



## **Year 3 Programming Project**

### **Online Employee Management System at Infinity Networks**



**Submitted by**  
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Project submitted to the Department of Software Engineering of the Université des Mascareignes in partial fulfilment of the requirements for the award of Degree of Bachelor Science with (Hons) in Software Engineering

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**11<sup>th</sup> MARCH 2024**

**PROJECT DECLARATION FORM**

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**DECLARATION**

I declare that every part of this project work is my own unaided work and does not contain unreference material from any other source.

I understand that violation of these conditions may result in a mark of zero being awarded for the component or components of the project affected.

**Signature:****Date: 11<sup>th</sup> March 2024**

## **1 ABSTRACT**

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The Online Employee Management System (OEMS) is a flexible and effective software program designed to improve an organization's HRM procedures. OEMS integrates multiple modules, such as user management, newsfeed management, leave management, task management, company directory, payslip management, and more, and is based on a monolithic architecture. OEMS, which was mostly developed in PHP and is hosted on the XAMPP platform, guarantees smooth functioning in a variety of browsers, including Firefox Developer Edition. In order to promote readability and maintenance, the system complies with coding best practices, with an emphasis on clear code structure, uniform indentation, and insightful comments.

Strong security features, such as role-based access control, are incorporated by OEMS to guarantee data integrity and safeguard private data. It offers user-friendly interfaces that are customized for administrators, managers, and staff members according to their individual roles and duties. Advanced analytics and machine learning features will be integrated into OEMS in the future to provide insights into HR metrics and trends. Furthermore, initiatives are in motion to create native mobile applications that will enhance accessibility and user experience.

The development of OEMS has been driven by the need for organizations to optimize their HR operations and adapt to evolving technological trends. By automating processes such as leave management and payslip generation, OEMS enables HR departments to allocate resources more efficiently and focus on strategic initiatives. Furthermore, ongoing efforts to enhance security features and ensure interoperability with other enterprise systems will further solidify OEMS as a comprehensive HR management solution.

In conclusion, OEMS is a huge development in HR technology that gives businesses a strong tool to increase productivity, enhance efficiency, and encourage employee involvement. OEMS has the potential to become into a vital resource for businesses looking to prosper in the digital era with more innovation and growth.

## **2 ACKNOWLEDGEMENT**

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First and foremost, I wish to thank my wife, Nandani, who has stood by me through all my travails, my absences, my fits of pique and impatience. She gave me support and help, discussed ideas and prevented several wrong turns. She also supported the family during much of my studies and the pandemic. Along with her, I want to acknowledge my daughter, Shaivi. She has never known her dad as anything but a student, it seems. In fact, all my family have been steadfast and supportive.

In preparation of my project, I had to take the help and guidance of some respected persons, who deserve my deepest gratitude. As the completion of this project gave me much pleasure, I would like to show my gratitude to Mrs. Mahejabeen Peermamode-Mohaboob, my project Supervisor, of Université des Mascareignes for giving me a good guideline throughout numerous consultations. I would also like to expand my gratitude to all those who have directly and indirectly guided me in writing this project.

Besides, I also extend gratitude and appreciation to lecturers in Software Engineering department of Université des Mascareignes who have taught me at one point or the other. May God continue to bless, protect, and guide you all.

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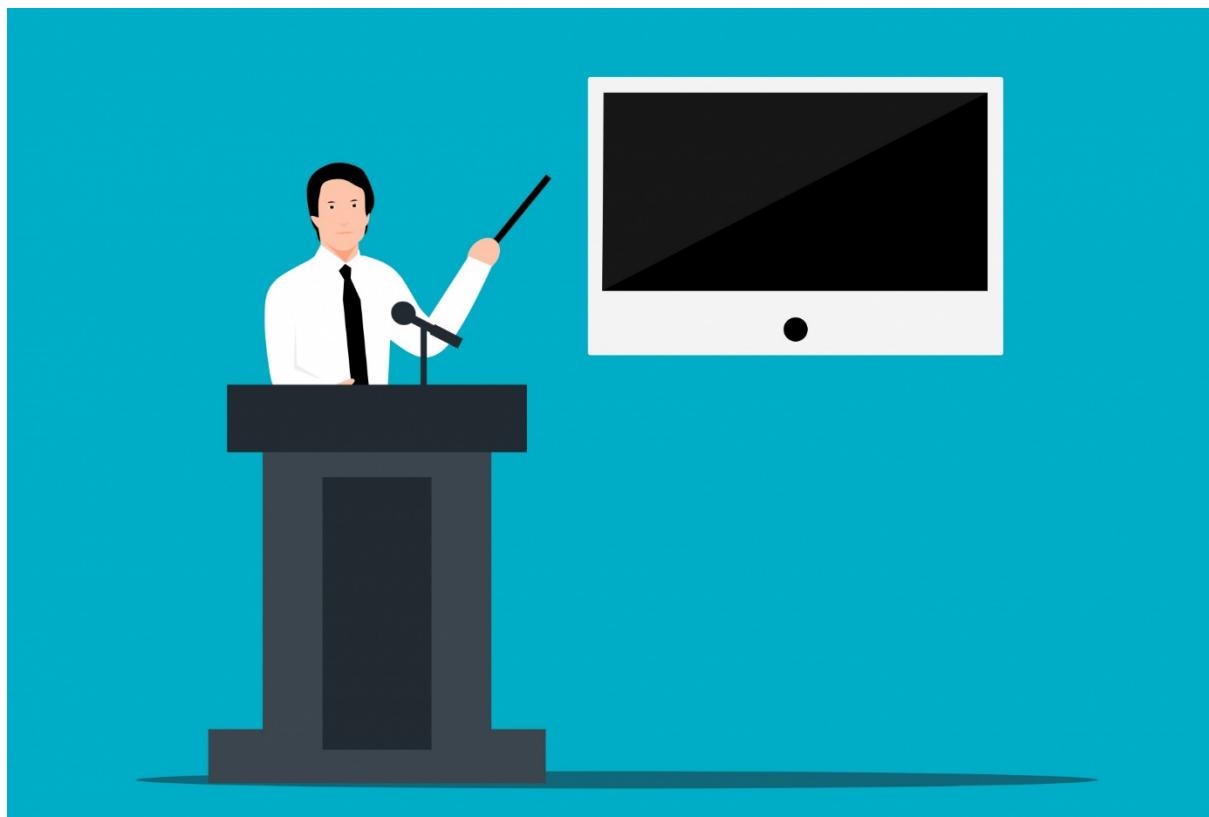
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## INTRODUCTION



**INFINITY  
NETWORKS**

## **6 PROBLEM DEFINITION**

Infinity Networks is a well-known telecommunication company based in Grand Baie, Mauritius, that is dedicated to providing innovative communication solutions to businesses and individuals in Mauritius and beyond. With a skilled workforce of approximately 300 employees, the company has established itself as a leading player in the telecommunications industry by offering a range of services that cater to the diverse needs of its customers. These services include high-speed internet, fiber optic connectivity, cloud computing, managed IT services, and mobile phone service, among others.

As a company that values its employees and strives to provide them with the best possible working environment, Infinity Networks is now considering investing in an online employee management system. This system will include features such as payslip generation, leave inquiry, performance management, and daily work management, among others. By implementing such a system, Infinity Networks aims to streamline its HR processes, improve communication with employees, and ensure greater accuracy in payroll and other HR-related tasks.

The new employee management system will also allow employees to access their information online, making it easier for them to manage their leave, view their payslips, and track their performance over time. This will not only save time and effort but also improve the overall employee experience by providing a more convenient and efficient way of managing HR-related tasks.

In addition to its commitment to providing innovative communication solutions, Infinity Networks also places a strong emphasis on employee development and well-being. By investing in an online employee management system, the company is taking another step towards enhancing its HR practices and ensuring that its employees feel valued, respected, and supported in their work. Overall, this investment reflects Infinity Networks' dedication to excellence and its ongoing efforts to stay at the forefront of the telecommunications industry.

### **6.1 COMPANY SUMMARY**

*Table 1: Company Profile*

<b>Company Name</b>	Infinity Networks
<b>Location</b>	Grand Baie, Mauritius
<b>Year Established</b>	2023
<b>Legal Entity Type</b>	Private Limited Company (Ltd.)
<b>Industry</b>	Telecommunications
<b>Products/Services</b>	Telecommunications services and solutions
<b>Number of Employees</b>	Approximately 500
<b>Annual Turnover</b>	10 million Mauritian Rupees (MUR)
<b>Ownership Structure</b>	Ramlochund's Group of Companies
<b>Key Executives</b>	Ramlochund Gitendrajeet – CEO   Ramlochund Nandani Kumari - CFO
<b>Company Website</b>	<a href="http://www.infinity-networks.mu">www.infinity-networks.mu</a>
<b>Social Media Presence</b>	<a href="https://www.facebook.com/infinitynetworks/">https://www.facebook.com/infinitynetworks/</a>
<b>Major Competitors</b>	Orange, Emtel, Mauritius Telecom, MTML
<b>Business Challenges</b>	Increasing competition, changing technology
<b>Growth Opportunities</b>	Expansion into new markets, introduction of new products/services

### 6.1.1 Company Logo



Figure 1: Infinity Networks Logo

## 6.2 OBJECTIVES OF THE PROJECT

Infinity Networks objective to invest in and automate its employee management system is aimed at improving the efficiency of its HR processes, enhancing employee engagement, and ensuring compliance with regulatory requirements. The project is intended to leverage technology to make the management of employee-related data and processes more streamlined and accessible to all employees through an online employee management system that includes payslip generation, leave inquiry, performance management, and daily work management. **The proposed solution for Infinity Networks is a web based online platform.**

The key objectives of the project are as follows:

The system will have two main user types: employees and administrators. Employees will be able to view their personal information, such as their contact details and employment status. They will also be able to request leaves and view their payslips. Administrators, on the other hand, will have access to all employee information and will be responsible for managing daily work, performance evaluations, and other related tasks.

Here are some of the key features of the system:

- **Personal Information Management:** The system will allow employees to view and update their personal information, such as their contact details and emergency contact information.
- **Leave Management:** The system will enable employees to submit leave requests online, and administrators can approve or reject those requests based on the company's leave policy.
- **Payslip Generation:** The system will generate payslips for employees on a regular basis, which they can access and download from their accounts.
- **Performance Management:** The system will provide a platform for administrators to evaluate employee performance, set goals and objectives, and provide feedback.
- **Daily Work Management:** The system will allow administrators to assign tasks to employees, track the progress of those tasks, and provide updates and feedback as needed.

- **Reporting:** The system will generate reports on employee attendance, leave balance, performance, and other relevant metrics.
- **NewsFeed:** The system will be able to display company's latest internal news and videos.
- **Security and Privacy:** The system will have strong security measures to protect employee information and ensure that only authorized users have access to the system.

Overall, the system will provide a comprehensive solution for managing employee information, leave requests, payslips, performance evaluations, and daily work tasks. With these features, employees and administrators will have the tools they need to streamline their work and improve efficiency.

### **6.3 SCOPE OF THE PROJECT**

Scope of the project can be defined as developing an online employee management system that provides features such as employee data management, leaves management, performance management, daily work management, and payslip generation. The system will have three types of users: administrators, supervisors and employees. Administrators will have the authority to manage employee data, view tasks, manage leaves, create newsfeed, create employee, create users, create pms objectives, create leaves balances and generate payslips. Employees will be able to view their personal details, check leave balance, manage daily tasks, view their payslip, make their daily check in and check out attendance and view their performance evaluation.

The system will also have features such as authentication, access control, and data backup to ensure the security and reliability of the system. The project scope will include designing and developing a database schema, implementing the system using suitable software development tools and technologies, and conducting testing and debugging to ensure the system functions as expected. The system will be designed to be scalable and flexible, allowing for future enhancements and upgrades. The scope will also involve training for users to ensure they are familiar with the system and its functionalities.

### **6.4 GUIDE TO FEASIBILITY STUDY**

A feasibility study can be conducted to determine the viability of the proposed employee management system. The feasibility study will consider three aspects: technical feasibility, economic feasibility, and operational feasibility.

1. **Technical Feasibility:** The technical feasibility of the system can be evaluated based on the available technology, expertise, and resources. The proposed system is technically feasible as it is designed using modern technologies such as a web-based application, a relational database management system, and programming languages such as PHP and SQL. The expertise required to develop the system is available, and the resources required to implement and maintain the system are within reach.
2. **Economic Feasibility:** The economic feasibility of the system can be evaluated based on the cost of development, implementation, and maintenance, and the benefits of the system. The cost of development and implementation can be estimated based on the

requirements and technology required for the system. The benefits of the system include improved efficiency, better employee management, reduced errors, and increased accuracy in payslip generation. The benefits are expected to outweigh the costs, making the system economically feasible.

3. Operational Feasibility: The operational feasibility of the system can be evaluated based on the ability of the users to adapt to the system, and the impact of the system on the existing processes. The system is expected to be operationally feasible as it has been designed to be user-friendly, with an intuitive interface that is easy to navigate. The system will be integrated with the existing processes and procedures to ensure minimal disruption.

#### **6.4.1 What should be done?**

To begin, we must first understand the project's goals and objectives, as well as the time it will take to finish the project; to accomplish these goals, excellent planning is critical. The following adjustments must be made for Infinity Networks Online Management System be successful.

1. It is necessary to comprehend the system's requirements.
2. Find solutions to any issues pertaining that may have arisen or will occur.
3. Indicate when the solution will be put into action.

#### **6.4.2 When is it going to be finished?**

It is necessary to gather as much information, issues, and answers as possible before beginning the application design and development. This will help to ensure that a decent website is created.

#### **6.4.3 Who will be the one to accomplish it?**

The website's development team. They will enable us to assess project progress to date and generate accurate estimates regarding remaining project work at the same time.

#### **6.4.4 Target Audience**

As per problem definition defined with this project there are 3 different actors namely:

- Employees
- Human Resources Administrator
- Employee's Supervisor

Case Audience as follows for the system:

- Human Resource Administrator (High-Level privilege)
- Supervisor (Mid-level privilege)
- Employee (User Level Privilege)

The main target audience for the system will be Employees. These above users will be allowed to log onto the system, and which will be role based. All users will be sorted upon role and as per Infinity Networks security guidelines for the proper running and functioning of the system.

## 6.5 THE PROJECT'S SCHEDULE

A Gantt chart is the best way to visualize a project schedule. After all questions have been answered, the planning dates, activities, duration, milestones, and resources can now be started.

*Figure 1* is the proposed time frame for which the project has been divided in 4 quartiles where time has been allocated to complete each phrase in time for a best project management scenario possible.

There are at total 6 Phases:

1. Project Study and Investigation
2. Analysis of Project Requirements
3. Interim Design Phase 1
4. Final Design Phase 2 and Documentation
5. Coding of Software Prototype
6. Testing Phase of Software and Software Documentation

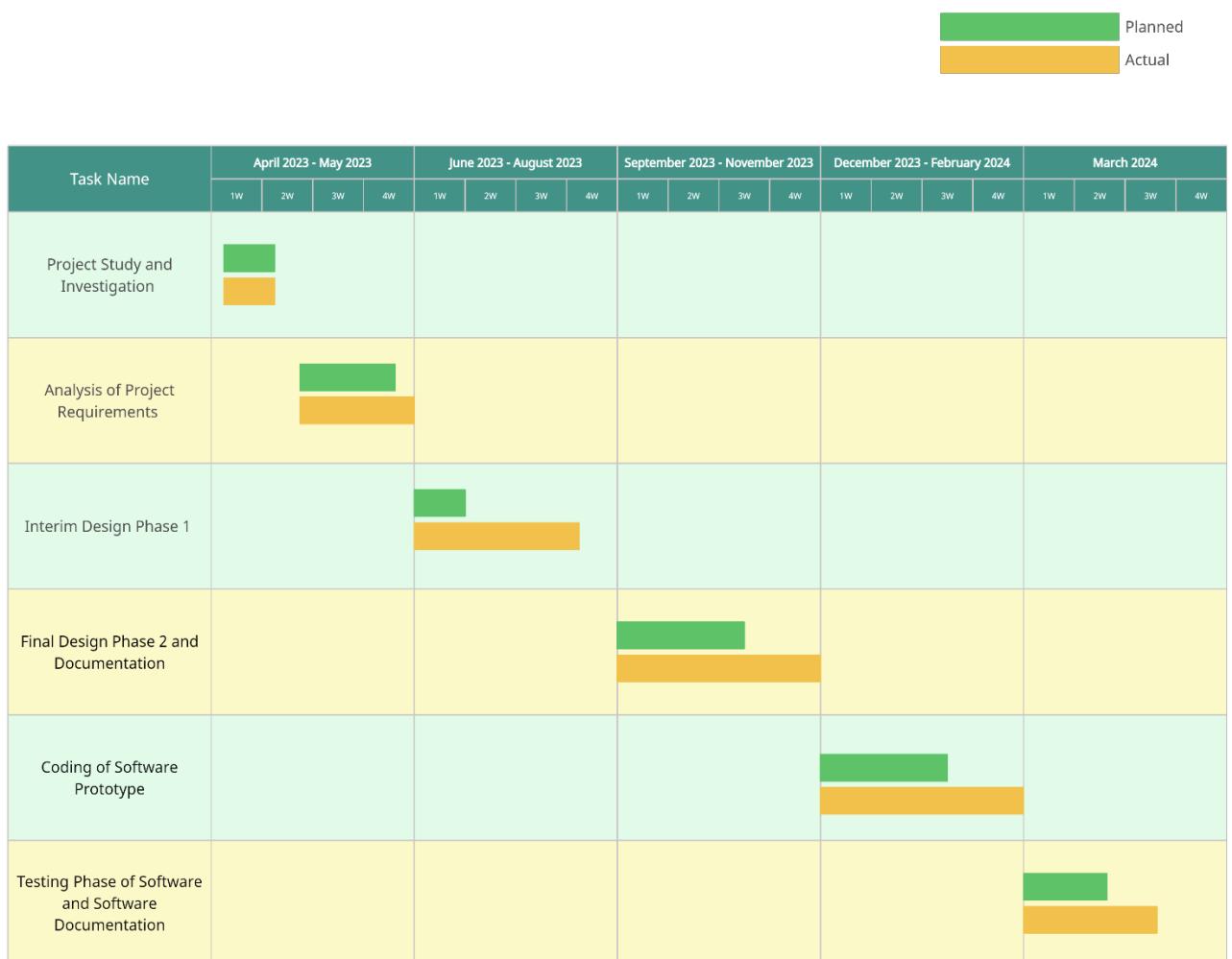


Figure 2: Gantt Chart for the Programming project



## ANALYSIS



INFINITY  
NETWORKS

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## 7 LITERATURE REVIEW

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### 7.1 PAST CASE STUDIES

#### 7.1.1 Employee Management System Case Study

*"Employee Management System is a distributed application, developed to maintain the details of employees working in any organization. It maintains the information about the personal details of their employees, also the details about the payroll system which enable to generate the payslip. The application is actually a suite of applications developed using Java. It is simple to understand and can be used by anyone who is not even familiar with simple employees' system. It is user friendly and just asks the user to follow step by step operations by giving him few options. It is fast and can perform many operations of a company. This software package has been developed using the powerful coding tools of JAVA at Front End and Microsoft Sql Server at Back End. The software is very user friendly. The package contains different modules like Employee details. This version of the software has multi-user approach. For further enhancement or development of the package, user's feedback will be considered."*

**Link to Case Study:** <https://www.studocu.com/in/document/vellore-institute-of-technology/software-engineering/64774313-employee-management-system-report/26449093>

#### 7.1.2 Employee Management System: A Major Project Report

*"Employees Management Software makes it easy for the employer to keep track of all records. This software allows the administrator to edit employees, add new employees, transfer/promote/terminate employees. Each employee in the database is associated with a position can be added and edited when need arises. Employees can be transferred between positions easily without having to retype back their information in the database. You can check to see if there are duplicate positions/employees in the database. Most of all, the employer can assign tasks to employees and assess their progress in order to keep track of employee performance. This system brings about an easy way of maintaining the details of employees working in any organization. It is simple to understand and can be used by anyone who is not even familiar with simple employees' system. It is user friendly and just asks the user to follow step by step operations by giving easy to follow options. It is fast and can perform many operations for a company. The goal of this project is to design and develop an employee management system to fill existing gaps in the electronic management of employees. This software allows the administrator to edit employees, add new employees, transfer/promote/terminate employees. Each employee in the database is associated with a position can be added and edited when need arises. Employees can be transferred between positions easily without having to retype back their information in the database."*

**Link to Case Study:** <https://pdfcoffee.com/employee-management-system-a-major-project-report-on-pdf-free.html>

## 7.2 QUICK REVIEW

The Online Employee Management System is a comprehensive solution designed to streamline and automate various employee-related processes within an organization. It offers a wide range of functionalities including personal information management, leave management, payslip generation, performance management, daily work management, reporting, and a news feed for employees.

Figure 2, Context diagram shows the basic data flow of information in the system.

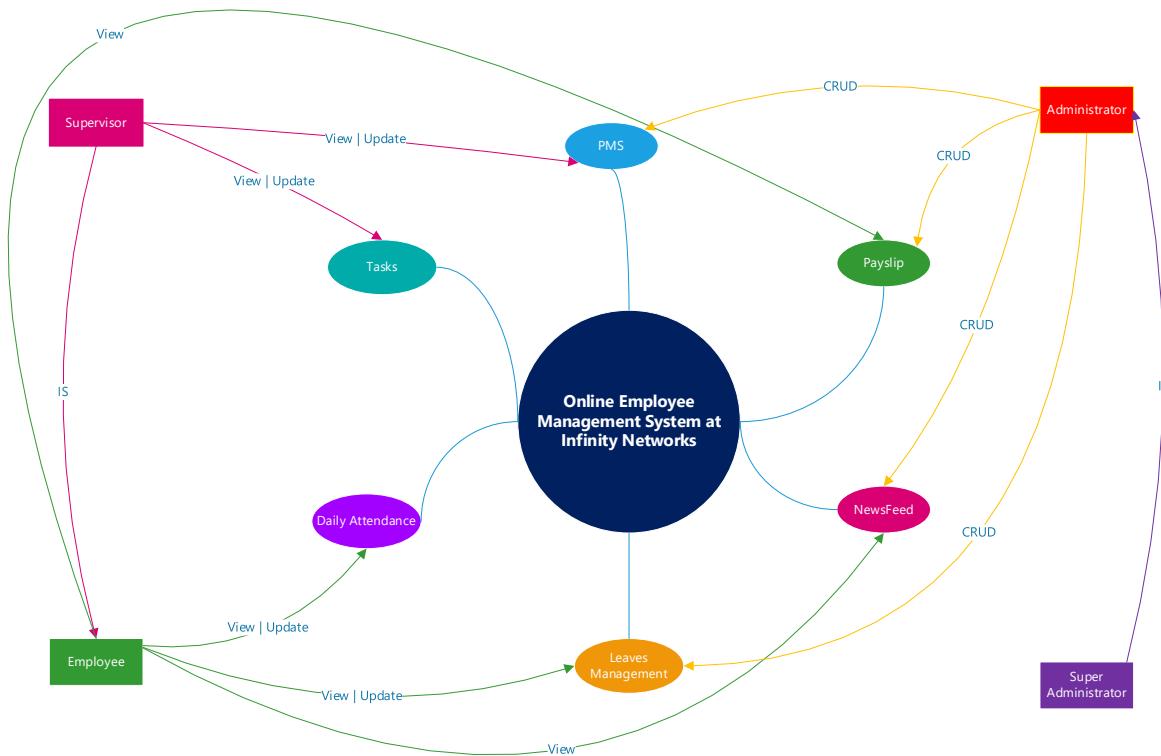


Figure 3: Context Diagram of OEMS

## 7.3 STRENGTH OF THE SYSTEM

The Online Employee Management System allows employees, supervisors, and administrators to conveniently access and utilize the system without the need for physical interaction. They can securely access the system through internet-enabled devices such as smartphones, tablets, or personal computers. This eliminates the reliance on paper-based processes and significantly reduces time-consuming tasks. By adopting this system, organizations can embrace a more environmentally-friendly approach, supporting their go green campaign.

## 7.4 SYSTEM WEAKNESS AND LIMITATIONS

The primary limitation of the system lies in its dependence on internet connectivity. In the absence of a stable internet connection, the system's functionality will be hindered, rendering it unable to operate effectively. This can be problematic, particularly during periods of high demand or urgency, as data processing and real-time updates may be disrupted. Consequently, manual intervention from the human resource department may be necessary to address urgent situations or handle data processing tasks manually.

## 7.5 PROJECT METHODOLOGY

Agile methodology is the best fit for the Online Employee Management System due to its flexibility, incremental development, customer collaboration, and quick response to change. Agile allows the system to adapt to evolving requirements, deliver functionality in smaller increments, involve users throughout the development process, and respond quickly to changes.

## 7.6 WHY CHOOSING AGILE MODEL?

Agile methodology is chosen for the Online Employee Management System due to its flexibility, iterative development, customer collaboration, adaptability to change, and focus on continuous improvement. It allows for easy handling of changing requirements, delivers the system in smaller increments, involves users throughout the process, responds quickly to changes, and promotes ongoing enhancements. This ensures that the system meets evolving needs, aligns with user preferences, and continually improves over time.



Figure 4: The Agile Methodology

## 7.7 SOFTWARE METHODOLOGY

The project of Infinity Networks Online Employee Management System is an Object-Oriented Based project. The software methodology used to develop this project is based on object-oriented methodology. In this environment software is a collection of discrete objects that encapsulate their data as well as the functionality to model real world “object”. Each object has attribute and methods, grouped into classes and is responsible for itself.

## **8 CASE ANALYSIS**

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### **8.1 QUICK REVIEW**

Any ambiguities must be clarified solely at this stage in the development process by the developer's own experts who are responsible for delivering the solution.

### **8.2 THE QUESTIONNAIRE**

A questionnaire was designed with purpose to gather feedback from employees regarding their satisfaction with the current employee management processes and their preferences for a new online employee management system. The questionnaire covers aspects such as accessibility, challenges faced, desired features, comfort with technology, openness to using a new system, and concerns about security and privacy.

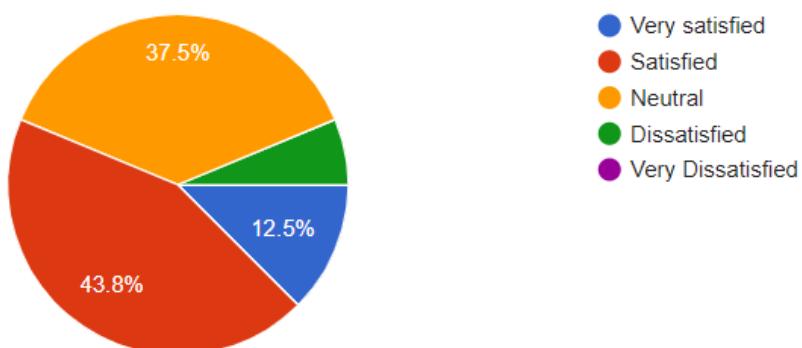
The questionnaire aims to gather insights on the following points:

1. Employee satisfaction with current employee management processes.
2. Current methods of accessing work schedules, time off requests, and related information.
3. Challenges or difficulties faced with the current employee management processes.
4. Expectations of how a new system could improve work.
5. Desired features in a new employee management system.
6. Employee comfort with using technology and computers for work.
7. Willingness to adopt a new employee management system.
8. Importance of easily accessing work schedules, time off requests, pay, and benefits in one place.
9. Concerns or considerations regarding the security and privacy of personal information in an online system.
10. Any additional suggestions or feedback about the new system.

