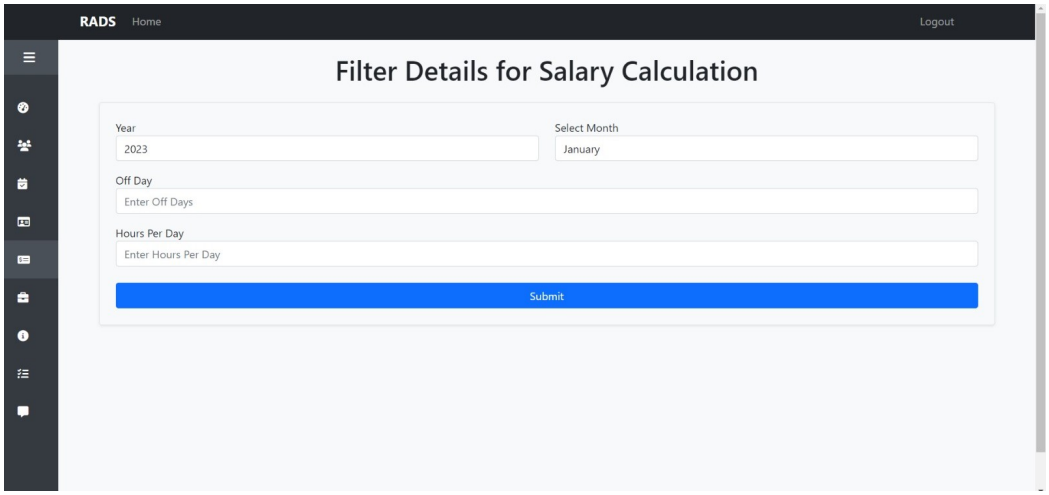

Figure 5.13: Calculate Employee Salary Page

5.14. Position Page

Admins can view and manage the list of positions available within the organization.

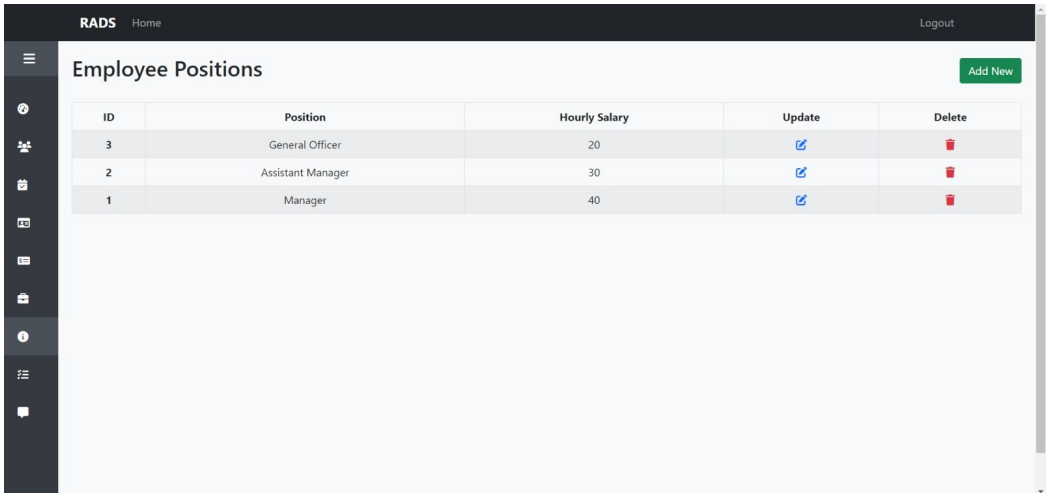

Figure 5.14: Position Page of Employees

6. Future Work

Future advancements in the Employee Management System project could focus on several key areas to improve accuracy and usefulness:

1. **Advanced Reporting and Analytics**: This will help employers make data-driven decisions to improve productivity and employee engagement.
2. **Mobile Application Development**: A dedicated mobile application for both Android and iOS could be developed, providing users with a more seamless and efficient experience than a web-based interface on smartphones. The mobile app could include features like push notifications for tasks, reminders for attendance, and real-time updates on employee records.
3. **Biometric Attendance**: Incorporating biometric attendance would enhance security and accuracy, making it particularly useful in organizations where strict attendance monitoring is critical.
4. **Employee Self-Service Portal**: An advanced self-service portal could be developed, allowing employees to not only view tasks, salaries, and personal details but also update their own information, download payslips, apply for leaves, and view attendance history.

7. Conclusion

7.1. Limitation

Every system has its limitations, and the proposed Employee Management System (EMS) is no exception. The following are some key limitations of the system:

- **Internet Dependence:** The system requires a stable internet connection. This can be problematic in areas with unreliable or poor connectivity.
- **Smartphone Requirement:** Employees need a smartphone to access key features of the system. This might not be feasible for everyone and could pose a barrier for some users, especially if the system is primarily web-based.
- **Limited Customization:** The system may not fully meet the unique HR policies and practices of every organization, as customization is limited.
- **HR Policy Variation:** Each organization has its own HR policies and practices, so the system may not cover all specific requirements of every business.

These limitations should be considered when planning for the implementation and future enhancements of the EMS.

7.2. Conclusion

The web-based Employee Management System (EMS) is built to simplify and improve employee management. It replaces outdated manual processes that can cause errors and inefficiencies. The EMS features employee management, salary processing, attendance tracking, and organized data, all of which enhance productivity and ensure accurate and secure operations.

The system is scalable, so it can expand as the business grows. Future updates may include advanced analytics, a mobile app, and bio-metric attendance, which will make the system even more valuable for employers and employees.

References

[1] K. D. Kanchev, “Employee management system,” 2006, pp. 1–65. [Online]. Available: https://lnu.diva-portal.org/smash/get/diva2:204828/FULLTEXT01.pdf

[2] E. Ansari, “Web based employee management system,” *BUET*, 2019. [Online]. Available: http://lib.buet.ac.bd:8080/xmlui/handle/123456789/5830

[3] P. Gloria, “Employee management system,” 2012. [Online]. Available: https://images.template.net/wp-content/uploads/2016/07/15084700/employee-project-tracking-template-.pdf

[4] S. Thapa, “Employee management system,” 2023. [Online]. Available: https://srmus.ac.in/view/governance/naac/1.3.4/Supporting%20Documents/MCA/Suchana%20Thapa%2020IT103009.pdf

[5] H. k. Yash pratap singh, Yogyata nagayach, “Employee management system,” 2023. [Online]. Available: https://ymerdigital.com/uploads/YMER2205U2.pdf