Link to Questionnaire: <https://forms.gle/ChXUofqr9X92kCX26>

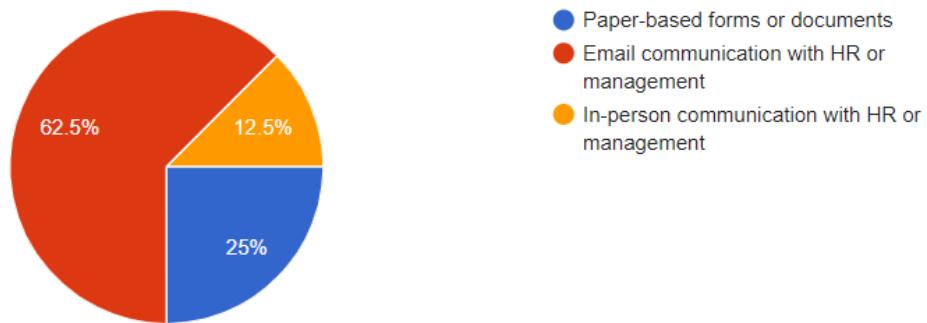
1. How satisfied are you with the current employee management processes at Infinity Networks?

16 responses



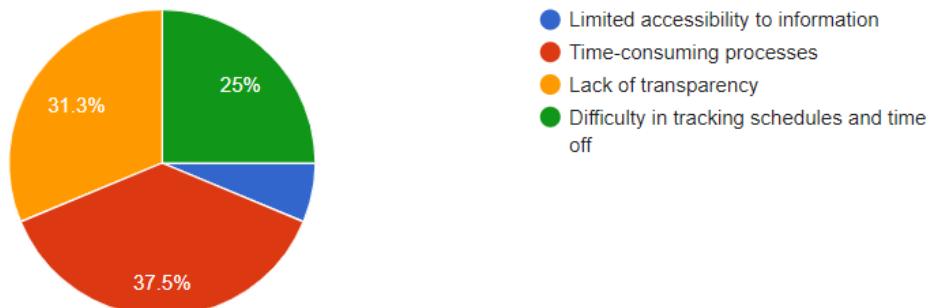
2. How do you currently access your work schedule, time off requests, and related information?

16 responses



3. What challenges or difficulties do you face with the current employee management processes?

16 responses



4. How do you think a new system could make your work better?

16 responses



## 5. What features do you want in a new employee management system?

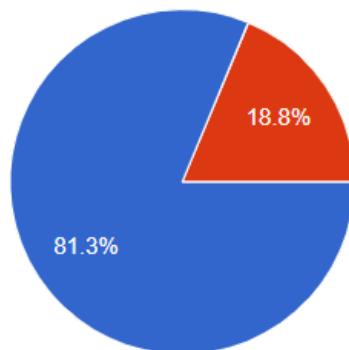
16 responses



## 6. Are you comfortable using technology and computers for work?

16 responses

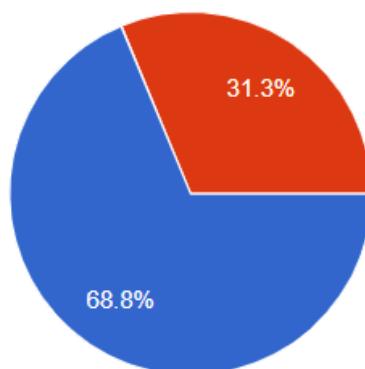
- 
- Yes, I'm comfortable
  - No ,It's difficult



## 7. Are you open to using a new employee management system?

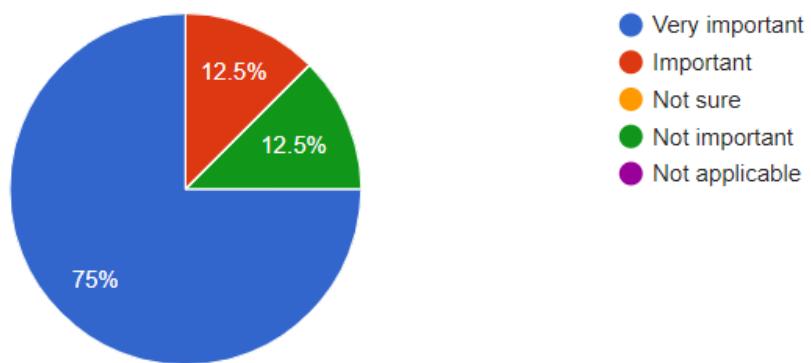
16 responses

- 
- Yes, I'm open to it.
  - No ,I have concerns.



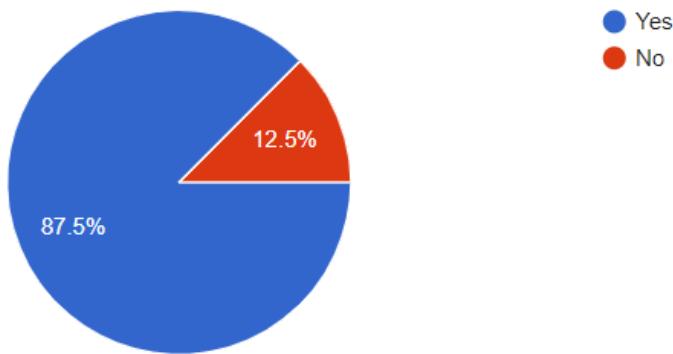
8. How important is it for you to easily see your work schedule, ask for time off, see your pay, and benefits in one place?

16 responses



9. Are there any concerns or considerations regarding the security and privacy of your personal information in an online employee management system?

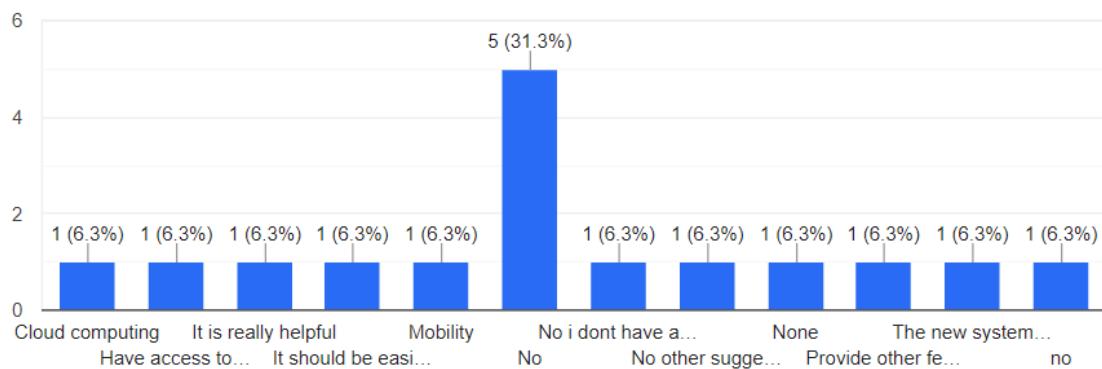
16 responses



10. Do you have any suggestions or other things you want to tell us about this new system?

[Copy](#)

16 responses



### **8.3 OUTCOME OF THE QUESTIONNAIRE**

Based on the questionnaire responses, the majority of employees are satisfied or somewhat satisfied with the current employee management processes at Infinity Networks. However, there are several challenges identified, including time-consuming processes, lack of transparency, and difficulty in tracking schedules and time off. Employees expressed a desire for a new system that provides easy access to schedules, reduces paperwork, improves communication, and offers features such as requesting time off and accessing pay and benefits.

Most employees are comfortable with technology and open to using a new employee management system. Security and privacy concerns were also raised, highlighting the importance of addressing these issues in the development of the new system. Overall, the questionnaire provides valuable insights for designing an effective and user-friendly online employee management system that addresses the specific needs and concerns of the employees at Infinity Networks.

### **8.4 THE FEASIBILITY STUDY**

When conducting a feasibility study for the Online Employee Management System, several key considerations should be taken into account:

#### **8.4.1 Technical Wise**

Some of the important technical feasibility considerations for the Online Employee Management System at Infinity Networks:

- **System Compatibility:** Ensure the system works seamlessly across various devices and platforms, such as smartphones, tablets, and computers, with support for multiple operating systems and web browsers.
- **Internet Connectivity:** Verify that stable and reliable internet connectivity is available within the organization to ensure uninterrupted access to the system.
- **Data Security:** Implement robust security measures to protect sensitive employee information, including encryption, secure authentication, role-based access control, and adherence to data protection best practices.
- **Scalability:** Design the system to accommodate future growth by ensuring it can handle an increasing number of employees and data without compromising performance.
- **Integration Capabilities:** Assess the system's ability to integrate with existing systems and applications within the organization, improving data exchange and overall efficiency.
- **User-Friendly Interface:** Develop an intuitive and user-friendly interface, catering to employees with varying technical skills to ensure ease of navigation and usage.
- **System Maintenance and Support:** Ensure the availability of technical resources and expertise for ongoing system maintenance, bug fixes, updates, and user support.

#### **8.4.2 Economic Wise**

The project will use open-source software for building up and mostly freeware for coding environment. The best way to illustrate the Cost estimate is to build an estimate of the project costing at the start of the project itself and query the party concern if its fits on their budget.

#### 8.4.2.1 The Cost Estimate

The Cost estimation is the financial effort spent on software development and testing. A cost estimation model is some mathematical algorithm or parametric equation used to estimate the cost of a product or project. Professionals create an overall plan or budget for a project without defining the particulars.

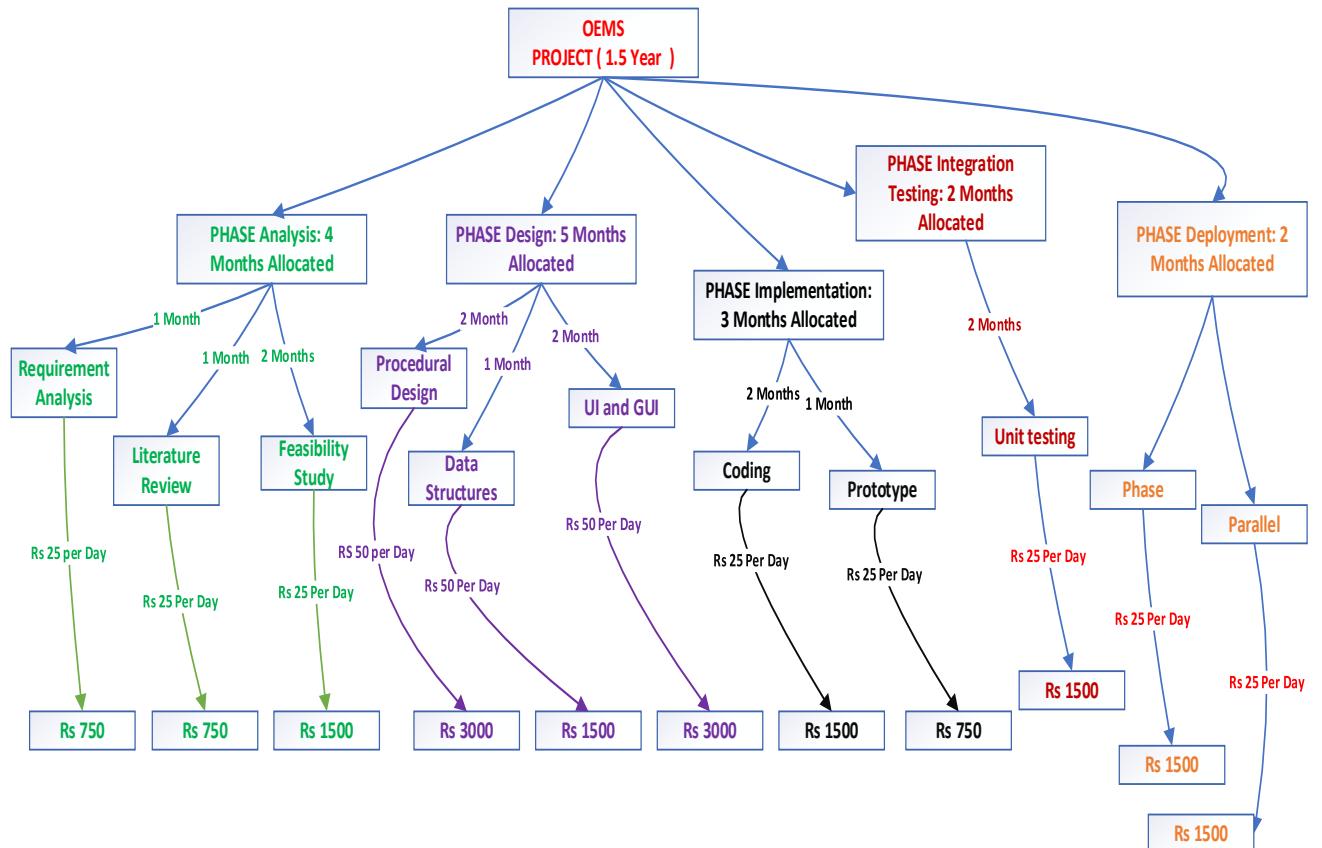


Figure 5: Top-Down Cost Estimation Approach

**Total cost estimation of the Project is:** PHASE Analysis + PHASE Design + PHASE Implementation + PHASE Integration Testing + PHASE Deployment

∴ = Total of each PHASE

$$\Rightarrow (Rs\ 750 * 2 + Rs 1500) + (Rs\ 3000 * 2 + Rs\ 1500) + (Rs 1500 + Rs 750) + (Rs 1500 * 2)$$

⇒ **Total Estimations of Project Cost: Rs 11 850**

#### 8.4.3 Legal Wise

There are no legal issues as at now, since as per Infinity Networks CEO and stakeholders have given all related information's and the go ahead for the project, contracts will be signed between the two parties in due course.

#### 8.4.4 Organisational Wise

Training will be provided to Infinity Networks Staffs and a User manual will be made available.

#### 8.4.5 Schedule Wise

Project will meet the time allocated to and timely prototypes will be issued and demonstrated.

## 8.5 FUNCTIONAL REQUIREMENTS

A function in a software system refers to the inputs, behavior, and outputs of the system. It can be determined by various factors such as computations, data manipulation, business processes, user interactions, or specialized features. The functional requirements (FR) define the specific services that the software must provide, outlining the expected behavior and functionality of the system.

*Table 2: Functional Requirements*

No	Requirement	Description
FR1	User Management	<i>This requirement pertains to the ability to register users on the Online Employee Management System (OEMS), create them as employees, manage employee details, assign employees to departments, modify department information, and create or assign departments as needed.</i>
FR3	Leave Management	<i>This requirement involves functionalities related to leave management, including the creation of employee leave records, assignment of leave balances to employees, adjustment of leave balances as necessary, approval of leave requests, and viewing detailed leave information.</i>
FR4	Payslip Management	<i>This requirement focuses on the creation of employee payslips within the OEMS, with the capability to push payslips to applicable employees and support for printing. The system should efficiently generate accurate payslips for each employee.</i>
FR5	Performance Management	<i>This requirement encompasses features related to performance management, such as creating performance management systems (PMS), defining objectives, providing metrics for evaluation, assigning scores based on metrics, and automatically calculating PMS results.</i>
FR6	Daily work Management	<i>This requirement involves managing daily work tasks within the OEMS, including task creation, assignment to employees, and providing feedback on task progress. Supervisors should be able to oversee and manage tasks efficiently through this system.</i>
FR7	Reports	<i>This requirement pertains to generating reports on various aspects of employee management, including employee details, active and revoked employees, tasks being undertaken, etc. The reports should be exportable and printable for further analysis and documentation purposes.</i>
FR8	Attendance Management	<i>This requirement involves the functionality for employees to log their daily attendance by recording their time in and time out. The system should automatically calculate the number of hours covered by each employee during the day based on their attendance records.</i>
FR 9	NewsFeed Management	<i>This requirement focuses on providing a platform within the OEMS to display the latest company news and videos. Employees should have access to updated news and announcements through this feature, enhancing communication and engagement within the organization.</i>

## 8.6 NON-FUNCTIONAL REQUIREMENT

Non-Functional Requirement (NFR) describes a software system's quality aspect. They assess the software system according to non-functional criteria such as responsiveness, usability, security, portability, and other factors that are essential to the software system's success.

*Table 3: Non-Functional Requirements*

No	Requirement	Description
NFR1	Authentication	<i>This requirement entails implementing a secure authentication mechanism for both employees and supervisors to log in to the system. The authentication process should ensure that only authorized users have access to the system, protecting sensitive data and maintaining system integrity.</i>
NFR2	Backup/Restore	<i>This requirement involves establishing a mechanism for regularly backing up and restoring the entire database of the Online Employee Management System (OEMS). This ensures data integrity and provides a means to recover data in the event of system failures, data corruption, or other unforeseen circumstances.</i>
NFR3	Dashboard	<i>This requirement pertains to designing and implementing a comprehensive dashboard within the OEMS that allows users (both employees and supervisors) to perform all system functions efficiently. The dashboard should provide a user-friendly interface with intuitive navigation and access to all system features and functionalities.</i>
NFR4	Company Directory	<i>This requirement involves creating a company directory within the OEMS that displays information about all employees in the organization. The directory should include details such as employee names, telephone numbers, email addresses, and positions held within the company. This directory serves as a centralized resource for accessing employee information and facilitating communication within the organization.</i>

Some additional features will be added to the system as follows:

*Table 4: Additional Features as NFR*

No	Requirement	Description
NFR5	Export Data	<i>This requirement specifies the capability to export report data from the Online Employee Management System (OEMS) to CSV (Comma-Separated Values) files. Users should have the option to export various types of reports generated by the system into CSV format, allowing for easy data analysis and integration with other applications.</i>
NFR6	Print	<i>This requirement involves providing users with the option to print reports directly from the Online Employee Management System (OEMS) to a physical printer. Users should be able to select the desired reports and initiate the printing process, facilitating the creation of hard copies for record-keeping or distribution purposes.</i>

NFR7	Security	<p>This requirement focuses on enhancing security measures within the OEMS based on user's role. The system should automatically log out users who do not meet the specified role or authorization level assigned to their user accounts. This ensures that sensitive data and system functionalities are accessible only to authorized users, helping to prevent unauthorized access and maintain data confidentiality and integrity.</p>
NFR8	Mobile Application	<p>This requirement focuses in creating a mobile application to be used by employee and be manageable by the administrator via a dedicated application. The mobile app will only be a test purpose (work in progress), where features like company directory, news feed and leaves balances will be made available during the initial release.</p>

## 8.7 ENTITY RELATIONSHIP DIAGRAM

An Entity-Relationship Diagram (ERD) is a visual representation of how different tables in a database are connected. It helps us understand the structure of the database and the relationships between the tables.

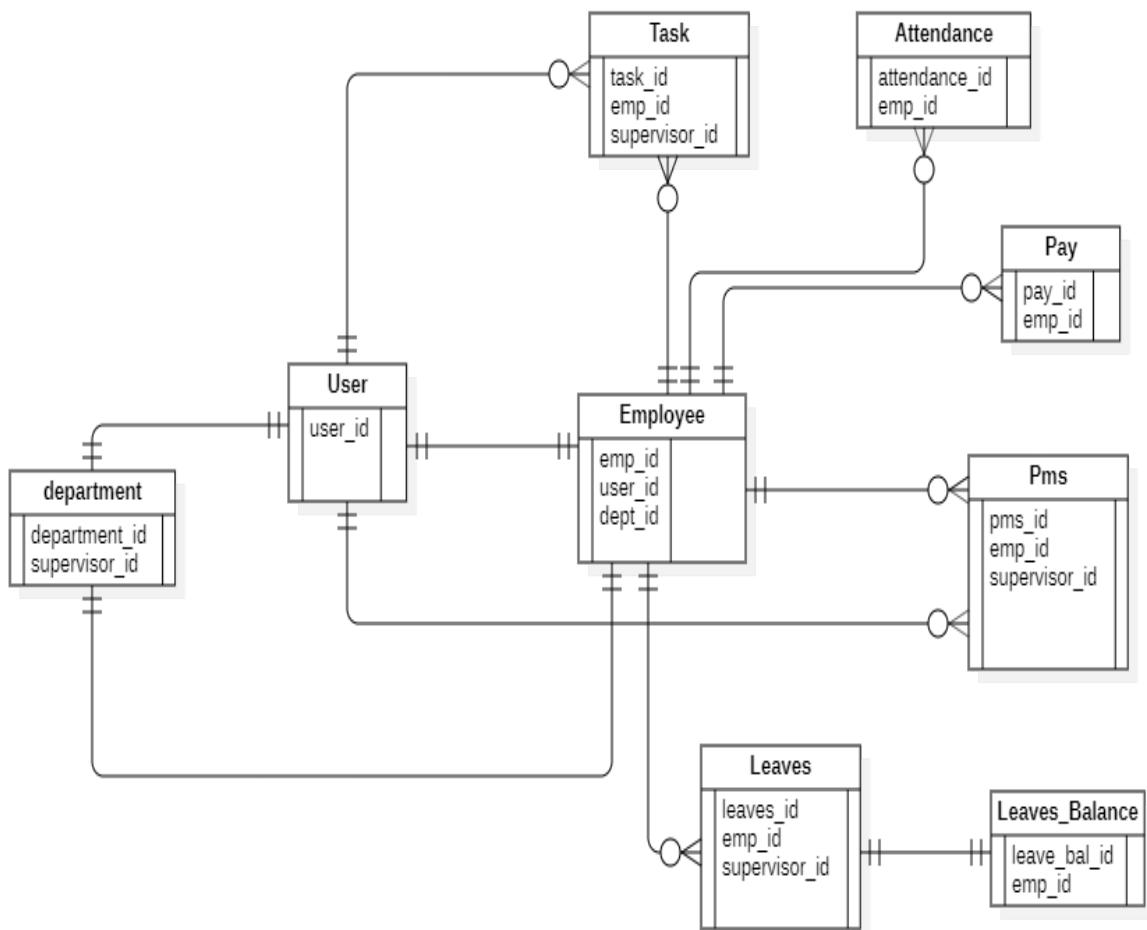


Figure 6: ER Diagram of the System

## 8.8 DATA DICTIONARIES OF THE SYSTEM

### 8.8.1 User Required Information

It will store the user credential, details and will help the system with the role-based authentication.

*Table 5: Database user table*

No	Variable	Type	Constraint	Description
1.	user_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a user.
2.	email	VARCHAR (100)	NN	The email address associated with the user's account.
3.	password	VARCHAR (100)	NN	The hashed and salted password for the user's account.
4.	role	VARCHAR (20)	NN	The role assigned to the user (e.g., employee, manager, administrator).
5.	name	VARCHAR (50)	NN	The first name of the employee.
6.	surnames	VARCHAR (50)	NN	The last name of the employee.
7.	isActive	Boolean	NN	Represent UAC, used for verify if user has access to system, by default is 1

### 8.8.2 Employee Required Information

It will store the employee details.

*Table 6: Database employee table*

No	Variable	Type	Constraint	Description
1.	emp_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of an employee.
2.	user_id	VARCHAR (10)	FK	Foreign key from user table representing the unique identifier of a user.
3.	nic	VARCHAR (20)	NN	National Identity card Number
4.	mobile_number	VARCHAR (8)	NN	The mobile number of the employee.
5.	phone_number	VARCHAR (7)	NN	The phone number of the employee.
6.	address	VARCHAR (200)	NN	The address of the employee.
7.	emergency_contact_name	VARCHAR (100)	Null	The name of the employee's emergency contact person.
8.	emergency_contact_number	VARCHAR (7)	Null	The phone number of the employee's emergency contact person.
9.	date_joined	DATE	NN	Date Employee Joined company
10.	qualification	VARCHAR (100)	Null	Highest Academic Qualification
11.	department	VARCHAR (100)	NN	Department where employee is assigned to
12.	basic_salary	Integer (8)	Null	Employee basic salary
13.	Profile_picture	VARCHAR (1000)	NN	Employee Profile Picture
14.	position	VARCHAR (255)	NN	Employee position within the company

### 8.8.3 Leaves Required Information

It will store employee leaves applications.

*Table 7: Database leave table*

No	Variable	Type	Constraint	Description
1.	leave_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a leave request.
2.	emp_id	VARCHAR (10)	FK	Foreign key referencing the employee who requested the leave.
3.	start_date	DATE	NN	The start date of the leave request.
4.	end_date	DATE	NN	The end date of the leave request.
5.	leave_type	VARCHAR (50)	NN	The type of leave requested (e.g., vacation, sick leave).
6.	approval_status	VARCHAR (50)	NN	The status of the leave request (e.g., pending, approved, rejected).
7.	leave_reason	VARCHAR (200)	NN	The reason or description of the leave request.
8.	leave_total	INT	NN	The total number of days employee is taking as leave derived from subtracting start date from end date
9.	sup_id	VARCHAR (10)	NN	Supervisor Id for leaves approval
10.	absence_status	VARCHAR (50)	NN	Status of absence, confirmed or planned.

### 8.8.4 Leaves Balance Required Information

It will store employee leaves balances of employees.

*Table 8: Database Leaves Balance Table*

No	Variable	Type	Constraint	Description
1.	bal_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a balance request.
2.	leave_id	VARCHAR (10)	FK	Foreign key referencing the employee who requested the leave.
3.	emp_id	VARCHAR (10)	NN	Referencing the employee id from employee table
4.	bal_wellness	VARCHAR (50)	NN	The leave balance for wellness
5.	bal_vacation	VARCHAR (50)	NN	The leave balance for vacation
6.	bal_sick_leave	VARCHAR (200)	NN	The leave balance for sick leave

### 8.8.5 Payslip Required Information

It will store all related information about Payslip.

*Table 9: Database payslip table*

No	Variable	Type	Constraint	Description
1	pay_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a payslip.
2	emp_id	VARCHAR (10)	FK	Foreign key referencing the employee associated with the payslip.
3	month	VARCHAR (10)	NN	The pay period covered by the payslip.
4	year	INT	NN	The payslip year
5	basic_salary	FLOAT	NN	The basic salary amount for the pay period.
6	deductions	FLOAT	NN	Employee deductions
7	medical_contri	FLOAT	NN	Medical Contribution
8	nsf_contri	FLOAT	NN	National Savings Fund Contribution
9	csg_contri	FLOAT	NN	CSG Contribution Employee
10	bus_fare	FLOAT	NN	Bus Fare for period
11	overtime	FLOAT	NN	The additional allowances or bonuses for the pay period.
12	net_pay	FLOAT	NN	The net salary amount after deductions and allowances.
13	pay_status	VARCHAR (10)	NN	The payment status

### 8.8.6 PMS Required Information

It will store all related information for the functioning of the performance management system.

*Table 10: Database pms table*

No	Variable	Type	Constraint	Description
1	pms_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a performance evaluation.
2	emp_id	VARCHAR (10)	FK	Foreign key referencing the employee being evaluated.
3	supervisor_id	VARCHAR (10)	NN	References supervisor on employee table
4	quarter_array	VARCHAR (255)	NN	Array that stores the information's such as quarter, pms period
5	kpa_array	VARCHAR (255)	NN	Array that stores the information's of Key Performance areas
6	kpi_array	VARCHAR (255)	NN	Array that stores the information's of Key Performance Index
7	objctives_array	VARCHAR (255)	NN	Array that stores the pms objectives
8	metric_array	VARCHAR (255)	NN	Array that stores the metrics input by employee
9	score_array	VARCHAR (255)	NN	Array that stores the score input by either Administrator or Supervisor
10	management_status	VARCHAR (255)	NN	Status of pms at management level (OB, MU, SU)
11	remarks	VARCHAR (255)	Null	Remarks left by employee, supervisor or management team
12	pms_status	VARCHAR (50)	NN	Status of the PMS (Completed, n+1, n+2)

### **8.8.7 Attendance Related Information**

It will store all related information for the functioning of the attendance management.

*Table 11 Database: Table Attendance*

No	Variable	Type	Constraint	Description
1	attendance_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of an attendance record.
2	emp_id	VARCHAR (10)	FK	Foreign key referencing the employee associated with the attendance record.
3	date	DATE	NN	The date of the attendance record.
4	time_in	TIME	NN	The time when the employee checked in.
5	time_out	TIME	NN	The time when the employee checked out.
6	hours_covered	VARCHAR (4)	NN	Hours covered during the day
7	Year	YEAR (4)	NN	Calendar year
8	month	VARCHAR (2)	NN	Calendar month

### **8.8.8 Task Related Information**

It will store all related information for the functioning of the attendance management.

*Table 12 Database: Task Table*

No	Variable	Type	Constraint	Description
1	task_id	Integer	PK	Primary key column representing the unique identifier of a task.
2	emp_id	Integer	FK	Foreign key referencing the employee to whom the task is assigned.
3	supervisor_id	Integer	NN	Foreign key referencing the supervisor who allocated the task.
4	task_name	VARCHAR (100)	NN	The name or title of the task.
5	description	VARCHAR (500)	NN	The description or details of the task.
6	deadline	DATE	NN	The deadline or due date for the task.
7	status	VARCHAR (20)	NN	The status of the task (e.g., pending, in progress, completed).
8	progress	INT	NN	The progress or completion percentage of the task.
9	feedback	VARCHAR (500)	NN	The feedback or comments related to the task.

### **8.8.9 Department Related Information**

It will store all related information for the functioning of the department module.

*Table 13 Database: Department Table*

No	Variable	Type	Constraint	Description
1	department_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a department.
2	departmentName	VARCHAR (100)	NN	The name of the department.
3	departmentSupervisor	VARCHAR (11)	FK	Foreign key referencing the employee who is the supervisor of the department.
4	departmentDetails	VARCHAR (255)	NN	The information of department

### 8.8.10 Newsfeed Related Information

It will store all related information for the functioning of the newsfeed module.

Table 14 Database: News Feed Table

No	Variable	Type	Constraint	Description
1	news_id	VARCHAR (10)	PK	Primary key column representing the unique identifier of a news feed post.
2	image	VARCHAR (255)	NN	Stores all images
3	Video_link	VARCHAR (255)	NN	Stores all video links
4	date_posted	DATE	NN	The date and time when the news feed post was created.
5	title	VARCHAR (100)	NN	The title or subject of the news feed post.
6	isActive	Boolean	NN	Sets the news active or archived.
7	content	VARCHAR (1000)	NN	The content or information of the news feed post.

### Table Legend

No	Acronym	Meaning
1	PK	Primary Key
2	FK	Foreign Key
3	Null	Optional
4	NN	Not Null, Mandatory

### 8.8.11 Data Dictionaries to Database Structure

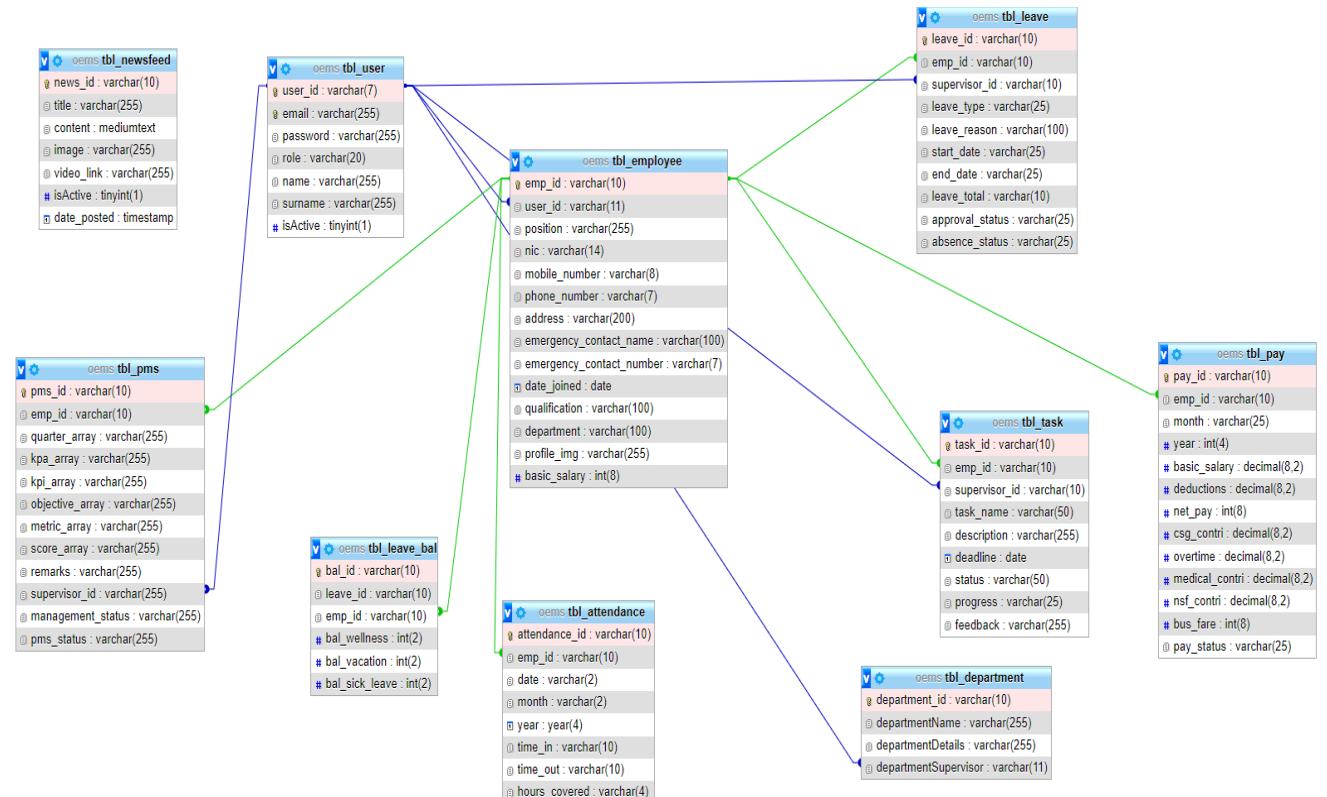


Figure 7: Database Structure

## **8.9 RISK MANAGEMENT & RISK ANALYSIS**

Project risk refers to anything that could cause problems with a project's schedule. Risk analysis is a way to identify and understand these potential issues. It involves looking for risks, figuring out how they could affect the project, and taking steps to manage and control them. It's about being proactive and dealing with risks before they become big problems.

### **8.9.1 Risk Identification**

#### ***8.9.1.1 Organizational Risk***

Organizational risk pertains to potential challenges stemming from human resources or the testing team within a project. For instance, a lack of technically skilled members poses a risk to the project. Additionally, insufficient manpower to meet project deadlines represents another organizational risk.

#### ***8.9.1.2 Technical Risk***

Technical risk refers to the likelihood of experiencing losses while executing a technical process, such as untested engineering or incorrect testing procedures. These risks arise from technical complexities and uncertainties inherent in the project's technical aspects.

**Resolution for Mentioned Risk:** To mitigate those risks, it is important to provide adequate training on the technology to be used and ensure timely updates and alignment with the project's functional requirements. Additionally, meeting the testing deadline before deploying the services is crucial.

## **8.10 DATA USED FOR PMS, PAYSLIP AND LEAVES MANAGEMENT**

### **8.10.1 PMS Management**

The metrics and flow of information utilized in the Performance Management System (PMS) represent a culmination of my 12 years of professional experience. This model prioritizes transparency and empowers employees by providing them with a more convenient and accessible platform for conducting performance assessments.

By leveraging this system, employees are equipped with the tools they need to actively participate in the performance evaluation process, ultimately fostering a culture of transparency and accountability within the organization.

#### ***8.10.1.1 The Flow***

The Performance Management System (PMS) process begins with the HR Administrator creating PMS objectives, which are then checked and stored in the database with statuses set to "OB" for management and "n+1" for PMS. Employees interact with the system by adding metrics, which are again checked and stored in the database with statuses set to "MU" for management and "n+2" for PMS. The system then notifies the supervisor for action. The supervisor adds scores, which are checked, stored in the database with statuses set to "SU" for management and "Completed" for PMS. Finally, the system automatically calculates the PMS score and result for the employee under the supervisor.

Table 15: PMS Management Metrics

Range of Achievement	Score	Definition
<b>Far Exceeded - 111% and above 120%</b>	30	The employee greatly exceeded expectations of the objective; the result was exceptional resulting a highly significant impact and played a vital role in achieving critical work unit, with the objective (e.g., saved significant time or money)
<b>Exceeded - 101% and up to 110%</b>	21 up to 29	The employee exceeded expectations of the objective; the results surpassed the employee's work required very few minor revisions or changes (fewer than expected). The objective was exceeded with less guidance and support than standards for quality and quantity, and the timeframe associated with the objective
<b>Met - 90% up to 100%</b>	16 up to 20	The employee fully met the expectations of the objective; the result met the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective (e.g., met designated budget and/or timeframe) and was achieved with the appropriate level of guidance.
<b>Nearly there - 60% up to 89%</b>	1 to 15	The employee partially met the expectations of the objective; the result fell short of meeting the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective.
<b>Did not achieve - less than 60%</b>	0	The employee did not meet the expectations of the objective even though circumstances allowed for its achievement

## 8.10.2 Leave Management

The leave management system in OEMS adheres to the regulations outlined in the Mauritius Law, specifically the Workers Right Act 2019. Changes have been made to accommodate the allocation and implementation of leaves in the private sector. For instance, a new category called Wellness Leave has been introduced, allowing employees to take a maximum of 5 days leave per year for their well-being. Sick leave entitlement remains at 22 days as stipulated by the WRA 2019. Vacation leave has been adjusted to a maximum of 90 days, with the HR Administrator having the authority to modify leave entitlement based on the employee's years of service.

### 8.10.2.1 The Flow

In the leave management system, the process for requesting and approving leave follows a standard flow. When an employee requests leave, the application is submitted through the system. The request is then sent to the employee's assigned supervisor for approval. The supervisor has the authority to either approve or reject the leave request. Similarly, if a supervisor needs to request leave, they follow the same procedure of applying through the system. However, in this case, the leave request is forwarded to the HR Administrator for approval. The HR Administrator holds the ultimate authority to approve leave requests for both employees and supervisors within the organization.

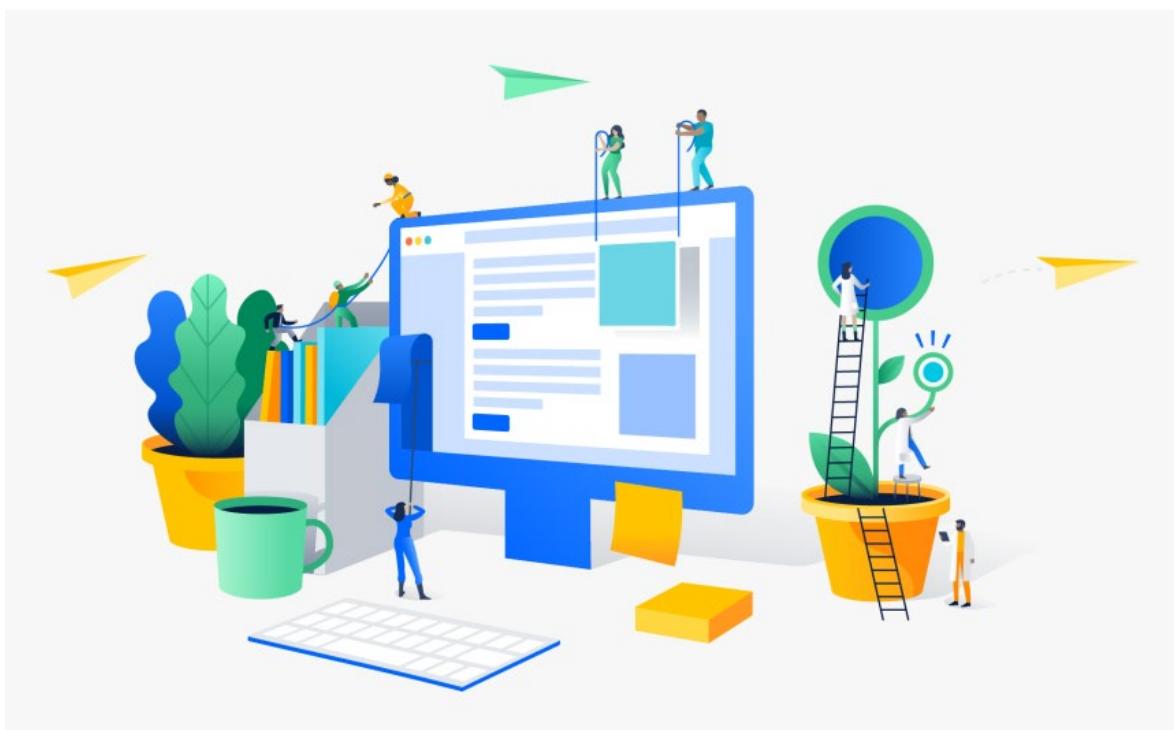
## 8.10.3 Payslip Management

The official percentage of deductions below contributions as follows:

- Medical Contribution: 1% of basic salary
- NSF Contribution: 1% of basic salary
- CSG Contribution: 1.5% of basic salary



## SYSTEM DESIGN



**INFINITY  
NETWORKS**

## **9 SYSTEM DESIGN**

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### **9.1 QUICK REVIEW**

The requirement specifications from the first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and helps in defining overall system architecture. The software code to be written in the next stage is created now.

### **9.2 DEVELOPMENT PLATFORM REQUIREMENTS**

System requirements are the configuration that a system must have for it to function properly. Installation or performance issues may arise if these conditions are not met by a device or application's manufacturer or third-party software provider

#### **9.2.1 Front-End Software/Packages Selection**

Since the website need to be user friendly, easy to maintain, easy to debug and must have a cross-platform compatibility therefore below is the minimum development software requirement specifications for developing this project:

<b>Presentation layer</b>	:	CSS3, HTML5, JS, BOOTSTRAP
<b>Documentation Tool</b>	:	Microsoft Office   Libre Office
<b>Web Development Software:</b>	:	Sublime Text   Notepad ++   Visual Studio
<b>Debugging Software</b>	:	Firefox Developer   Google Chrome

#### **9.2.2 Back-End Software/Packages Selection**

The System must be secure; therefore, the backend will be providing security to the system by using a username and password. It must also enable backup of the database, should be easy to install and do manipulation as when required and lastly must be able to handle data efficiently.

<b>Data layer</b>	:	PHP 7, MySQL
<b>Documentation Tool</b>	:	Microsoft Office   Libre Office
<b>Web Development Software:</b>	:	Sublime Text   Notepad ++  Visual Studio
<b>Debugging Software</b>	:	Firefox Developer   Google Chrome

#### **9.2.3 Hardware Selection**

Hardware refers to the collection of internal electrical circuits and exterior physical elements utilized in the construction of a computer. The minimum hardware requirement specifications for developing this project are as follows:

<b>Processor</b>	:	Standard processor with a speed of 1.6 GHz
<b>RAM</b>	:	512 MB RAM or more
<b>Hard Disk</b>	:	4 GB or more
<b>Monitor</b>	:	Standard color monitor
<b>Keyboard   Mouse:</b>	:	Standard keyboard, Mouse

### 9.3 UML USE CASES

It captures the system's functionality and requirements by using actors and use cases. High-level functionalities and how a user will utilize the system are represented by use cases, rather than high-level functions and services.

#### 9.3.1 Why Use-Case diagram?

Use case diagrams show how a live system behaves. It simulates how a third party interacts with the system to make it function. Use case diagrams oversee representing the outside factors interacting with a component of the system, as well as the components within the system itself.

Based on the project case study of the for the Online Employee Management System (OEMS) where the three actors interact with the system namely:

- Employees
- Human Resources Administrator
- Employee's Supervisor

#### **ACTOR: Human Resource Administrator**

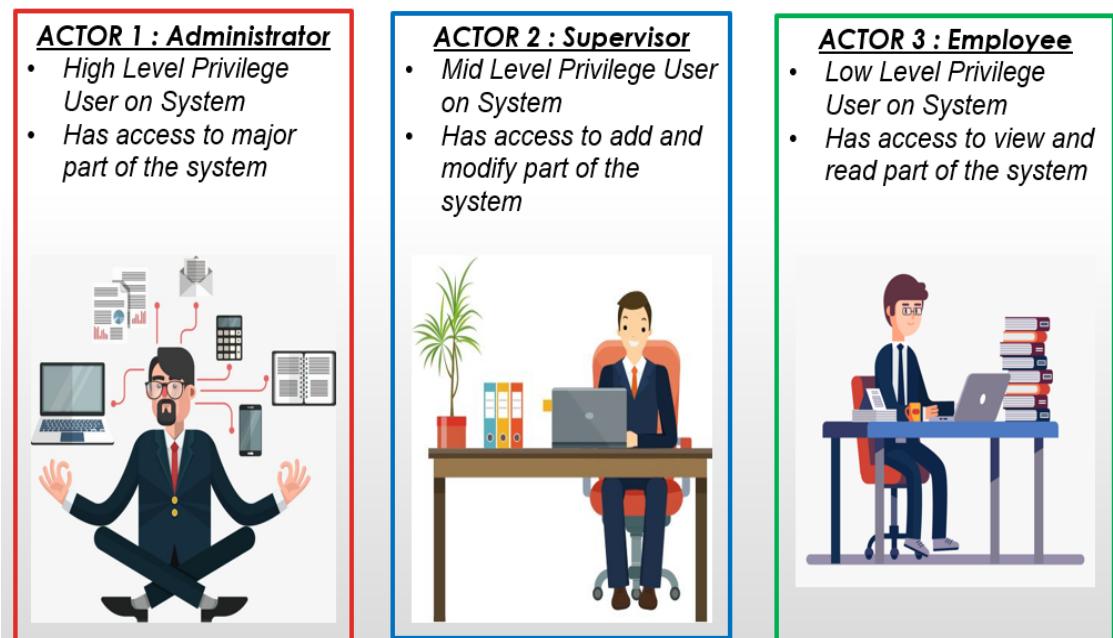
He will have the High-level user privilege on the system.

#### **ACTOR: Supervisor**

He will have the Mid-level privilege on the system.

#### **ACTOR: Employee**

He will have the user-level privilege on the system.



### 9.3.2 OEMS Use Case Diagram

The representation Figure 7, which is the system interaction with each user have been drawn up in a use case diagram where, each actor has been related to tasks that they can perform as a user on the system.



Figure 8: Use Case Diagram OEMS

Additional Features have not been included in the use case diagram and the features as follows:

1. System → Searching and Sorting are automatically done
2. System → Export reports to CSV automatically
3. System → Displays Company Directory automatically upon request

### 9.3.3 UML OEMS Class Diagram

A visual notation used to build and visualize object-oriented systems is the UML Class diagram. An example of a static structural diagram is a class diagram in the Unified Modelling Language (UML), which demonstrates a system's:

- classes,
- their attributes,
- operations (or methods),
- and the relationships among objects.

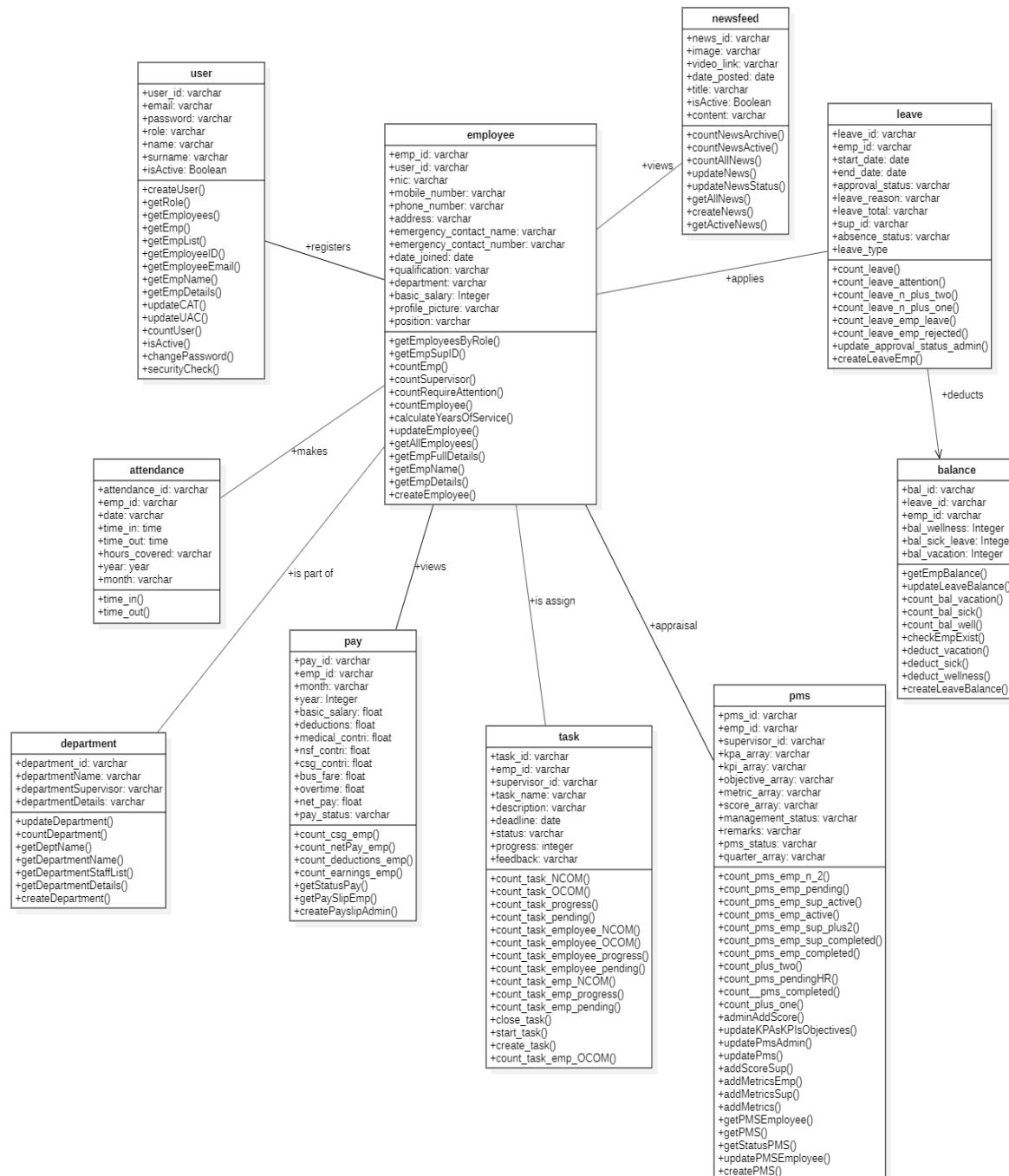


Figure 9: Class Diagram OEMS

### 9.3.4 Sequence Diagram for User Creation on a RBAC

A sequence diagram is a diagram that shows the flow of messages sent and received by objects during an interaction. Figure 11 represents the sequence where administrator creates a user on the system.

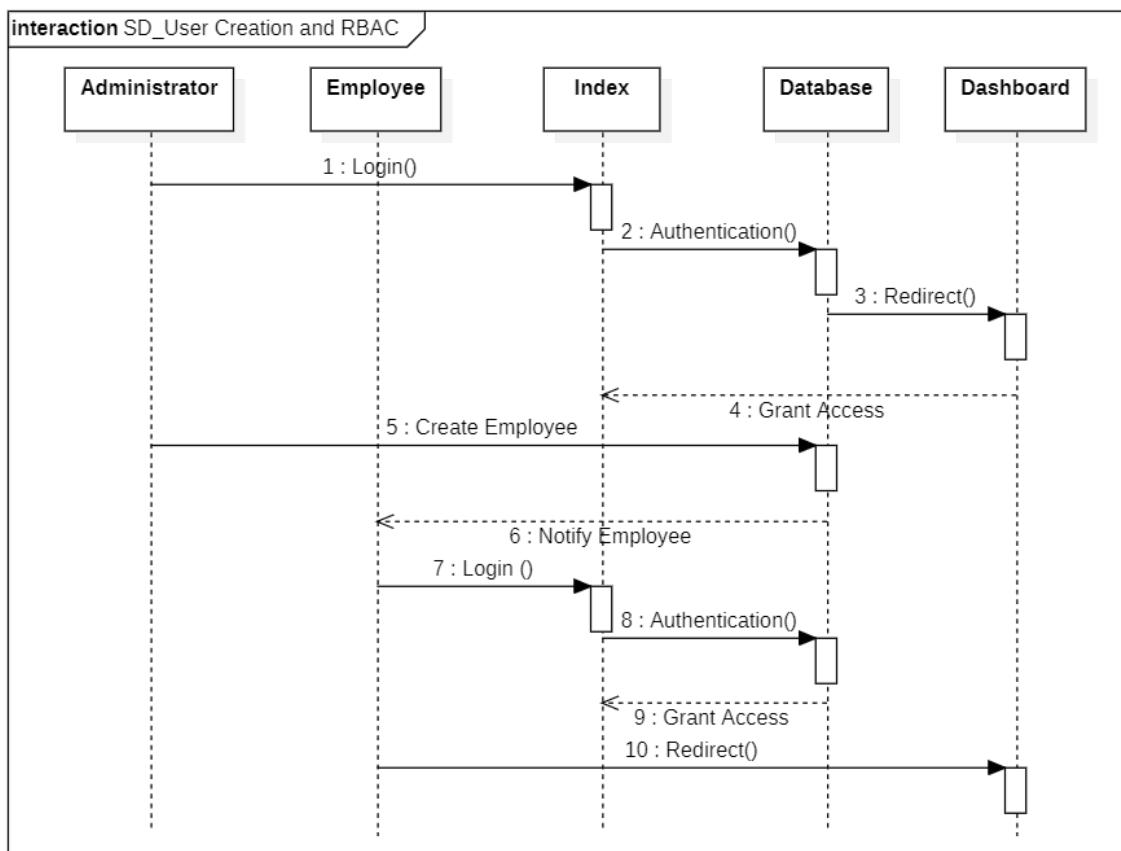


Figure 10: User Creation on a RBAC in OEMS

The Above sequence describes the interaction of actors with the system as below:

**Registration Process:** Administrator → Fill In details → Based on Category → Fill Additional Details → Database is updated accordingly

**Login Process:** Employee → Enter Email and Password → System Verify Details on Database → If Valid Information → Redirect User based on its Category → Dashboard → Verify User Category → Index pages

### 9.3.5 Sequence Diagram for Daily Task Management

Task management involves two main actors: employees and supervisors. The system acts as a bridge between these two actors, ensuring that tasks are successfully registered in the system, displayed on the Task Management page, and updated continuously by the employee.

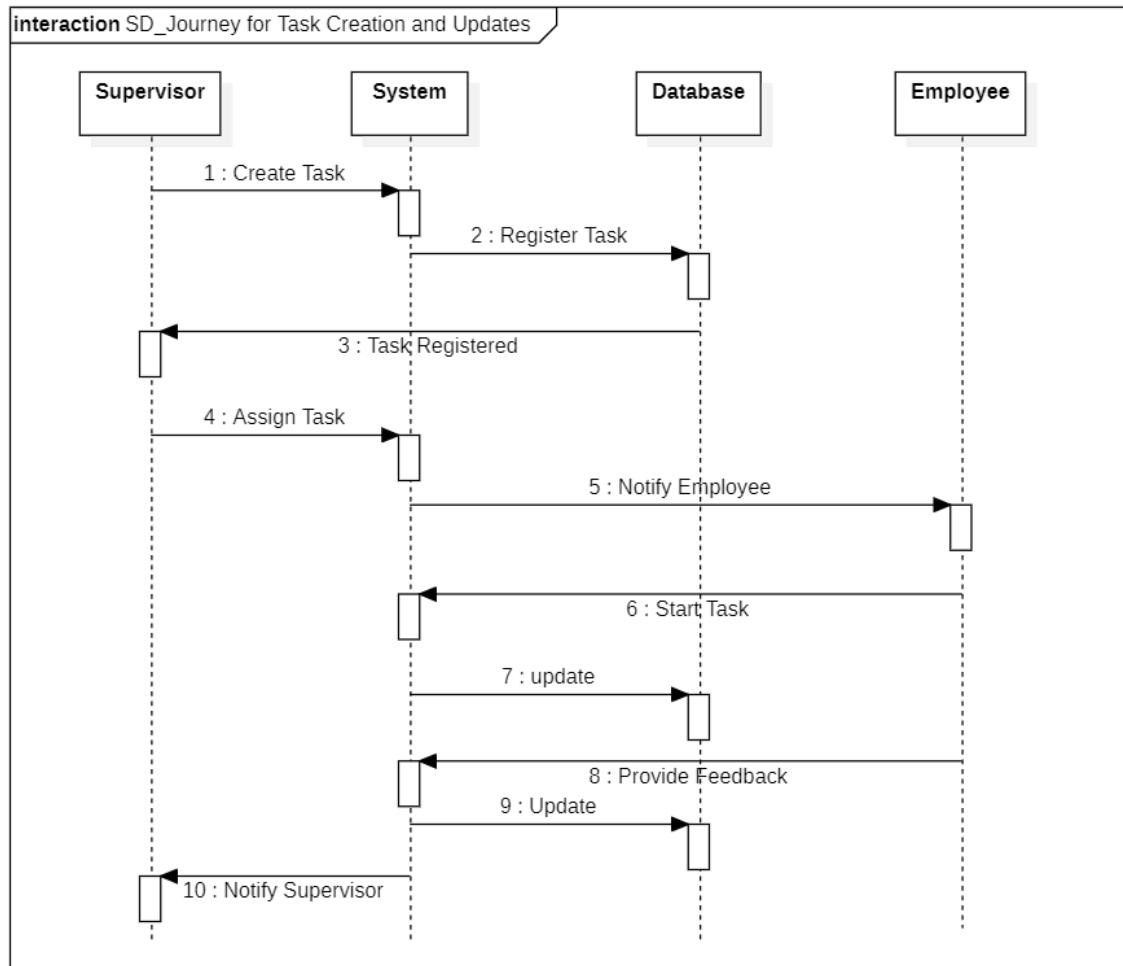


Figure 11: Sequence for Daily Task Management

**Task Creation Process:** Supervisor → Create Task and assign to employee → System → Register Request → Data is transferred to Database → System automatically create task and notify assigned employee

**Task Process:** Employee → Start Task → System Update Task Status → System send Notification to Supervisor if Task Completed → Task Status is updated upon Employee Completes the process for task with feedback

### 9.3.6 Sequence Diagram for Leaves Management

Leaves management involves the employee and the system. The system processes data to ensure that the correct employee information is provided for different types of leaves such as Wellness leaves, vacation leaves, or sick leaves. The system verifies the employee's eligibility for these leaves and prompts a notification if necessary.

In the above case (Employee): leaves are tagged in 2 categories who is under supervision of an assigned Supervisor, all the leaves are tagged as “Pending at N+1”, and require supervisor approval.

Case (Supervisor): Leaves are tagged as “Pending N+2”, which represent interaction between supervisor and HR Administrator, who only has the rights to approve the leaves.

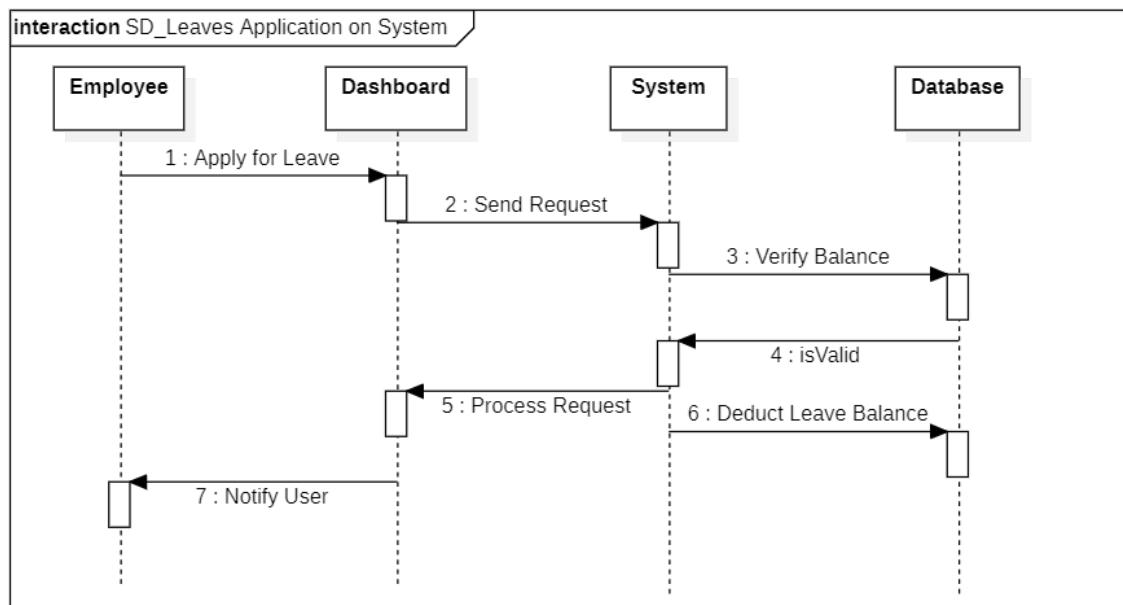


Figure 12: Sequence for Leaves Management

The Above sequence describes the interaction of actors with the system as below:

**Leave Process:** Employee → Apply for Leave → System performs checks to verify leave balance → If Valid → Process Request for Leave → Leave is tagged as Absence Status = “Confirmed” → Status is marked as “Pending at N+1”

**Leave Approval:** CASE: Supervisor → Approves Leaves → system automatically deduct the leave from employee leave balance → system automatically changes the Absence Status.

CASE: HR Administrator → Approves Leaves → system automatically deduct the leave from employee leave balance → system automatically changes the Absence Status.

### 9.3.7 Sequence Diagram for Performance Management System

The Performance Management system involves the employee and supervisor who interact with the system for a point-based evaluation. The supervisor defines objectives and assigns them to the employee. The employee fills in the required input details and submits them to the supervisor. The supervisor then verifies the input data against the set metrics and provides a rating for the employee.

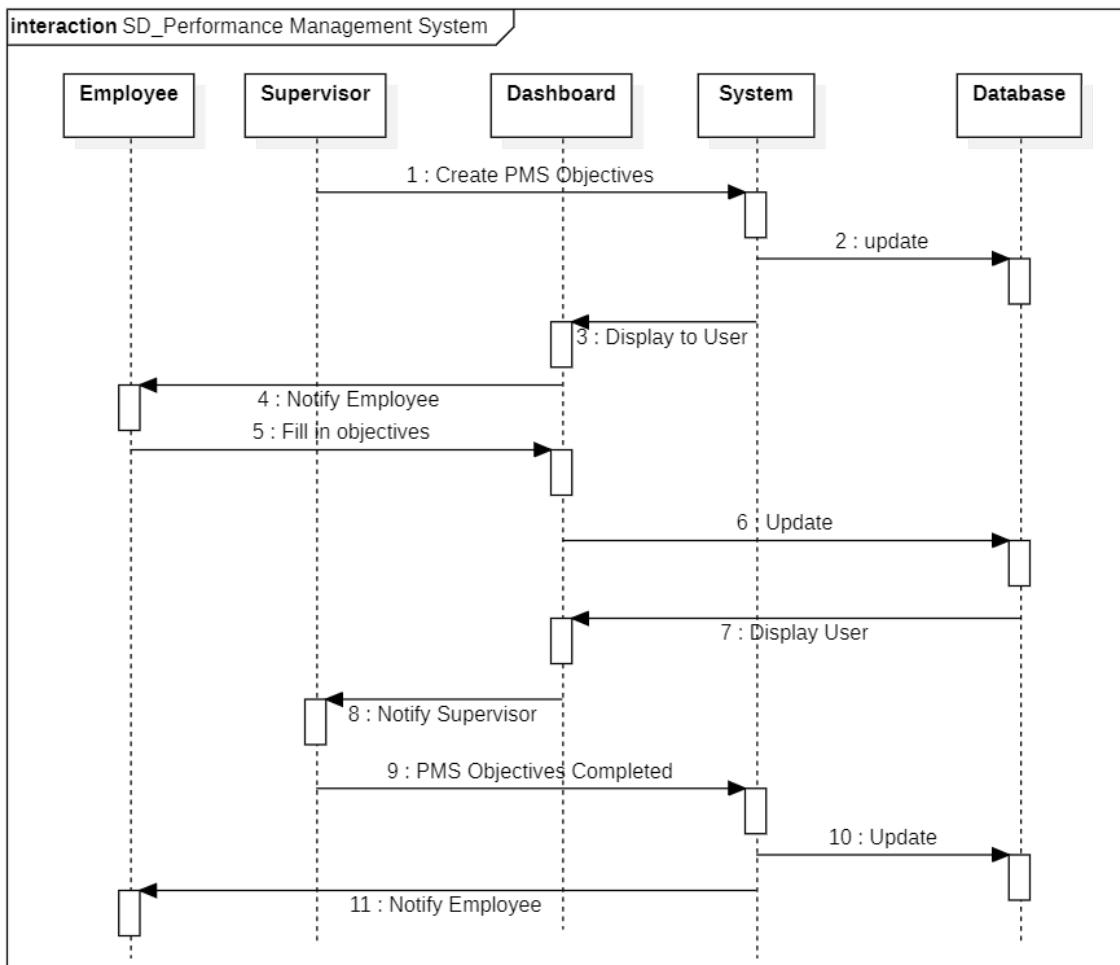


Figure 13:PMS System

The Above sequence describes the interaction of actors with the system as below:

**Creation of PMS Process:** HR Administrator → Create PMS Objectives → System performs checks and post it to Database → The management\_status is set to “OB” and pms\_status is set to “n+1” → Employee gets PMS Objectives

**Employee Interaction with PMS Process:** Employee → Add Metrics → System performs checks and post it to Database → The management\_status is set to “MU” and pms\_status is set to “n+2” → System Notifies Supervisor for action.

**Supervisor Interaction with PMS Process:** Supervisor → Add Scores → System performs checks and post it to Database → The management\_status is set to “SU” and pms\_status is set to “Completed” → System automatically calculates the PMS Score and PMS Result for the Employee under supervisor.

### 9.3.8 Sequence Diagram for Payslip Generation

The Payslip Generation involves interaction between the employee and the system. Payslip is created by the Human Resources Administrator, and input data is provided. Upon creation of payslip, the system automatically updates database and same is added to employee payslip dashboard.

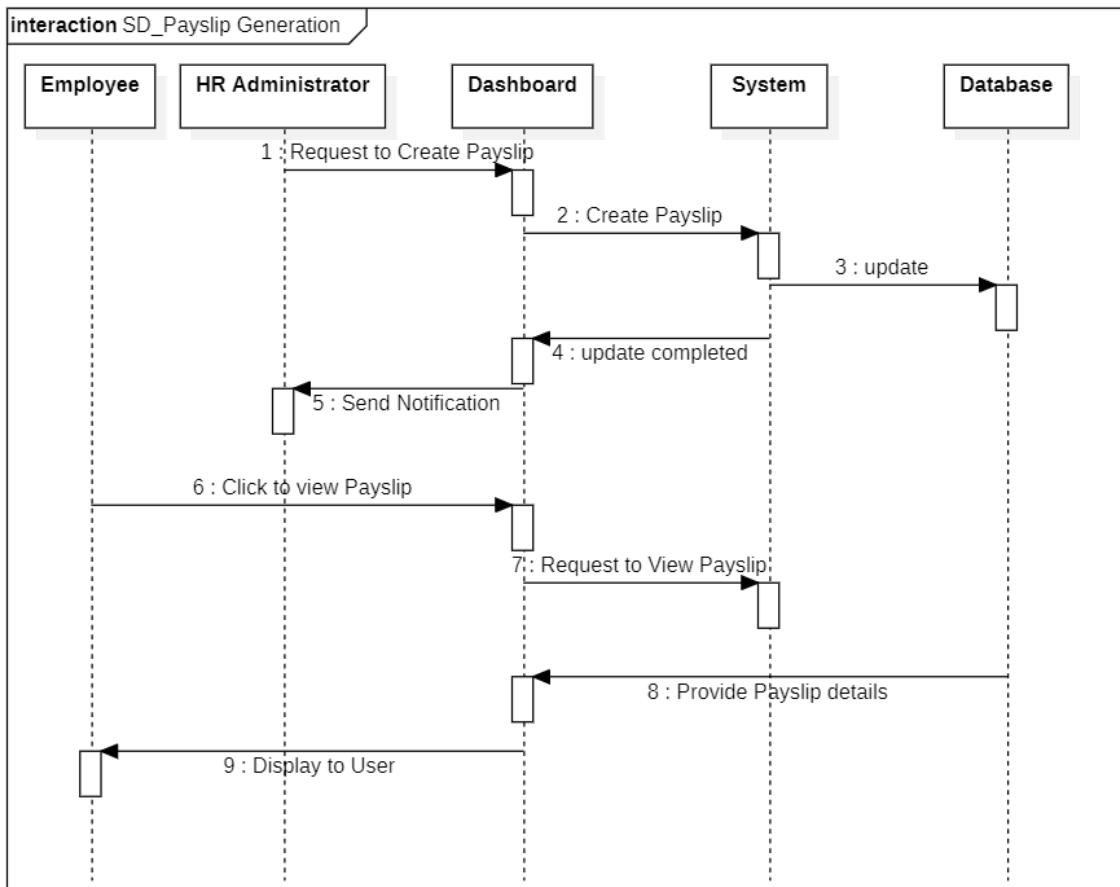


Figure 14: Payslip Generation

The Above sequence describes the interaction of actors with the system as below:

**Creation of Employee Payslip Process:** HR Administrator → Make request to Create Employee Payslip → HR Admin selects Month and Year → HR Admin → Inputs Overtime and Bus Fare where applicable → System automatically calculates the Earnings, Deductions and Net pay → System updates and post data to database.

**Employee View Payslip Process:** Employee → Make request to view his Payslip → System makes a view and process request → System displays the payslip → Provides printing support for employee.

### 9.3.9 Sequence Diagram for Daily Attendance

The Daily Attendance involves interaction between the employee and the system. Employee has to login onto the system and register his or her time in, upon pressing the button, the system automatically updates the time and date to the database and record are saved.

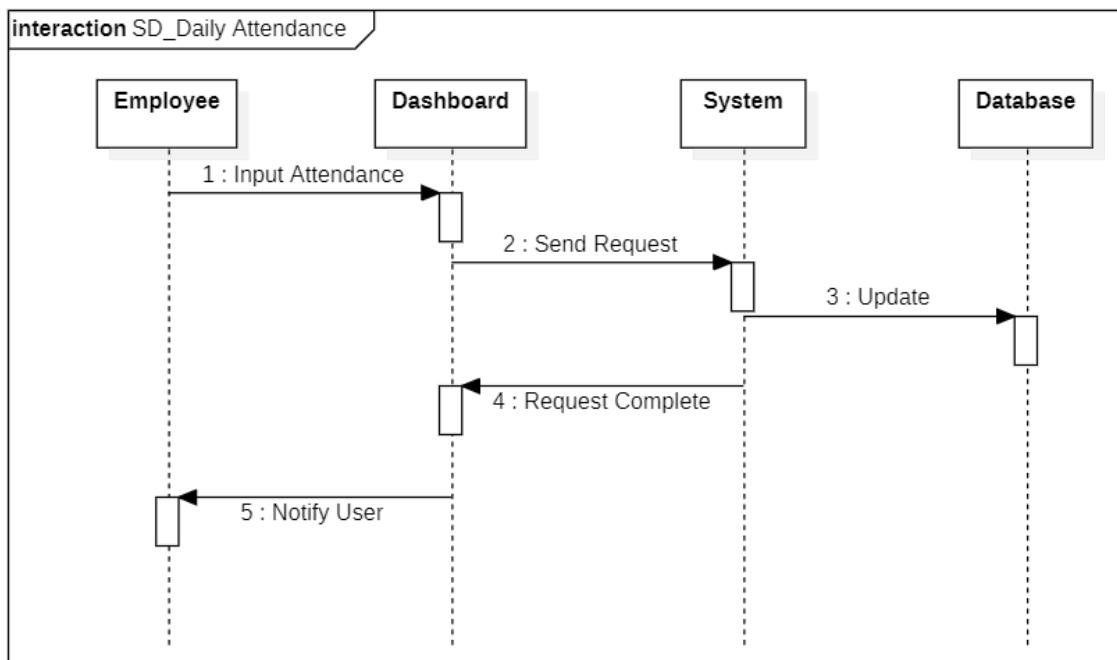


Figure 15: Sequence for Daily Attendance

The Above sequence describes the interaction of actors with the system as below:

**Attendance (Time In) of Employee Process:** Employee → Make request to Time In → System automatically make request and Post the Time, date, month to database → Display Message to Employee

**Attendance (Time Out) of Employee Process:** Employee → Make request to Time out → System automatically make request and Post the Time, date, month to database → System calculates the number of hours covered during the day → Display Message to Employee

### 9.3.10 Sequence Diagram for Personal Information Management

The Personal Information Management involves interaction between the employee and the system. Employee can view his/her personal information's, can update information wherever required.

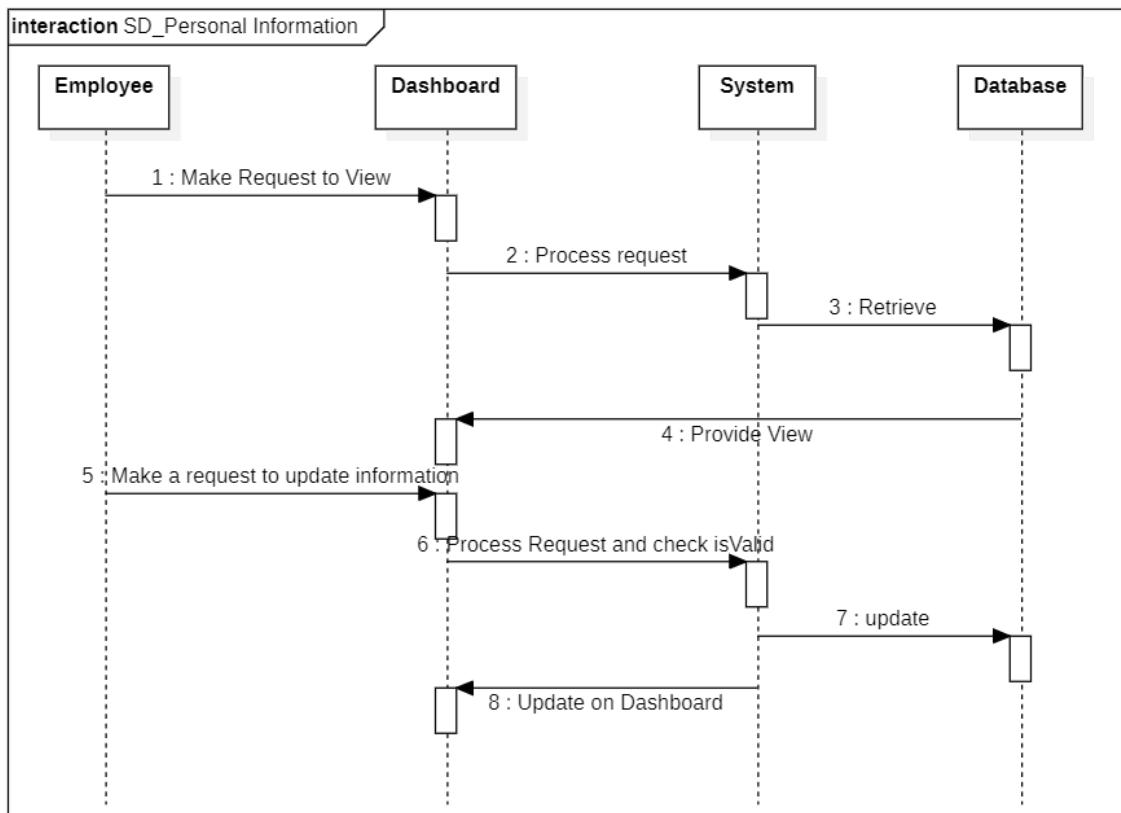


Figure 16: Personal Information Management

This algorithm focuses specifically on the employee's ability to change their password, with all other changes managed by the HR Administrator.

Step	Description
1	Open Personal Information Page
2	Select "Change Password" Option
3	Enter Current Password
4	Enter New Password
5	Confirm New Password
6	Submit Password Change Request
7	Check if form details are valid
8	If valid, System Updates Password ELSE If invalid, Prompt Error Message and Request Correction
9	Display Confirmation Message
10	End Process

### 9.3.11 Sequence Diagram for NewsFeed Management

Interaction between the HR Administrator and the Online Employee Management System (OEMS) for managing company news updates. The HR Administrator have the capability to create and publish news articles or updates through the system. Once a news item has been created and published by the HR Administrator, the system automatically displays it on the NewsFeed dashboard of all users. This feature enables efficient communication of important company announcements, events, or updates to all employees, fostering transparency and engagement within the organization.

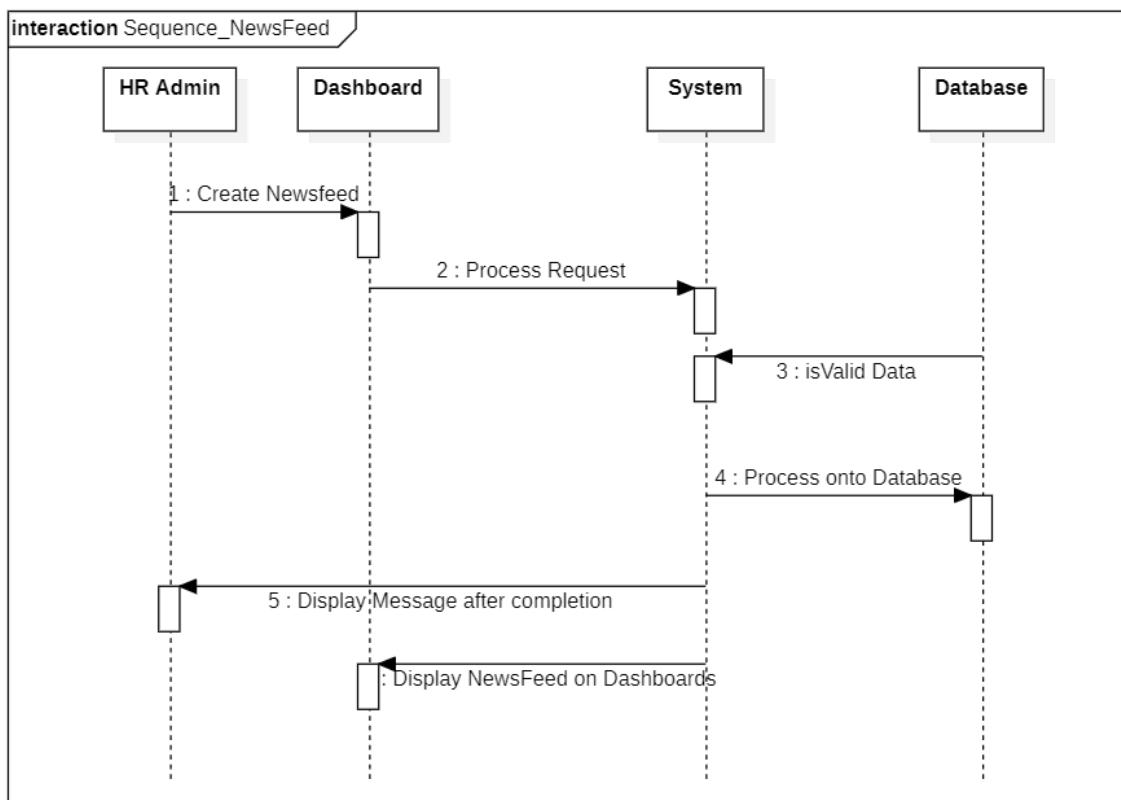


Figure 17: NewsFeed Management

The Above sequence describes the interaction of actors with the system as below:

**NewsFeed Process:** HR Administrator → Make request to Create News → Fill In details → Select News Type → System Verify if Data Valid → System automatically process request and Post data to database → Display NewsFeed on Dashboard

## 9.4 LOGIC DIAGRAMS & ALGORITHMS DESIGN

The goal of procedural design is to convert structural components into a software procedural description.

### 9.4.1 Flowchart for User Authentication using RBAC

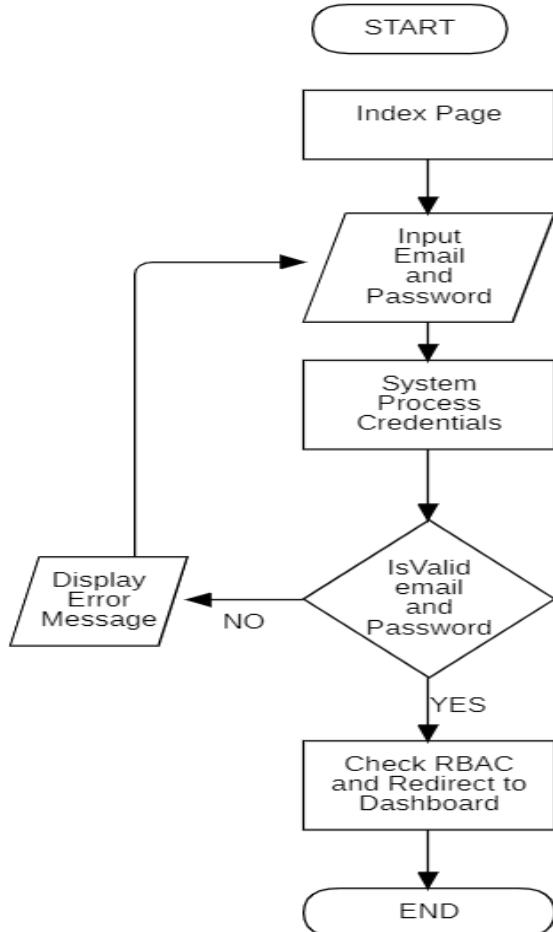


Figure 18: Flowchart User Authentication using RBAC

#### 9.4.1.1 Algorithm: User Authentication using RBAC

Step	Description
1	Open the Index Page.
2	Enter the Email and Password in the designated fields.
3	The entered data is processed by the system (Email and Password).
4	Check if the Email and Password are valid: <ul style="list-style-type: none"> <li>- If the Email and Password are valid:</li> <li>- Check Role-Based Access Control (RBAC) and authenticate the user.</li> <li>- If authentication is successful, redirect the user to the dashboard.</li> </ul> - If the Email and Password are not valid: <ul style="list-style-type: none"> <li>- Prompt an error message indicating incorrect credentials.</li> <li>- Request the user to re-enter the correct Email and Password.</li> </ul>
5	End.

Table 16 Algorithm: User Authentication using RBAC

### 9.4.2 Flowchart for Creating Employee on System by HR Administrator

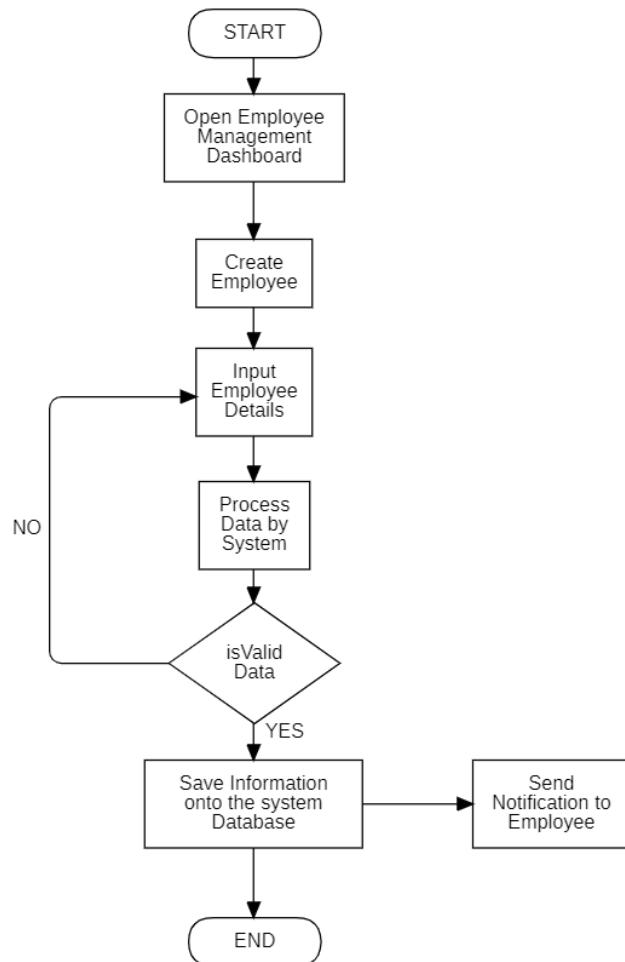


Figure 19: Flowchart Employee Creation by HR Administrator

#### 9.4.2.1 Algorithm: Creating Employee on System by HR Administrator

Step	Description
1	Open the User Management Page.
2	Select the option to create a new Employee. - The system will provide a list of active users as reference.
3	Fill in the necessary details for the new Employee, including personal information, contact details, and employment status.
4	Submit the Employee creation process.
5	Check if the form details are valid: - If the details are valid: - Display a success message confirming the creation of the Employee. - Redirect the HR Administrator to the dashboard. - If the details are not valid: - Prompt an error message indicating the incorrect or missing details. - Request the HR Administrator to re-enter the correct information.
6	End.

Table 17 Algorithm: Creating Employee on System by HR Administrator

### 9.4.3 Flowchart for Creating Department on System by HR Administrator

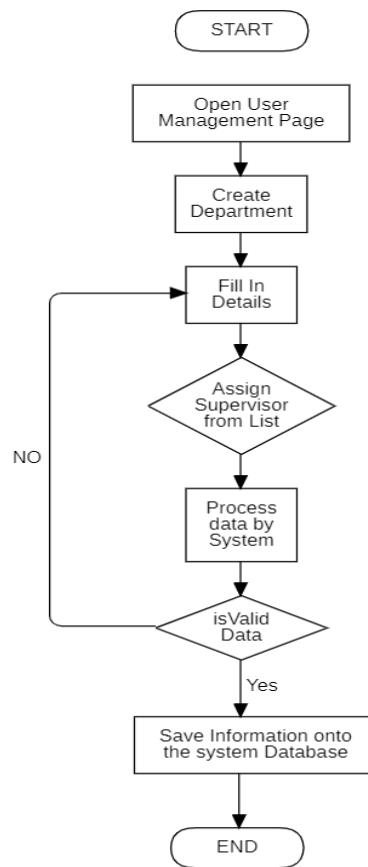


Figure 20: Flowchart Department

#### 9.4.3.1 Algorithm: Creating Department on System by HR Administrator

Step	Description
1	Open the User Management Page.
2	Select the option to create a new Department. - The system will provide a list of users who have been assigned as supervisors.
3	Fill in the necessary details for the new Department, including the name and supervisor(s).
4	Submit the Department creation process.
5	Check if the form details are valid: - If the details are valid: - Display a success message confirming the creation of the Department. - Redirect the HR Administrator to the dashboard. - If the details are not valid: - Prompt an error message indicating the incorrect or missing details. - Request the HR Administrator to re-enter the correct information.
6	End.

Table 18 Algorithm: Creating Department on System by HR Administrator

#### 9.4.4 Flowchart for Creating NewsFeed on System by HR Administrator

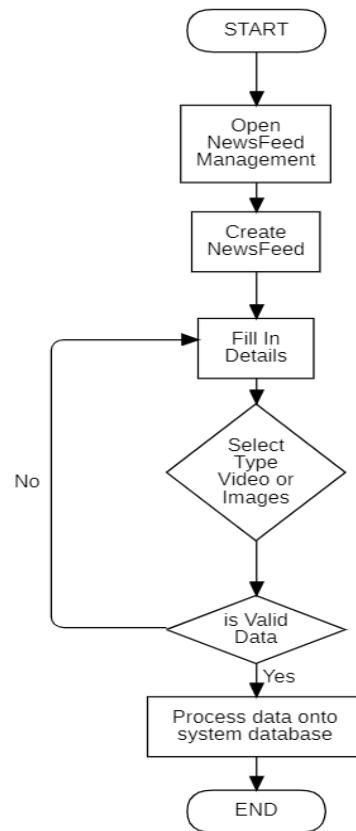


Figure 21: Flowchart Newsfeed

##### 9.4.4.1 Algorithm: Creating NewsFeed on System by HR Administrator

Step	Description
1	Open the NewsFeed Management Page.
2	Create a new NewsFeed by selecting the input type: text, video, or image.
3	Fill in the necessary details for the NewsFeed, including the content, type of media (if applicable), and any other relevant information.
4	Submit the NewsFeed creation process.
5	Check if the form details are valid: <ul style="list-style-type: none"> <li>- If the details are valid:               <ul style="list-style-type: none"> <li>- Display a success message confirming the creation of the NewsFeed.</li> <li>- Redirect the HR Administrator to the dashboard.</li> </ul> </li> <li>- If the details are not valid:               <ul style="list-style-type: none"> <li>- Prompt an error message indicating the incorrect or missing details.</li> <li>- Request the HR Administrator to re-enter the correct information.</li> </ul> </li> </ul>
6	End.

Table 19 Algorithm: Creating NewsFeed on System by HR Administrator

#### 9.4.5 Flowchart for Creating PMS Objectives on System by HR Administrator

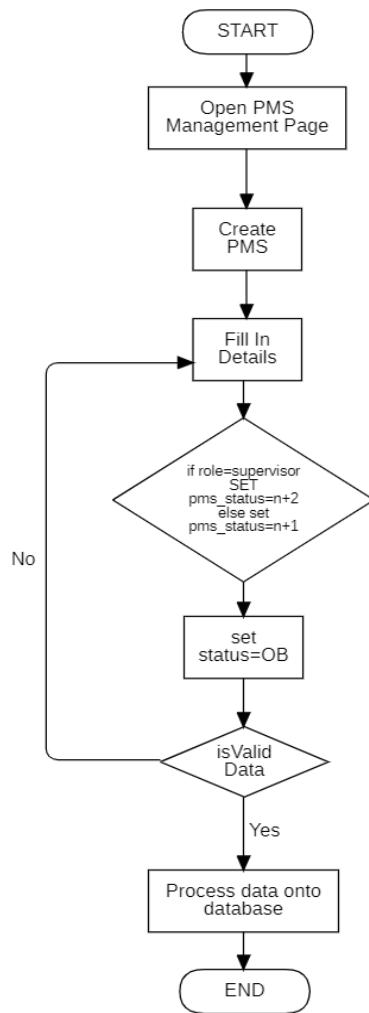


Figure 22: Flowchart PMS

##### 9.4.5.1 Algorithm: PMS Process on System by HR Administrator & Others

Step	Description
1	HR Administrator creates PMS Objectives
2	System performs checks and posts objectives to Database
3	Set management status to "OB" and pms_status to "n+1"
4	Employee receives PMS Objectives notification
5	Employee adds metrics for objectives
6	System performs checks and posts metrics to Database
7	Set management_status to "MU" and pms_status to "n+2"
8	System notifies Supervisor for action
9	Supervisor adds scores for metrics
10	System performs checks and posts scores to Database
11	Set management_status to "SU" and pms_status to "Completed"
12	System automatically calculates PMS Score and PMS Result for Employee
13	End Process

Table 20 Algorithm: PMS Process on System by HR Administrator &amp; Others

#### 9.4.6 Flowchart for Employee Attendance on System

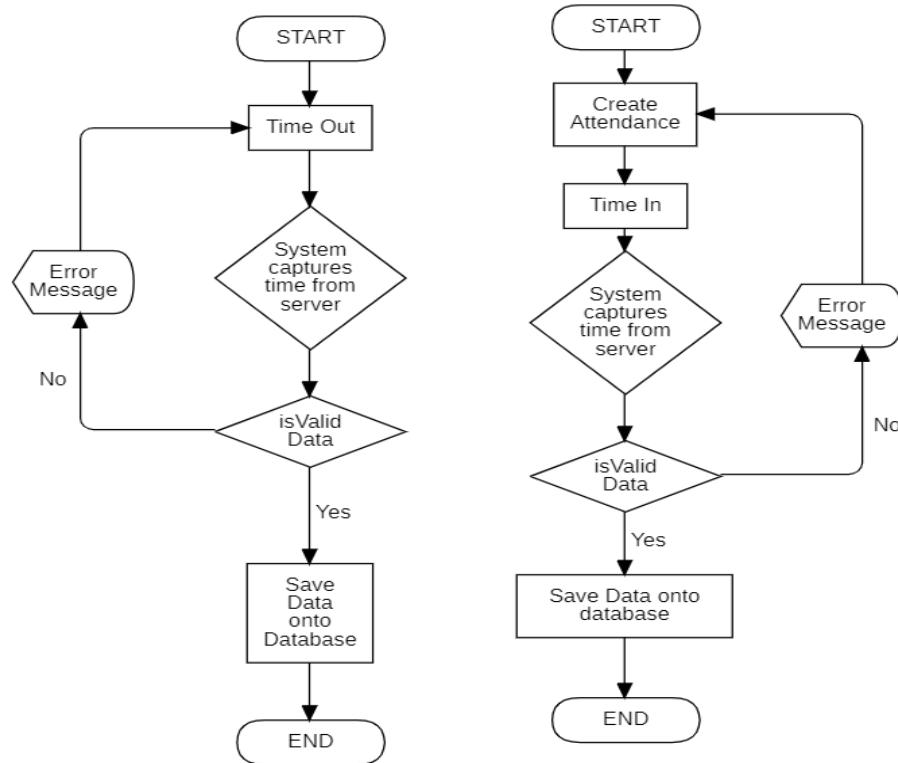


Figure 23: Flowchart Attendance

##### 9.4.6.1 Algorithm: Employee Attendance on System

Step	Description
1	Employee makes a request to Time In
2	System automatically records Time In and posts to Database
3	Display message to Employee confirming Time In
4	Employee makes a request to Time Out
5	System automatically records Time Out and posts to Database
6	Display message to Employee confirming Time Out
7	End Process

Table 21 Algorithm: Employee Attendance on System

#### 9.4.7 Flowchart for Employee Leave on System

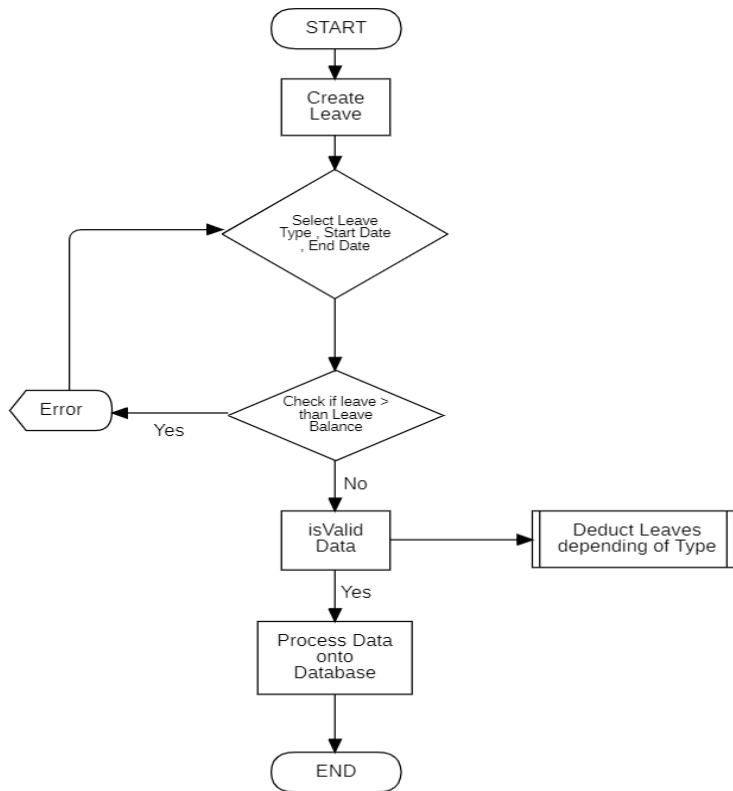


Figure 24: Flowchart Leave

##### 9.4.7.1 Algorithm: Employee Leaves on System

Step	Description
1	Employee applies for leave
2	System performs checks to verify leave balance
3	If leave balance is valid, process request for leave
4	Leave is tagged as Absence Status = "Confirmed"
5	Status is marked as "Pending at N+1"
6	Supervisor or HR Administrator approves leave
7	System automatically deducts the leave from employee leave balance
8	System automatically changes the Absence Status
9	End Process

Table 22 Algorithm: Employee Leaves on System

#### 9.4.8 Flowchart for HR Admin Create Payslip on System

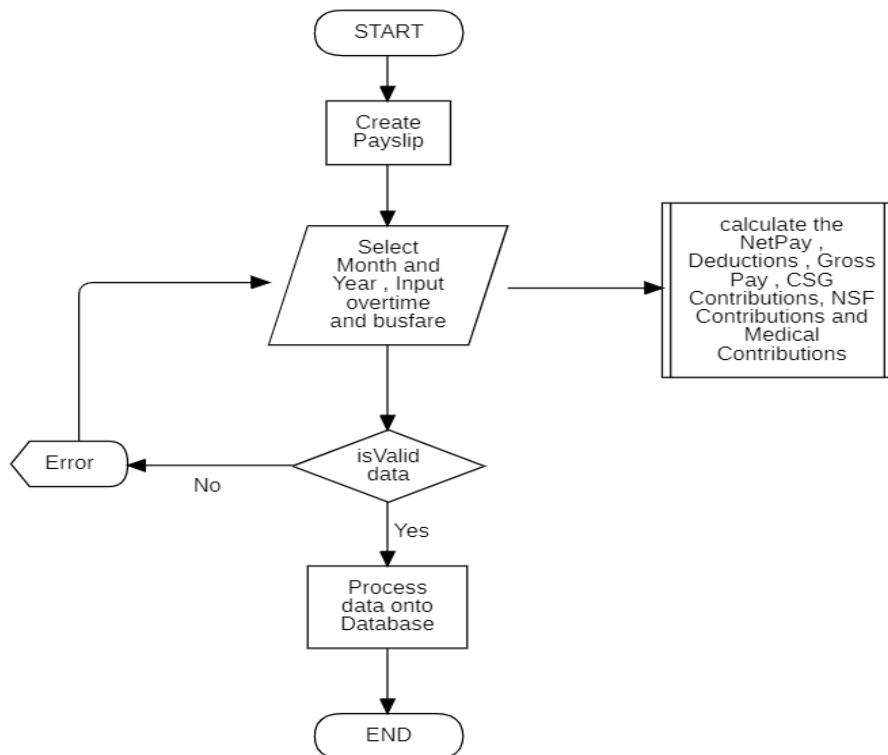


Figure 25: Flowchart Payslip

##### 9.4.8.1 Algorithm: Create Payslip on System

Step	Description
1	HR Administrator makes a request to Create Employee Payslip
2	HR Admin selects Month and Year for the payslip
3	HR Admin inputs Overtime and Bus Fare where applicable
4	System automatically calculates the Earnings, Deductions, and Net pay based on inputs
5	System updates and posts data to the database
6	End Process

Table 23 Algorithm: Create Payslip on System

##### 9.4.8.2 Algorithm: Employee View Payslip on System

Step	Description
1	Employee makes a request to view their Payslip
2	System processes the request and retrieves the relevant payslip data
3	System displays the payslip to the employee
4	System provides printing support for the employee to print the payslip
5	End Process

Table 24 Algorithm: Employee View Payslip on System

#### 9.4.9 Flowchart for Creating Task on System

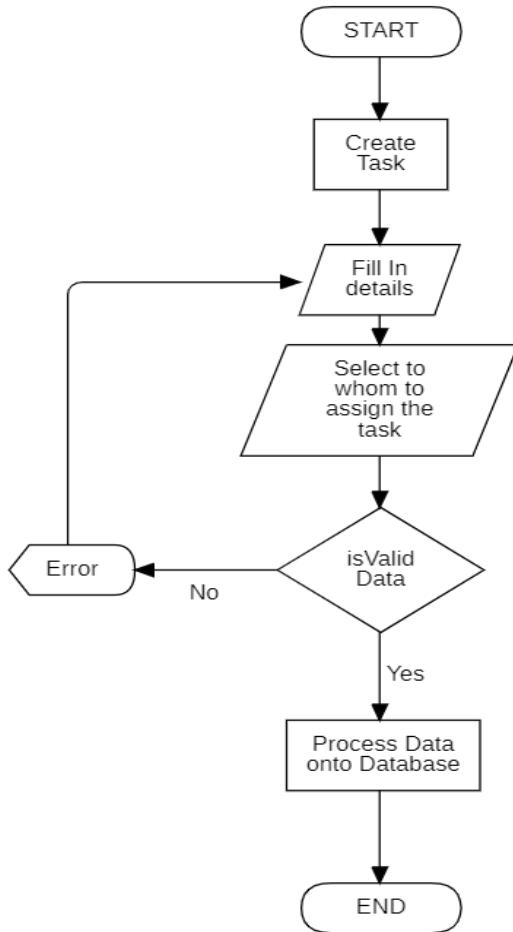


Figure 26: Flowchart Creation of Task

##### 9.4.9.1 Algorithm: Supervisor Create Task on System

Step	Description
1	Supervisor creates a task and assign to employee
2	System registers the request
3	Data is transferred to the database
4	System automatically creates the task and notifies the assigned employee
5	End Process

Table 25 Algorithm: Supervisor Create Task on System

##### 9.4.9.2 Algorithm: Employee Starts Task on System

Step	Description
1	Employee starts the task
2	System updates the task status
3	If the task is completed, the system sends a notification to the supervisor
4	Task status is updated upon employee completing the task with feedback
5	End Process

Table 26 Algorithm: Employee Starts Task on System

#### 9.4.10 Flowchart for Password Change on System

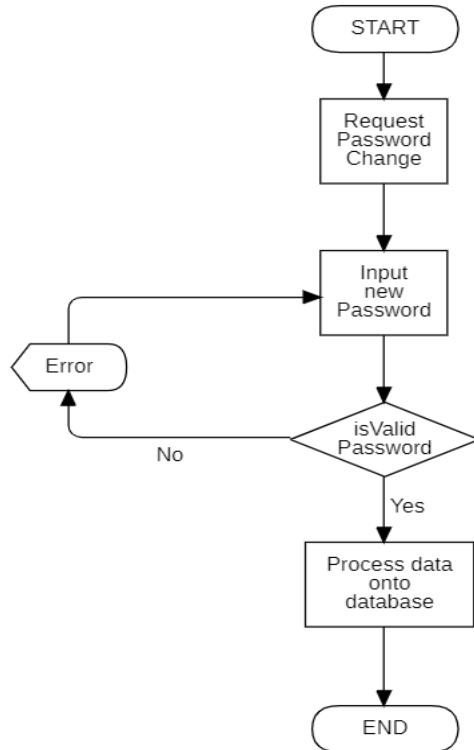


Figure 27: Flowchart Password Change

##### 9.4.10.1 Algorithm: Password Change on System

Step	Description
1	Open Personal Information Page
2	Select "Change Password" Option
3	Enter Current Password
4	Enter New Password
5	Confirm New Password
6	Submit Password Change Request
7	Check if form details are valid
8	If valid, System Updates Password
9	If invalid, Prompt Error Message and Request Correction
10	Display Confirmation Message
11	End Process

Table 27 Algorithm: Password Change on System

## 9.5 SYSTEM ARCHITECTURE

The decision to employ a Monolithic Architecture for the Online Employee Management System (OEMS) involves bundling all components—frontend, backend, and database into a single deployable unit. This approach offers simplicity in development, deployment, and management, making it suitable for smaller applications and teams. However, it presents challenges in scalability, as scaling the entire monolith may be inefficient. Monolithic architectures facilitate faster development and deployment cycles initially, provide flexibility in technology choices, and simplify testing and debugging.

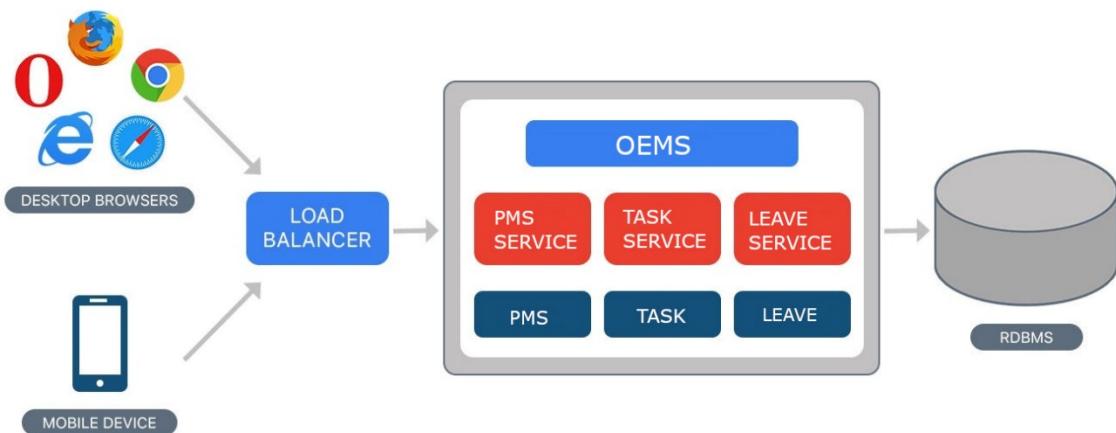


Figure 28: OEMS Monolithic Architecture

### 9.5.1 Breakdown of OEMS Web Application Structure

OEMS (Online Employee Management System) application follows a basic MVC (Model-View-Controller) architecture which helps to separate concerns and maintain a clean and organized codebase. This structure allows for scalability, maintainability, and ease of development as the application grows in complexity.

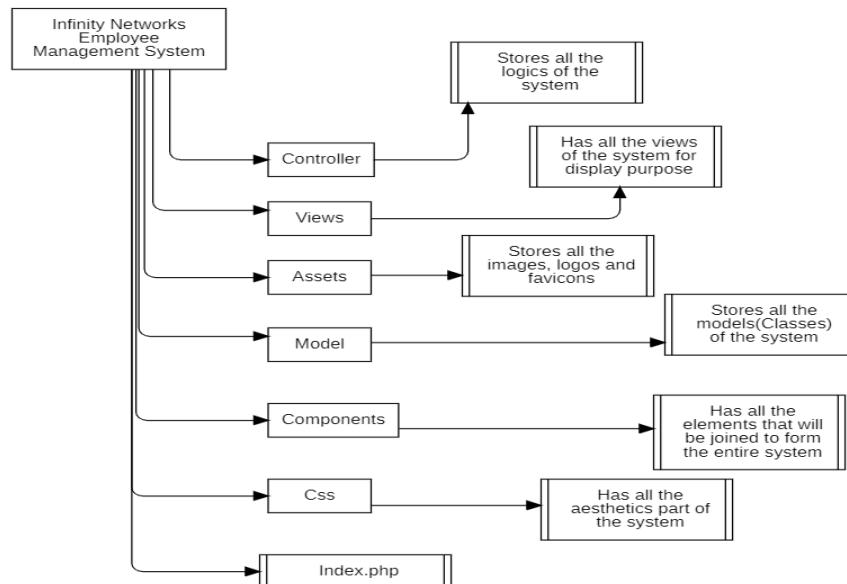


Figure 29: OEMS Web App Structure

### 9.5.2 Breakdown of Administrator configurations on System

Data Structure for the system where Administrator interact with the system and Administrator is the high-level privilege user on the system who has access to all objects being created on the system where modification and removal occurs.

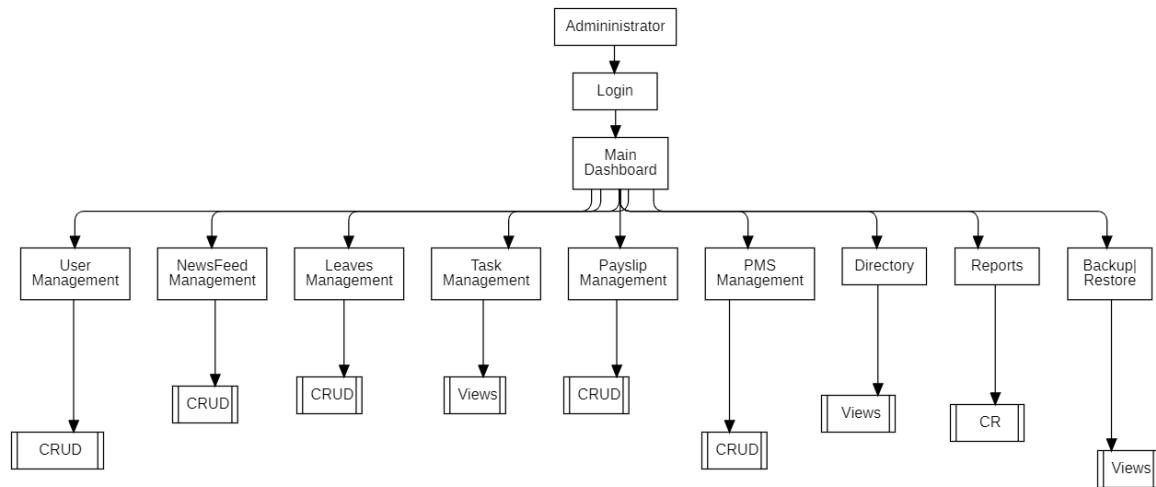


Figure 30: Admin Data Structure of Web App

### 9.5.3 Breakdown of Supervisor configurations on System

Data Architecture (Figure 29) where Supervisor interacts with the system and Supervisor is the Mid-level privilege user on the system who has limited access to objects being created on the system where modifications and creations are allowed.

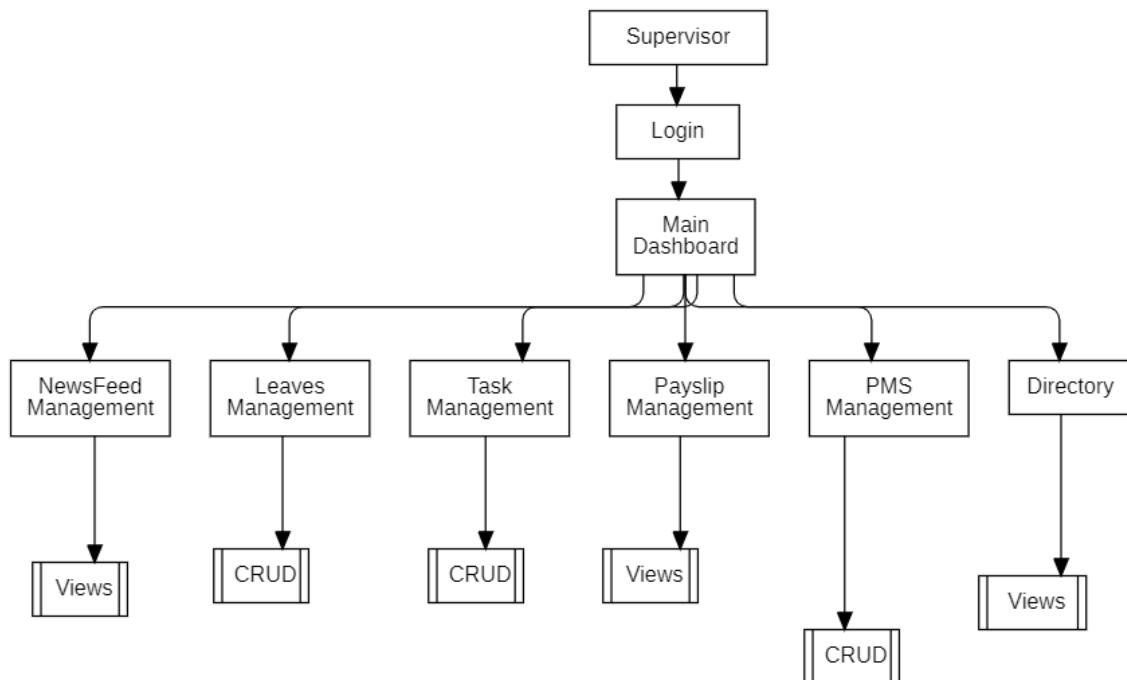


Figure 31: Supervisor Data Structure of Web App

### 9.5.4 Breakdown of Employee configurations on System

System Architecture (Figure 30) where Employee interacts with the system and Employee is the low-level privilege user on the system who has restricted access to objects being created on the system.

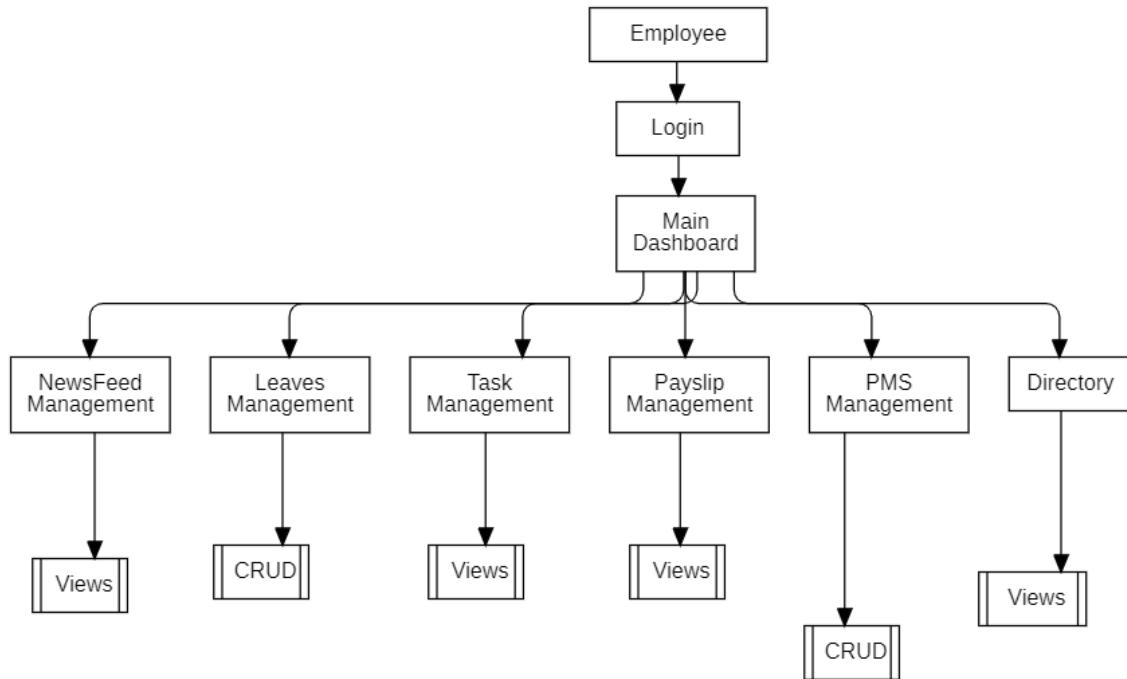


Figure 32: Employee Data Structure of Web App

### 9.5.5 Breakdown of RBAC of System

RBAC ensures that access privileges are granted based on job responsibilities and organizational hierarchy, thereby improving security, simplifying user management, and ensuring compliance with company policies and regulations.

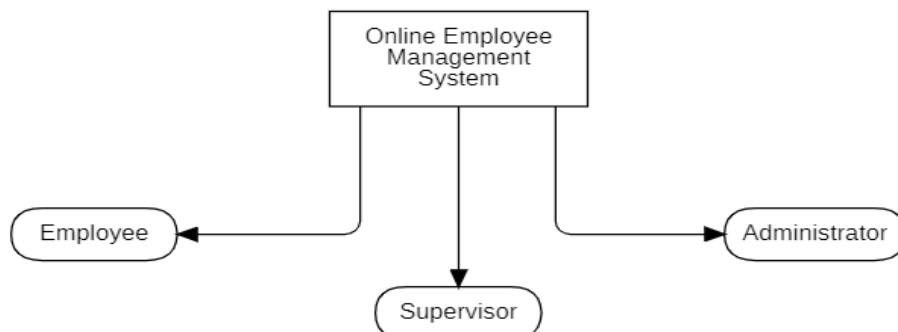


Figure 33: RBAC OEMS

Breakdown of RBAC for the three actors: Administrator, Employee, and Supervisor:

## **1. Administrator:**

### **Roles:**

- HR Administrator: Responsible for managing employee-related tasks, system configuration, manages payroll-related tasks such as generating payslips, calculating salaries, processing payslips and overall system administration.

### **Permissions:**

- Create, update, and delete employee accounts.
- Manage employee roles and permissions.
- Access all features and functionalities of the system.
- Configure system settings, such as leave policies.
- Generate reports and analytics related to employee data, attendance, and performance.

## **2. Employee:**

### **Roles:**

- Regular Employee: An ordinary user who can access and manage their personal information, leave requests, attendance records, and other self-service features.

### **Permissions:**

- View and update personal information, such as contact details, emergency contacts.
- Submit leave requests, view leave balances, and check the status of leave applications.
- Clock in and clock out to record attendance.
- View payslips, tax statements, and other financial information.
- Access company news, announcements, and important updates.

## **3. Supervisor:**

### **Roles:**

- Department Supervisor: Oversees a specific department or team and is responsible for managing tasks, evaluating employee performance, and approving leave requests within their jurisdiction.

### **Permissions:**

- View and manage tasks assigned to employees within their department.
- Approve or reject leave requests from employees under their supervision.
- Conduct performance evaluations, set scores, and provide feedback to employees.
- Access analytics related to their department's performance, attendance, and productivity.

## 9.6 USER INTERFACE DESIGN AND HUMAN COMPUTER INTERACTION

### 9.6.1 Quick Review of User Interface Design

The user-accessible icons, menus, widgets, and labels are located here. It is important that the graphical user interface (GUI) is organized in a recognizable and aesthetically pleasing manner. Any product gains personality and individuality thanks to its designers' sense of aesthetics.

### 9.6.2 Quick Review of Human Computer Interaction

An interdisciplinary branch of research called human-computer interaction (HCI) is devoted to the design of computer technology and the interaction between people (the users) and computers. HCI, which was first focused on computers, has recently broadened to include practically every aspect of information technology design.

### 9.6.3 Breaking down a Html 5 Template onto components for reuse

In the context of OEMS (Online Employee Management System), breaking down the HTML5 template into components helps in organizing the codebase, improving maintainability, and facilitating reusability across different sections of the website or web application.

Here's how it applies to OEMS:

- **Identify Common UI Elements:** Such as headers, navigation menus, forms, tables, modals, employee profiles, attendance trackers, leave management sections, and performance evaluation modules.
- **Create Reusable Components:** Extract each identified UI element into a separate reusable component.

For example:

- Header Component, Sidebar Component: Displays navigation links to different sections of the system, Employee Profile Component, Leave Management Component.

```

controller > admin > dashboard.php > html
1   <?php
2   //Name:RAMLOCHUND Gitendrajeet
3   //Project: OEMS
4   //Scope: Administrator Dashboard
5   session_start();
6
7   ?>
8   <!DOCTYPE html>
9   <html lang="en">
10  <!-- Components Header -->
11  <?php include '../components/header.php'; ?>
12  <!-- End of Header -->
13
14  <body class="dashboard dashboard_2">
15    <div class="full_container">
16      <div class="inner_container">
17        <!-- Sidebar -->
18        <?php include '../components/navbar.php'; ?>
19        <!-- end sidebar -->
20        <!-- right content -->
21        <div id="content">
22          <!-- topbar -->
23          <div class="topbar">
24            <?php include '../components/topbar.php'; ?>
25          </div>
26          <!-- end topbar -->
27          <!-- dashboard inner -->
28          <?php include '../components/warning.php'; ?>
29
30          <!-- footer -->
31          <?php include '../components/footer.php'; ?>
32
33    </body>
34  </html>

```

Figure 34: HTML 5 Template Components

## 9.7 SECURITY AND ERROR HANDLING

### 9.7.1 Role Based Access Control (RBAC)

Role-Based Access Control (RBAC) in OEMS is a fundamental approach to managing user permissions and ensuring secure access to system resources. RBAC involves assigning roles to users and defining permissions based on those roles.

RBAC has been applied in OEMS using:

- Define User Roles
- Authorization Checks: function to check isValid()
- Session Management: Save as \$\_SESSION['email'] ;
- Automatic Logout: Redirects to 401\_Unauthorized page

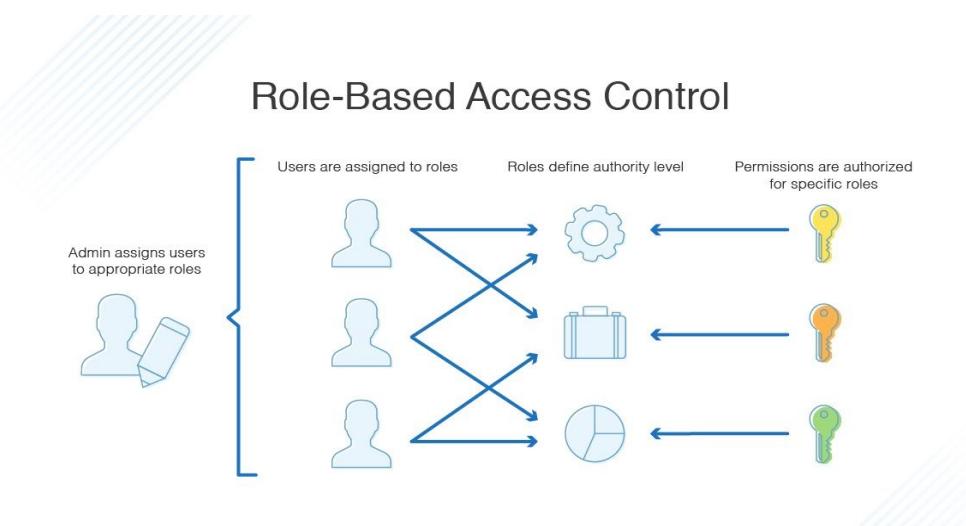


Figure 35: RBAC

### 9.7.2 Error Handling

Using a User-friendly interface to display visually appealing pop-up messages with customizable titles, text, and icons. This makes error messages more understandable and less intimidating for users compared to error codes or technical messages. By presenting error messages in a more intuitive format, users can quickly understand the nature of the error and take appropriate actions to resolve it. This can lead to a more positive user experience and reduce frustration.

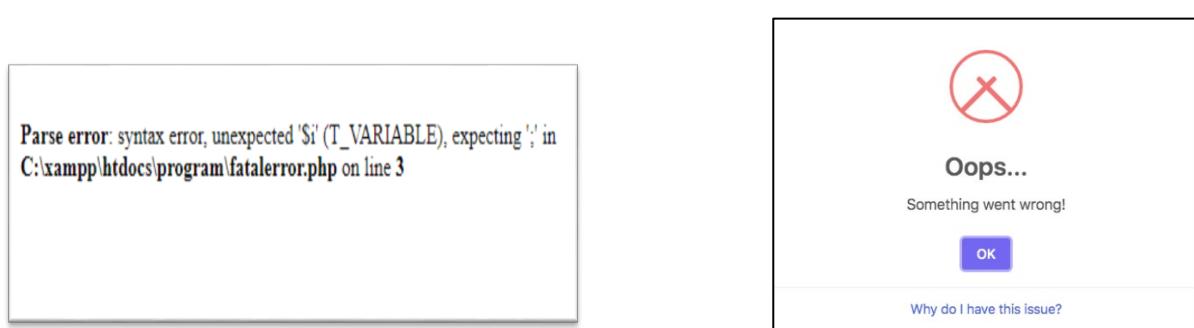


Figure 36: User Friendly Error Handling

### 9.7.3 Enhancing User Experience with SQL Database

Through the implementation of a more structured and descriptive format for IDs in the OEMS database, I aim to enhance the overall user experience for administrators, employees, and supervisors. These refined IDs offer clearer and contextually relevant identifiers for various system records, such as employees, departments, tasks, and more.

This improvement not only enhances the readability and usability of the system's data but also fosters more efficient and intuitive interaction with the OEMS interface. Users can swiftly identify and navigate through different records, ultimately boosting productivity and satisfaction with the system.

	▼	id	publicationId	Author_ID	Name	Detail	Genre	Price	Quantity	Available	Rent	
Edit	Copy	Delete	1	1	1	FOP	Programming	it	500	10	20	0
Edit	Copy	Delete	2	2	2	DSA	Programming	it	600	5	20	0
Edit	Copy	Delete	3	3	3	LA	Linear Algebra	novel	500	15	20	0
Edit	Copy	Delete	4	1	4	Probability Stats		novel	1000	20	20	0

Figure 37:Database with Plain Id

→	▼	user_id	email	password	role	name	surname	isActive	
Edit	Copy	Delete	USR001	admin@test.com	Admin123	Administrator	Infinity	Administrator	1
Edit	Copy	Delete	USR002	test2@test.com	Test*12345	Supervisor	Mason	Mount	1
Edit	Copy	Delete	USR003	test30@test.com	Test*123	Employee	Test	Test	1
Edit	Copy	Delete	USR004	test31@test.com	Test*123	Employee	Test	Again	1
Edit	Copy	Delete	USR005	test32@test.com	Test*123	Supervisor	Elon	Musk	0
Edit	Copy	Delete	USR006	test10@test.com	Test*123	Employee	David	Gueta	1

Figure 38:Database with Concat User\_id

By using Concat function onto the database it provides the following:

- Readability
- Consistency
- Meaningful
- Sorting
- Offers a clearer picture during debugging processes when identifying software errors or bugs.

## 9.8 WIREFRAMES

### 9.8.1 Wireframe The Index Page

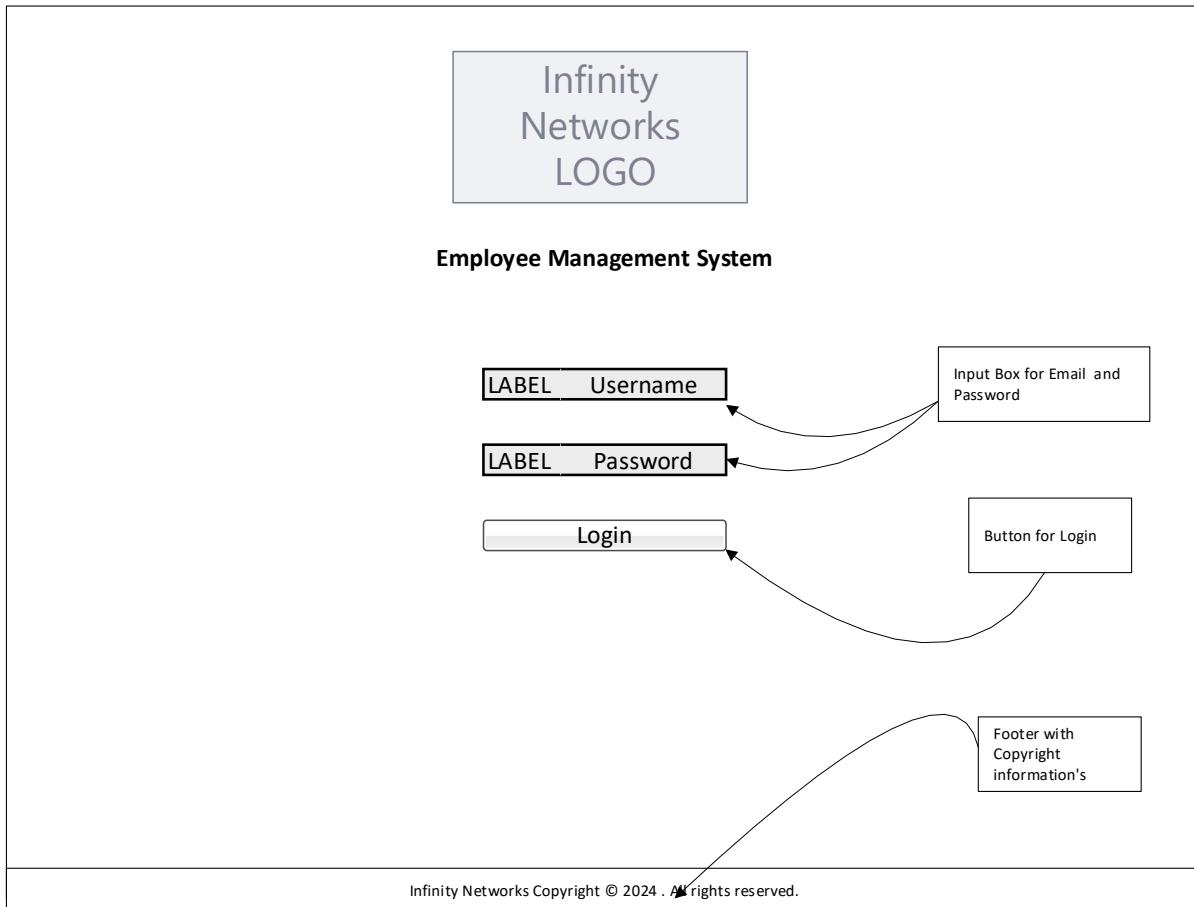


Figure 39: Wireframe for Login Page

#### 9.8.1.1 GUI for Index Page

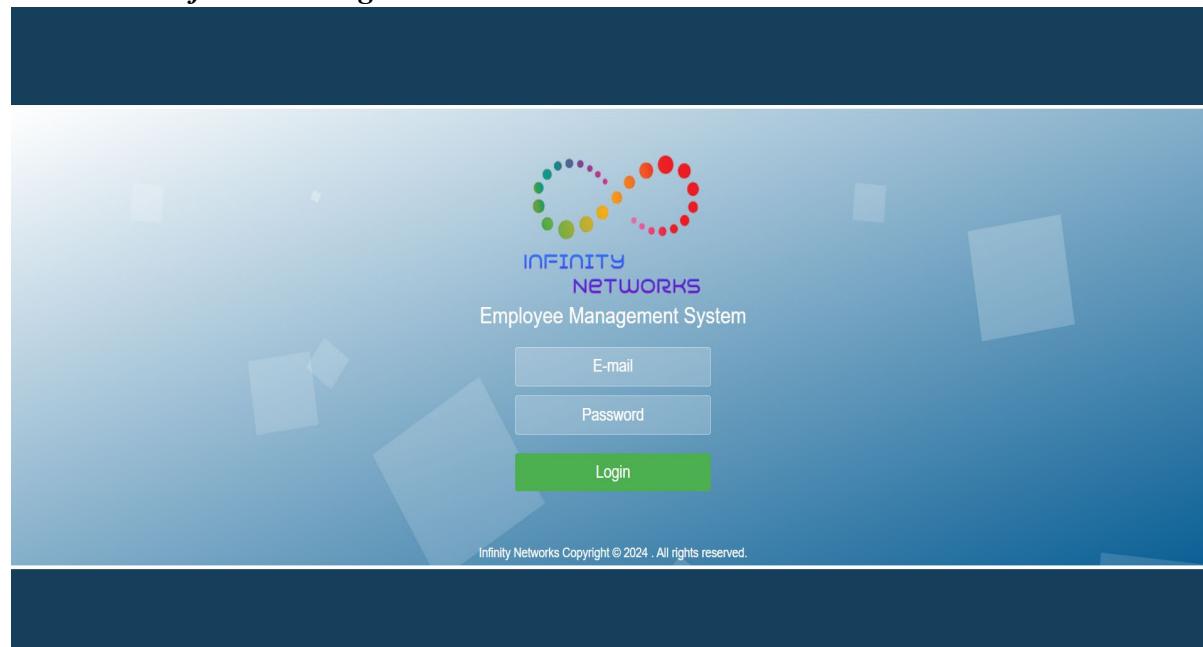
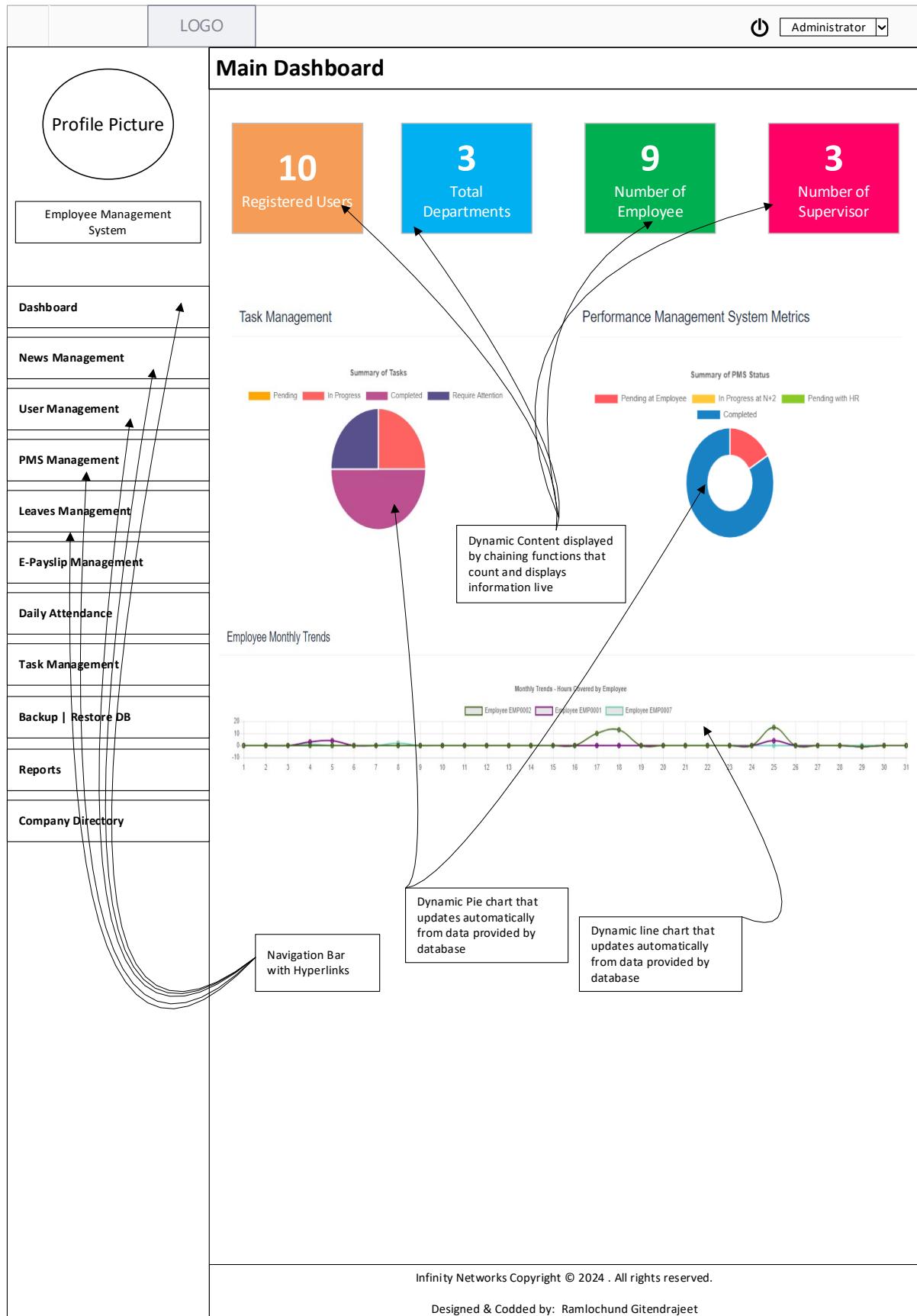


Figure 40: GUI Login Page

## 9.9 WIREFRAME CASE: ADMINISTRATOR

### 9.9.1 Wireframe: Admin Main Dashboard



### 9.9.1.1 GUI Admin Main Dashboard

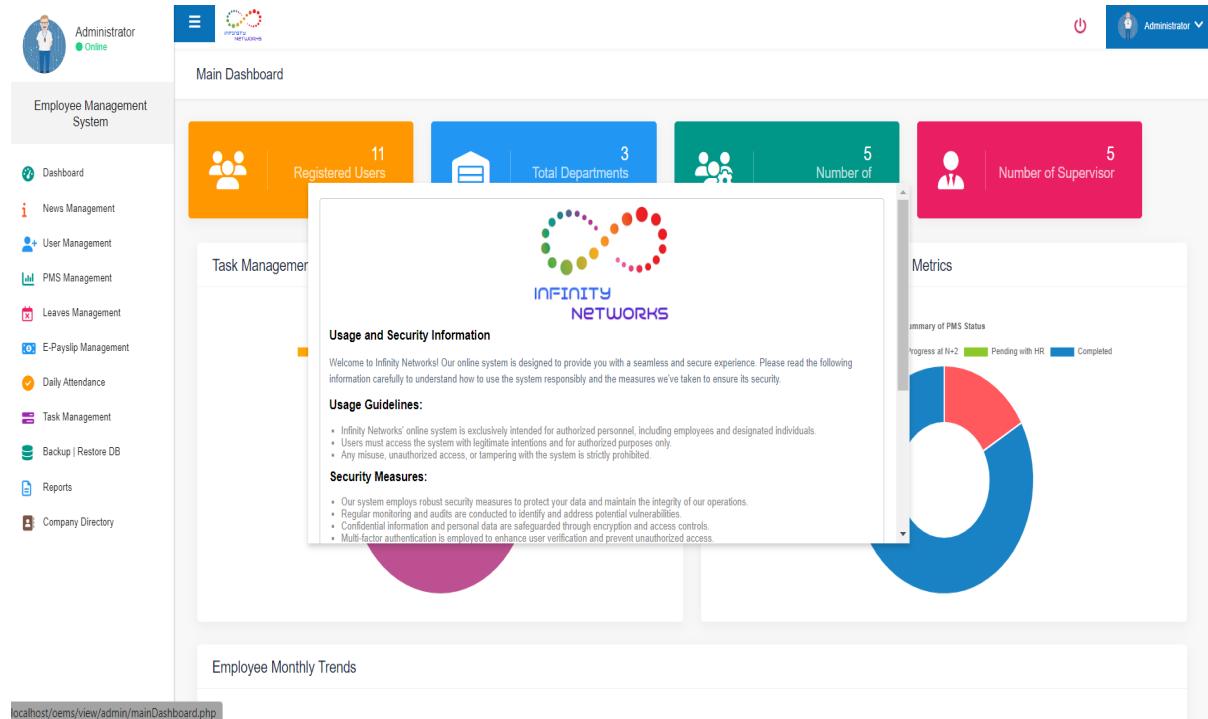


Figure 41: Main Dashboard Security Warning

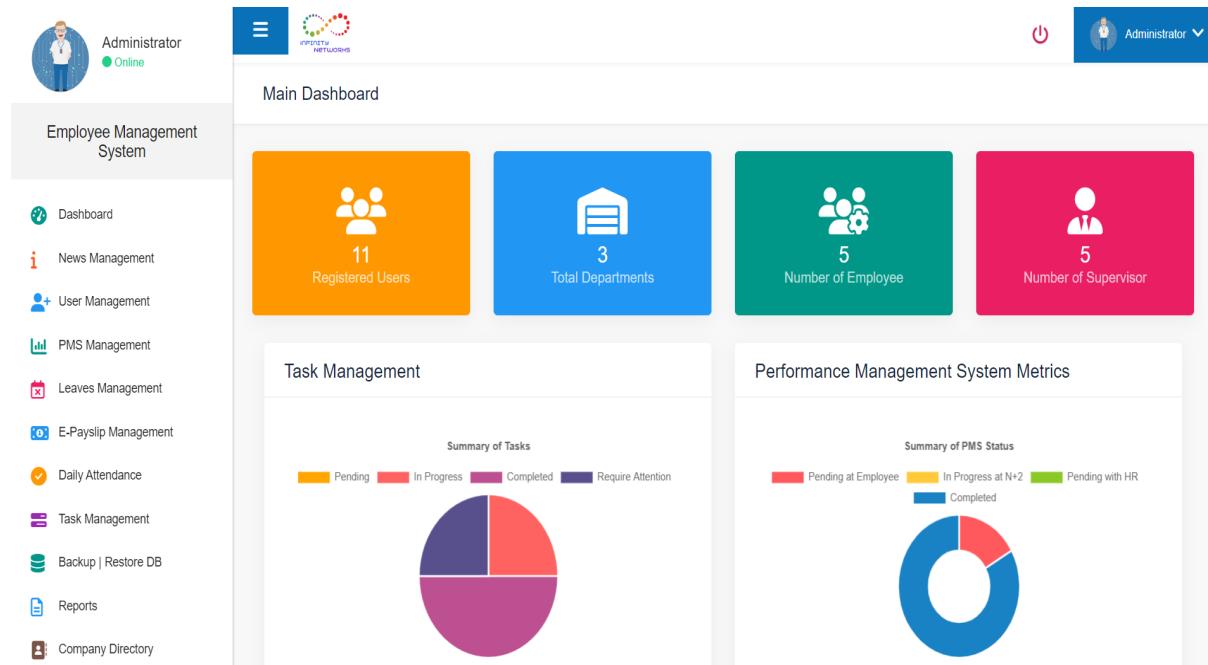


Figure 42: GUI Main Dashboard

The graphics representations have been used from opensource, programmed a such way that the content is dynamically updated when an event is occurred on within the employee management system.

Each time the page is click or refreshed by the user a popup message is displayed as a to warn against unauthorized access to the system.

### 9.9.2 Wireframe News Management

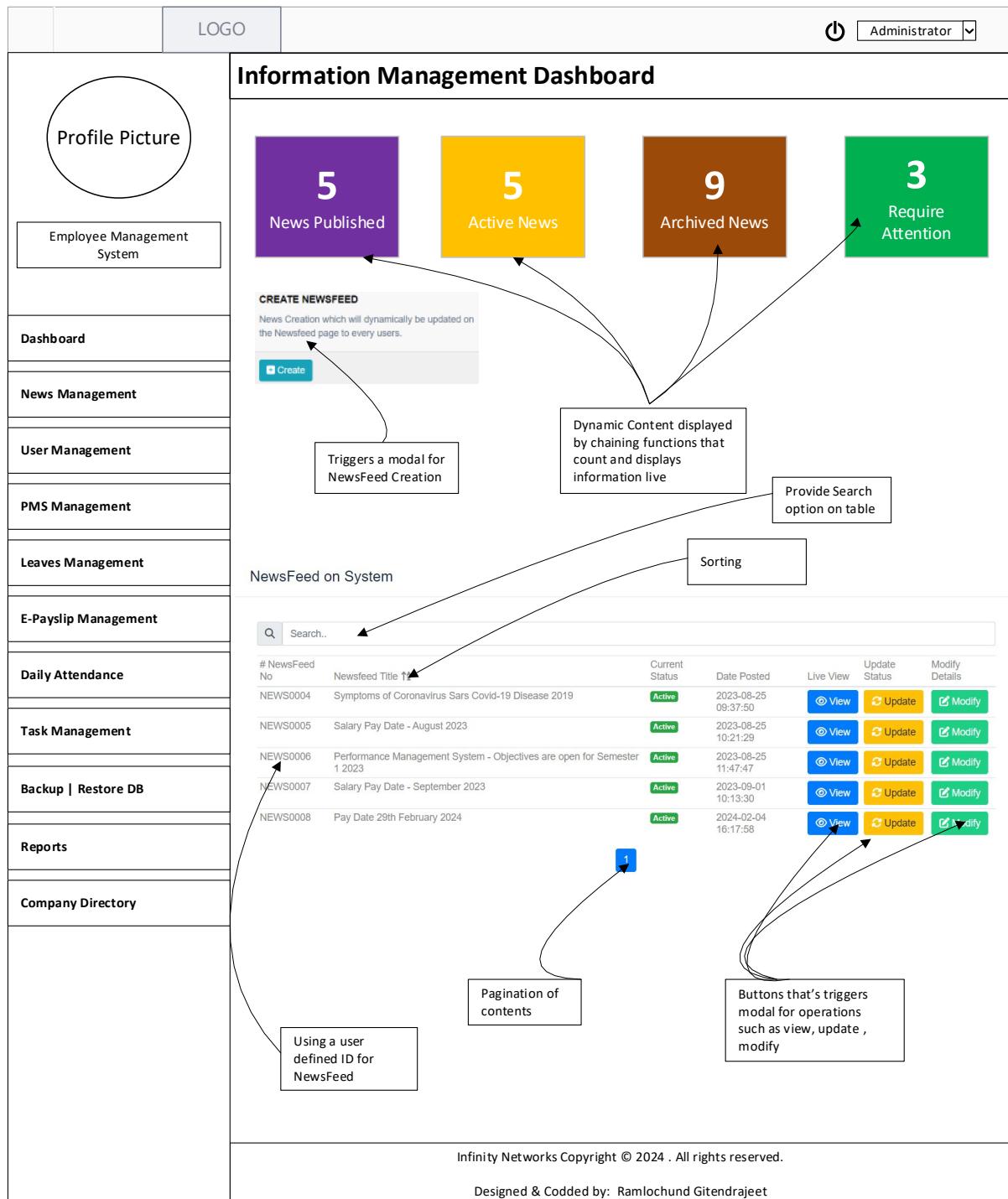


Figure 43:Wireframe News Management

The user management component has been meticulously designed to minimize the need for extensive navigation across multiple pages to access functionalities. Leveraging modals has been instrumental in enabling swift and convenient data processing within the system.

### 9.9.2.1 GUI News Management

The screenshot shows the Employee Management System (EMS) interface. On the left is a sidebar with various management options: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The user is logged in as an Administrator.

The main area features a dashboard summary with four cards:

- News Published:** 5 items
- Active News:** 5 items
- Archived News:** 0 items
- Require Attention:** 0 items

A modal window titled "CREATE NEWSFEED" is open, containing a form with fields for "Newsfeed Title" (set to "Symptoms of Coronavirus Sars Covid-19 Disease 2019") and "Content" (describing COVID-19 symptoms). Below the content is a note: "News Creation which will dynamically be updated on the Newsfeed page to every users." A "Create" button is at the bottom of the modal.

The "NewsFeed on System" section displays a table of news items:

# NewsFeed No	Newsfeed Title	Current Status	Date Posted	Live View	Update Status	Modify Details
NEWS0004	Symptoms of Coronavirus Sars Covid-19 Disease 2019	Active	2023-08-25 09:37:50	<a href="#">View</a>	<a href="#">Update</a>	<a href="#">Modify</a>
NEWS0005	Salary Pay Date - August 2023	Active	2023-08-25 10:21:29	<a href="#">View</a>	<a href="#">Update</a>	<a href="#">Modify</a>
NEWS0006	Performance Management System - Objectives are open for Semester 1 2023	Active	2023-08-25 11:47:47	<a href="#">View</a>	<a href="#">Update</a>	<a href="#">Modify</a>
NEWS0007	Salary Pay Date - September 2023	Active	2023-09-01 10:13:30	<a href="#">View</a>	<a href="#">Update</a>	<a href="#">Modify</a>
NEWS0008	Pay Date 29th February 2024	Active	2024-02-04 16:17:58	<a href="#">View</a>	<a href="#">Update</a>	<a href="#">Modify</a>

Figure 44: GUI News Management

This screenshot is identical to Figure 44, showing the EMS interface with the "CREATE NEWSFEED" modal open. The modal contains the same fields: "Title" (set to "Symptoms of Coronavirus Sars Covid-19 Disease 2019") and "Content" (describing COVID-19 symptoms). At the bottom of the modal are "Save Changes" and "Close" buttons.

Figure 45: Usage of Modals

### 9.9.3 Wireframe Creating a NewsFeed

The wireframe illustrates the 'Information Management Dashboard' interface. On the left is a vertical sidebar menu with items like Profile Picture, Employee Management System, Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The main area is titled 'News Creation' and contains fields for Title (News Title), Content (News Content), Image (Choose File, No file chosen, Image Preview), Video Link (Video Link), and Is Active (Yes). Buttons for Submit and Cancel are at the bottom. Callout boxes explain the functions of the 'Image' field, 'Is Active' dropdown, and the buttons.

**Information Management Dashboard**

**News Creation**

**Form Fields:**

- Title: News Title
- Content: News Content
- Image: Choose File (No file chosen), Image Preview
- Video Link: Video Link
- Is Active: Yes

**Buttons:**

- Submit
- Cancel

**Annotations:**

- Image field: Input type text and textbox
- Is Active dropdown: Select option for Active Status
- Cancel button: Cancel Button redirects to dashboard
- Submit button: Submit Button of Form

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Designed & Codded by: Ramlochund Gitendrajeet

The form offers options to post newsfeed content, including videos or images, along with accompanying news content. By default, the news is set to active, with the flexibility to adjust this setting for future news postings. Upon submission of the form, the data is automatically updated and displayed to all users as part of the NewsFeed.

### 9.9.3.1 GUI News Creation

The screenshot shows the 'Create News' form within the Employee Management System. The form has fields for 'Title' (containing 'News Title'), 'Content' (containing 'News Content'), 'Image' (with a 'Choose File' button), 'Video Link' (containing 'Video Link'), and 'Is Active' (set to 'Yes'). At the bottom are 'Submit' and 'Cancel' buttons. The background sidebar lists various management modules like Dashboard, News Management, User Management, etc.

Figure 46: News Creation Form

### 9.9.3.2 GUI Popup Message for successful News Creation

The screenshot shows a 'Success' message popup in the foreground, indicating that news was created successfully. The background shows the same 'Create News' form as Figure 46, with the 'Is Active' field set to 'Yes'. The background sidebar is identical to Figure 46.

Figure 47: Success Message popup

Upon successful validation and verification of each news creation, the system displays a popup message to inform the user that the process has been successful.

### 9.9.4 Wireframe: User Management

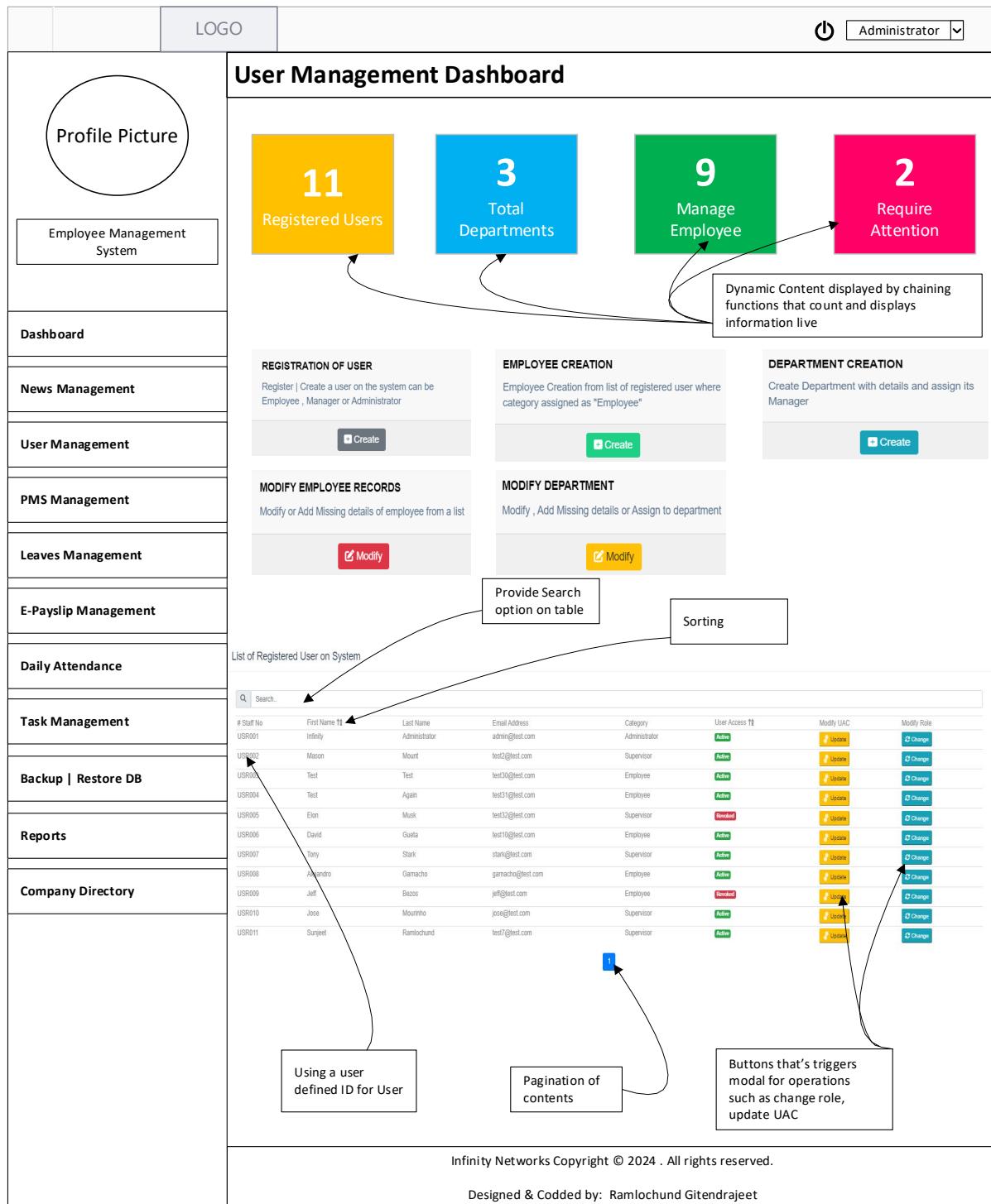


Figure 48: Wireframe User Management

#### 9.9.4.1 GUI User Management

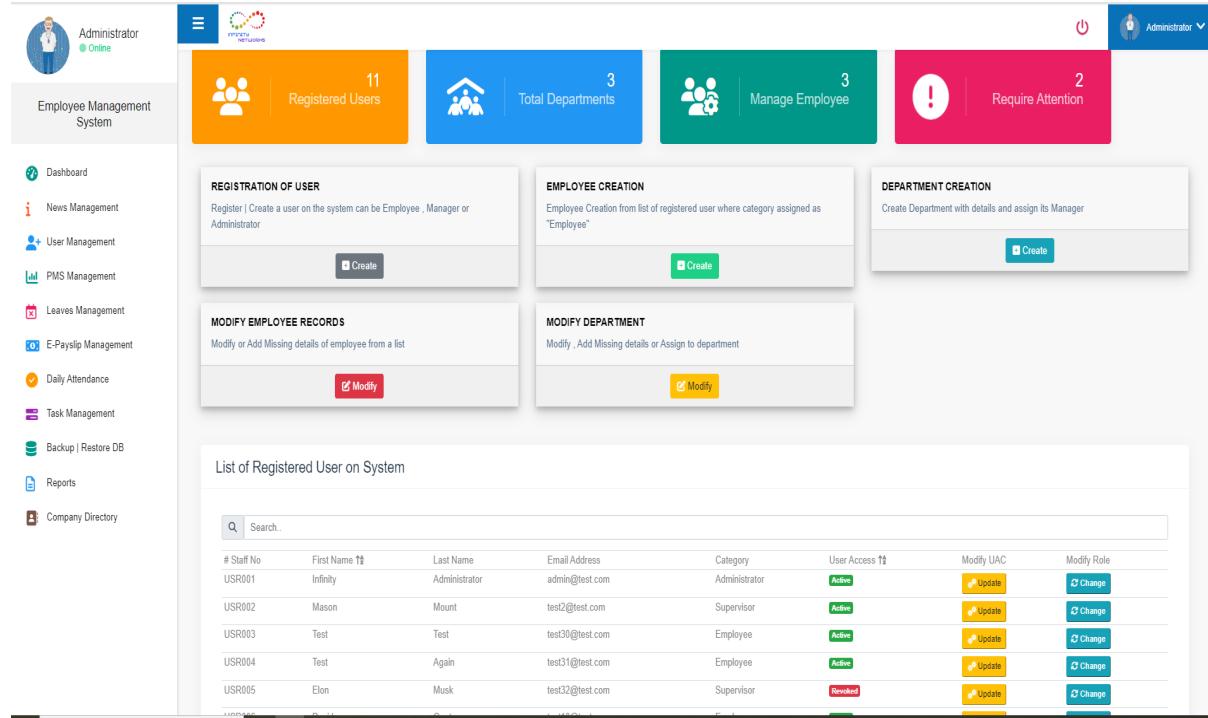
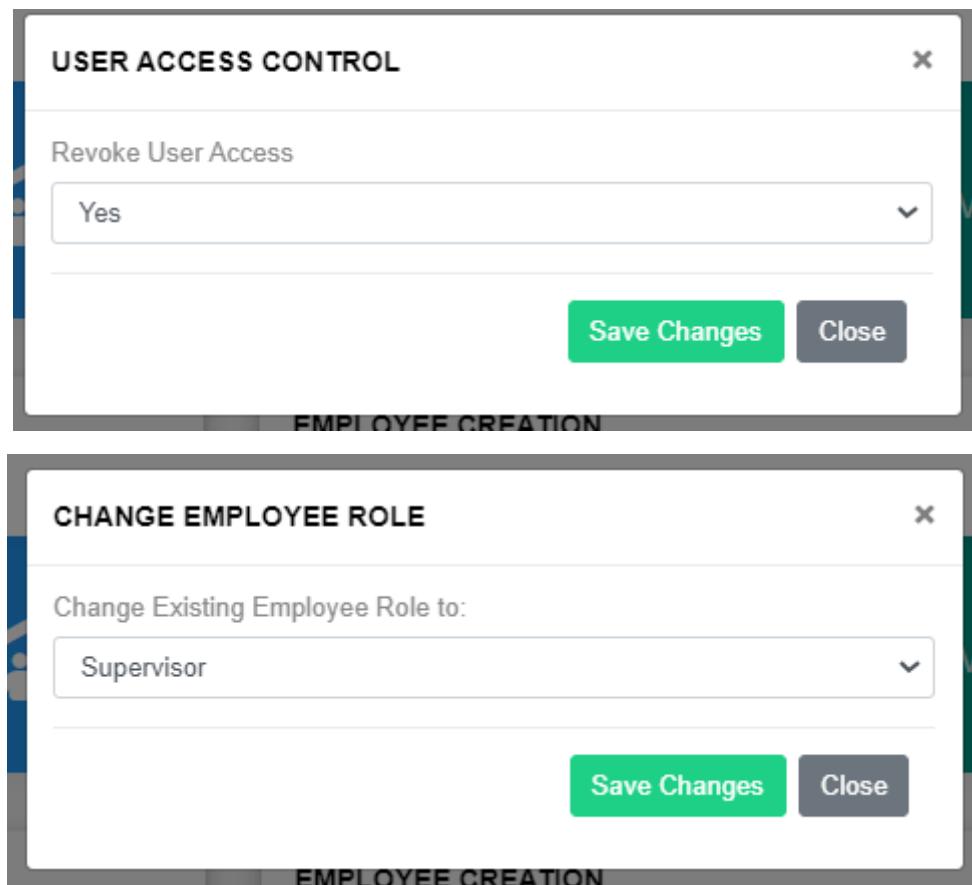


Figure 49: GUI User Management

Within the user management dashboard page, the administrator possesses the authority to revoke user access and modify roles, such as changing a user's designation from employee to supervisor.



### 9.9.5 Wireframe: Registration of User on system

**Create user on System**

User Creation onto Infinity Networks System

Email address  
Email

Password  
Password

Category  
Administrator

Name  
Eg. Erling

Surname  
Eg. Halaand

**Submit**   **Cancel**

Cancel Button redirects to dashboard

Submit Button of Form

Input type text for Email where email is unique and Password

Input select options: Administrator, Employee, Supervisor

Input text for Name and Surname

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Designed & Codded by: Ramlochund Gitendrajeet

Figure 50: Wireframe User Creation

Input options for Category: Administrator, Employee, Supervisor

Email must be unique, and passwords must adhere to a specified pattern.

Upon successful submission of the form, a message is displayed on the screen to inform the user about the successful operation.

### 9.9.5.1 GUI User Creation

Create user on System

User Creation onto Infinity Networks System

Email address  
Email

Password  
Password

Category  
Administrator

Name  
Eg. Erling

Surname  
Eg. Halaand

Submit Cancel

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Figure 51: GUI User Creation

Infinity Networks ALERT: User already exist on System

Figure 52: Error Message with Alert

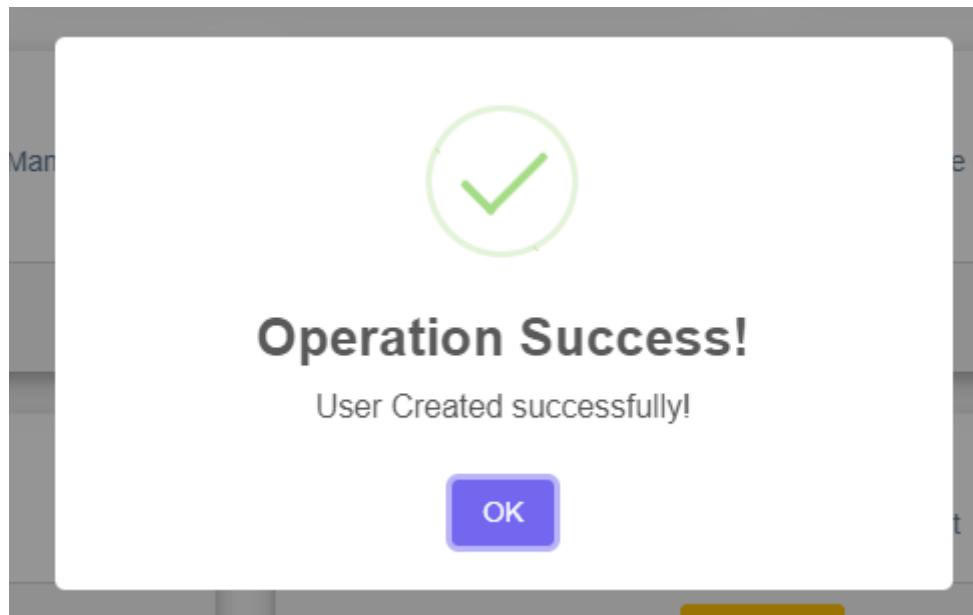


Figure 53: Successful message for User Creation

### 9.9.6 Wireframe: Creating Employee from user list

The wireframe illustrates the 'Create Employee on System' interface. On the left is a vertical sidebar menu with the following items:

- Profile Picture
- Employee Management System
- Dashboard
- News Management
- User Management
- PMS Management
- Leaves Management
- E-Payslip Management
- Daily Attendance
- Task Management
- Backup | Restore DB
- Reports
- Company Directory

The main content area is titled 'Create Employee on System' and contains the 'Employee Registration Form'. It includes the following fields:

- Select Employee From Dropdown List (with 'Test Again' button)
- Profile Picture (with 'Choose File' and 'Image Preview' buttons; annotated with 'Select options are populated from query with database')
- Position Occupy (with example 'Eg. Software Engineer')
- Mauritian NIC(MNIC) (with example 'Mauritian National Identity Card Number Eg. H070890040101A')
- Mobile Number (with example 'Eg. 57770000')
- Phone Number (with example 'Eg. 2030000')
- Residential Address (with example 'Eg. 4, Wall Street')
- Emergency Contact Person (with example 'Eg. Erling Halaand')
- Emergency Contact Number (with example 'Eg. 2030000')
- Date Joined Company (with date format 'dd/mm/yyyy')
- Highest Educational qualification (with example 'Eg. Degree')
- Basic Salary (with input field)
- Assign to Department (with dropdown menu labeled 'Business'; annotated with 'Select option populated from query to database and to assign to department')
- Submit, Reset, and Cancel buttons
- Clear Form button
- Submit Button of Form button (annotated with 'Input text for Name and Surname')

At the bottom of the form area, there are copyright and design information:

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- Designed & Coded by: Ramlochund Gitendrajeet

The employee selection options are dynamically populated by querying the database to select only users tagged as employees who have not been registered yet. Once a user is registered as an employee, the list is automatically updated to exclude users who have already been registered.

The "Assign to Department" selection options are populated by querying the database to select all created departments.

### 9.9.6.1 GUI Creating Employee from user list

The screenshot shows the 'Employee Management System' interface. On the left, a sidebar lists various management modules: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup / Restore DB, Reports, and Company Directory. The main area is titled 'Create Employee on System' and contains a sub-section titled 'Employee Registration Form'. It features a file input field for 'Profile Picture' with options to 'Choose File' or 'No file chosen', and a preview button. Other fields include 'Position Occupy' (Eg. Software Engineer), 'Mauritian NIC(MNIC)' (Mauritian National Identity Card Number Eg. H070890040101A), 'Mobile Number' (Eg. 57770000), 'Phone Number' (Eg. 2030000), 'Residential Address' (Eg. 4, Wall Street), 'Emergency Contact Person' (Eg. Erling Haland), 'Emergency Contact Number' (Eg. 2030000), and 'Date Joined Company' (dd/mm/yyyy).

Figure 54: GUI Employee Creation

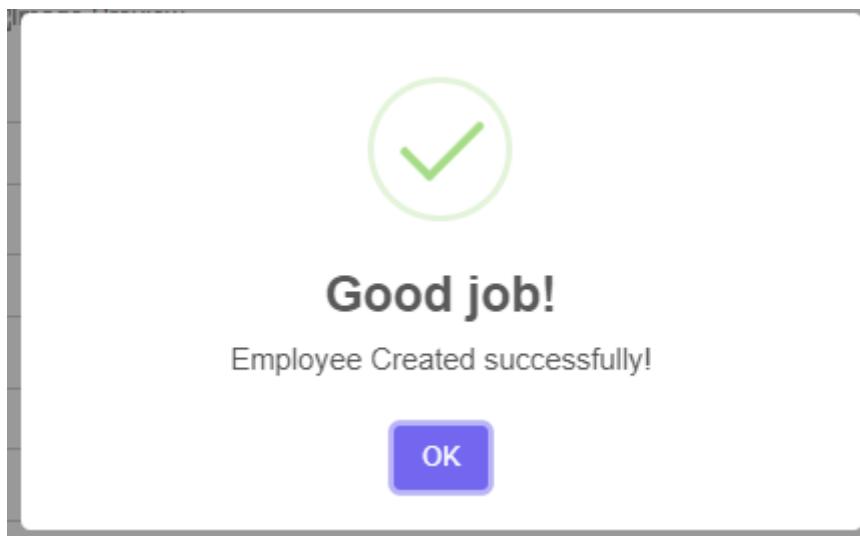


Figure 55: GUI Message for Employee Creation

### 9.9.7 Wireframe: Creating a department on system

The wireframe illustrates the 'Create Department on System' interface. On the left, a sidebar lists management modules: Profile Picture, Employee Management System, Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The main panel has a title 'Create Department on System' and a sub-section 'Department Creation onto Infinity Networks System'. It contains fields for 'Department Name' (example: Software Development), 'Department Description' (example: Regroup all software developers, engineers, mobile developers and QA Specialists), and 'Select Supervisor to Assign from Dropdown List' (example: Mason Mount). A 'Submit' button and a 'Cancel' button are at the bottom. Callouts provide additional details: 'Select options are populated from query with database where only employee who is tagged as Supervisor are selected' points to the supervisor dropdown; 'Input type text for Department Name and Description' points to the respective text input fields; and 'Cancel will redirect to dashboard, aborting all operations' points to the cancel button.

Figure 56: Wireframe Department Creation

The selection options for assigning supervisor to department are populated from a query to the database, selecting only employees who are tagged as supervisors.

### 9.9.7.1 GUI Department Creation

The screenshot shows the 'Employee Management System' interface. On the left, a sidebar lists various management modules: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The 'Administrator' status is shown as 'Online'. The main content area is titled 'Create Department on System' and contains a sub-section titled 'Department Creation onto Infinity Networks System'. It has input fields for 'Department Name' (with placeholder 'Eg. Software Development') and 'Department Description' (with placeholder 'Eg. Regroup all software developers, engineers, mobile developers and QA Specialists'). A dropdown menu for 'Select Supervisor to Assign from Dropdown List' shows 'Mason Mount'. At the bottom are 'Submit' and 'Cancel' buttons. The footer of the page includes copyright information: 'Infinity Networks Copyright © 2024. All rights reserved.' and 'Designed & Codded by: Ramlochund Gitendrajeet'.

Figure 57: GUI Department Creation

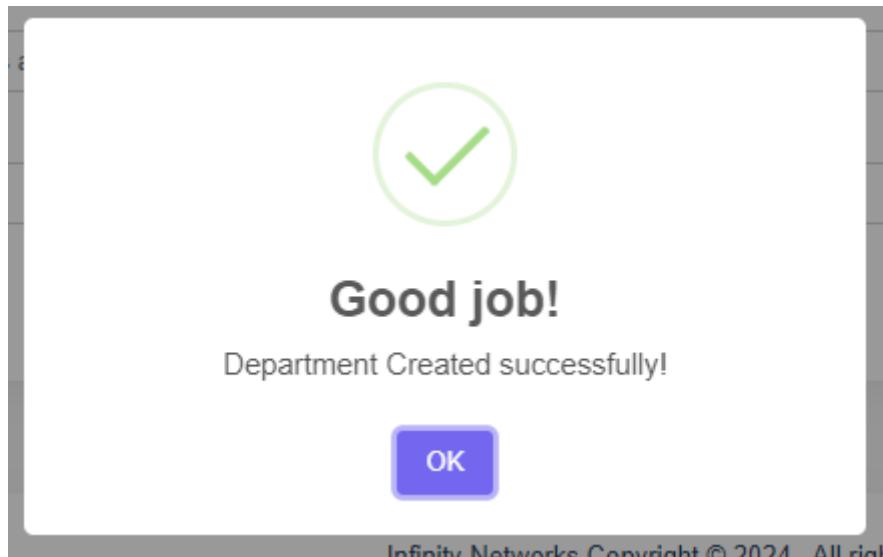


Figure 58: GUI Message for Department Creation

### 9.9.8 Wireframe: Modifying Employee Details

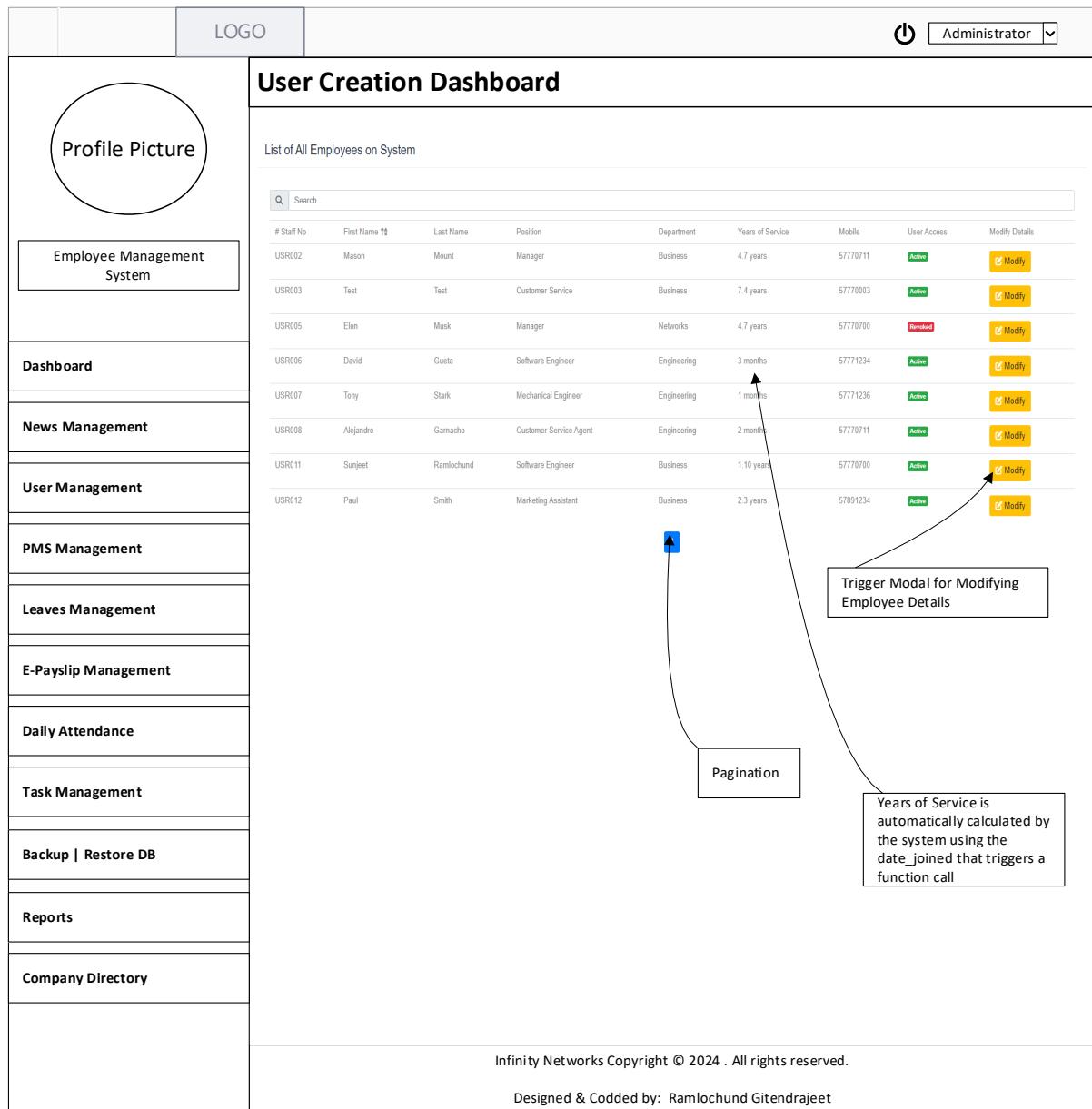


Figure 59: Wireframe Modifying Employee Details

The system automatically calculates the years of service of an employee based on the "date\_joined" variable. This variable is passed as a parameter to a specific function dedicated to computing the employee's years of service. The function then processes the date information and returns the calculated number of years of service completed by the employee.

This automated process helps to accurately determine and display the tenure of each employee without manual intervention, providing users with valuable information about employee longevity and loyalty to the organization.

"Revoked" status indicates that an employee's user access has been restricted or revoked, meaning they no longer have active access to the system.

"Active" status denotes that an employee's user access is currently active and operational, allowing them to utilize the system's functionalities as intended.

### 9.9.8.1 GUI Modifying Employee Details

The screenshot shows a web-based application interface titled "User Creation Dashboard". At the top right, there is a user profile icon for "Administrator" with a green "Online" status. Below the title, a search bar contains the placeholder "Search...". A table lists twelve employees with the following columns: # Staff No, First Name, Last Name, Position, Department, Years of Service, Mobile, User Access, and Modify Details. The "Modify Details" column contains buttons for each row. The data in the table is as follows:

# Staff No	First Name	Last Name	Position	Department	Years of Service	Mobile	User Access	Modify Details
USR002	Mason	Mount	Manager	Business	4.7 years	57770711	Active	
USR003	Test	Test	Customer Service	Business	7.4 years	57770003	Active	
USR005	Elon	Musk	Manager	Networks	4.7 years	57770700	Revoked	
USR006	David	Guela	Software Engineer	Engineering	3 months	57771234	Active	
USR007	Tony	Stark	Mechanical Engineer	Engineering	1 months	57771236	Active	
USR008	Alejandro	Garnacho	Customer Service Agent	Engineering	2 months	57770711	Active	
USR011	Sunjeet	Ramlochund	Software Engineer	Business	1.10 years	57770700	Active	
USR012	Paul	Smith	Marketing Assistant	Business	2.3 years	57691234	Active	

Figure 60: GUI Modifying Employee Details

When the "Modify" button is pressed, it triggers a modal interface where the Administrator can make modifications to certain employee details. This modal allows the Administrator to conveniently access and update specific information related to the employee without navigating away from the current page.

The screenshot shows a modal window titled "EDIT EMPLOYEE DETAILS". The modal contains three input fields: "Position" (Marketing Assistant), "Mobile Number" (57891234), and "Assign to Department" (Business). At the bottom right of the modal are two buttons: "Save Changes" (in a green box) and "Close".

Figure 61: Modal for Modifying Employee Details

### 9.9.9 Wireframe: Modifying Department Details

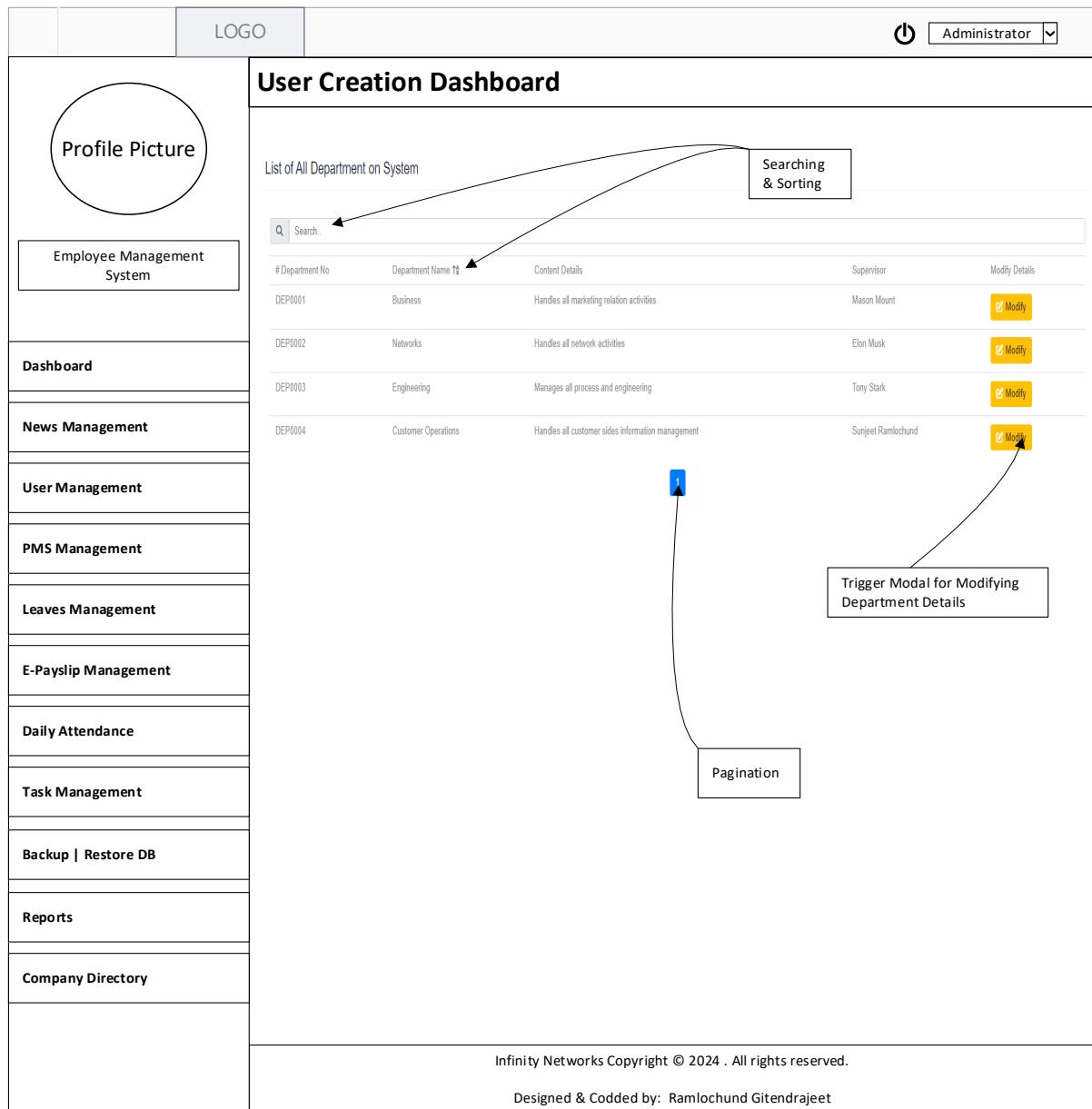


Figure 62: Wireframe: Modifying Department Details

When the "Modify" button is pressed, it triggers a modal interface where the Administrator can make modifications to certain department details. This modal allows the Administrator to conveniently access and update specific information related to the department without navigating away from the current page.

### 9.9.9.1 GUI Modifying Department Details

The screenshot shows the 'User Creation Dashboard' with a sidebar titled 'Employee Management System' containing various management options like Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup / Restore DB, Reports, and Company Directory. The main area displays a table titled 'List of All Department on System' with four entries:

# Department No	Department Name	Content Details	Supervisor	Modify Details
DEP0001	Business	Handles all marketing relation activities	Mason Mount	<button>Modify</button>
DEP0002	Networks	Handles all network activities	Elon Musk	<button>Modify</button>
DEP0003	Engineering	Manages all process and engineering	Tony Stark	<button>Modify</button>
DEP0004	Customer Operations	Handles all customer sides information management	Sunjeet Ramlochund	<button>Modify</button>

At the bottom, there is a footer with copyright information: 'Infinity Networks Copyright © 2024. All rights reserved.' and 'Designed & Coded by Gitendrajeet'. A small number '1' is also visible near the bottom center.

Figure 63:GUI Modifying Department Details

The modal window has a title 'EDIT DEPARTMENT DETAILS' at the top left and a close button at the top right. It contains three input fields: 'Department Name' with 'Business' entered, 'Department Details' with 'Handles all marketing relation activities' entered, and a 'Select Employee to Assign as Supervisor Dropdown List' with 'Mason Mount' selected. At the bottom are two buttons: a green 'Save Changes' button and a grey 'Close' button.

Figure 64:Modal for modifying department

### 9.9.10 Wireframe: PMS Management Dashboard

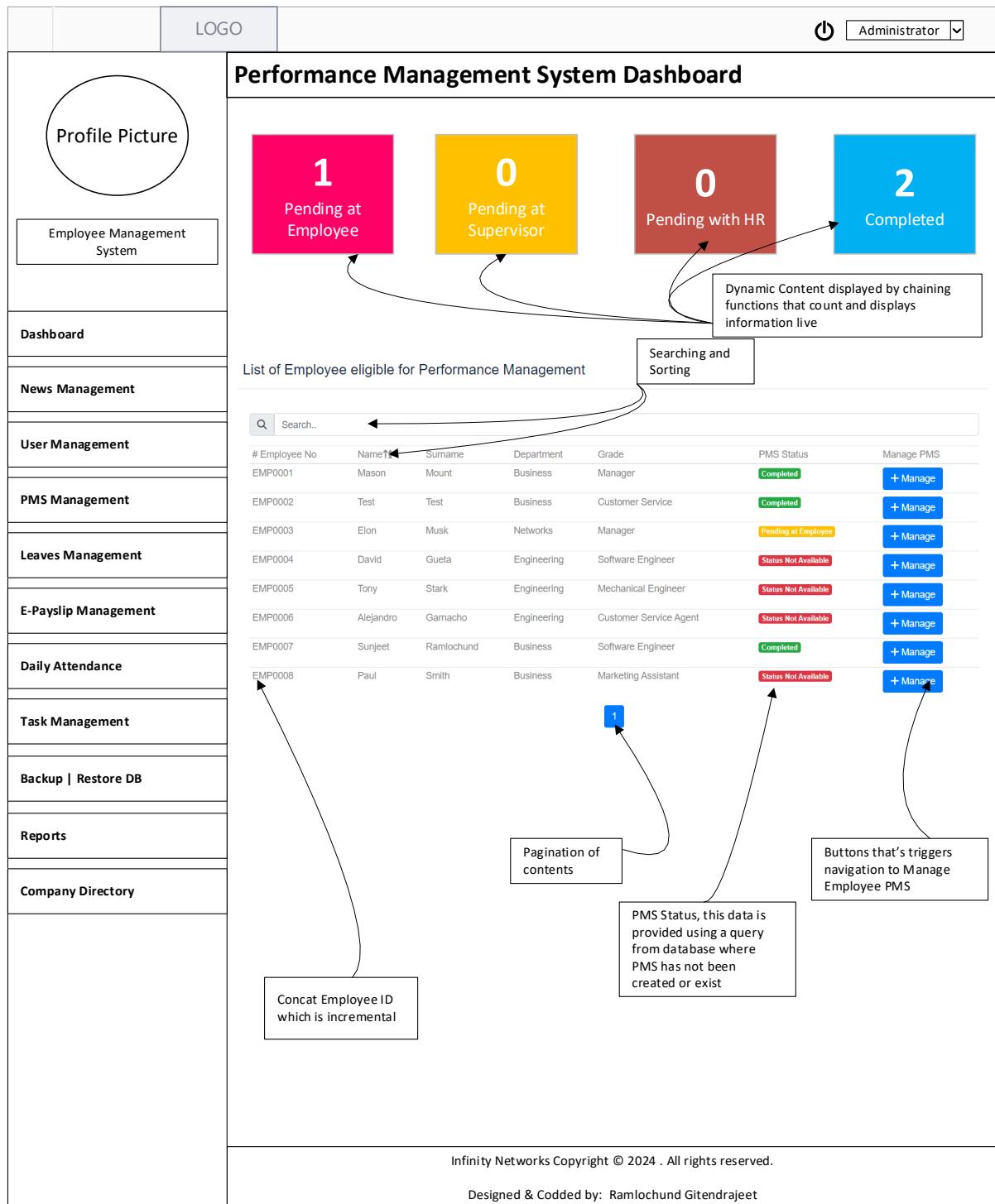


Figure 65: Wireframe PMS Management

### 9.9.10.1 GUI PMS Management Dashboard

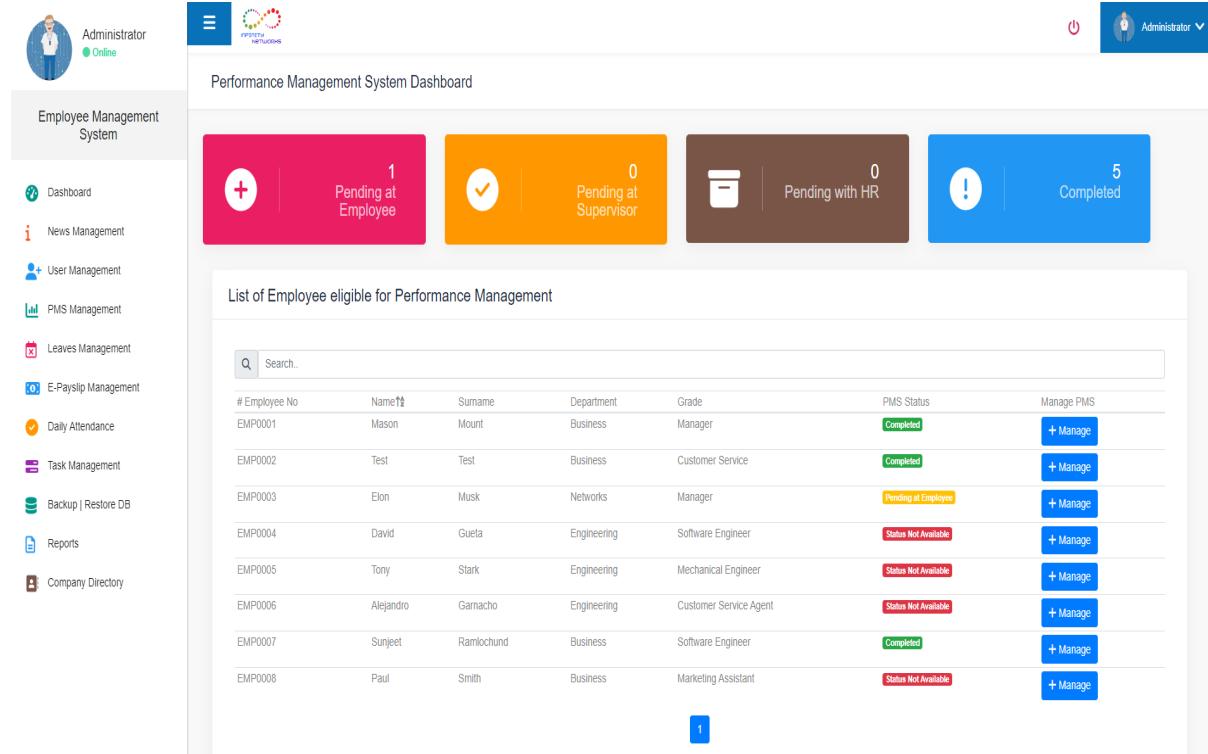


Figure 66: GUI PMS Management Dashboard

The PMS (Performance Management System) Dashboard provides a comprehensive overview of all employees within the organization. From this dashboard, the HR Administrator can easily identify and select employees who are eligible for performance management assessments.

The status of each employee's performance evaluation is clearly indicated and may include categories such as "Status not available," "Completed," "Pending at Employee," and "Pending at Supervisor." These status indicators help track the progress of performance evaluations, allowing for efficient management and coordination of the assessment process.

### 9.9.11 Wireframe: Managing Employee PMS Record

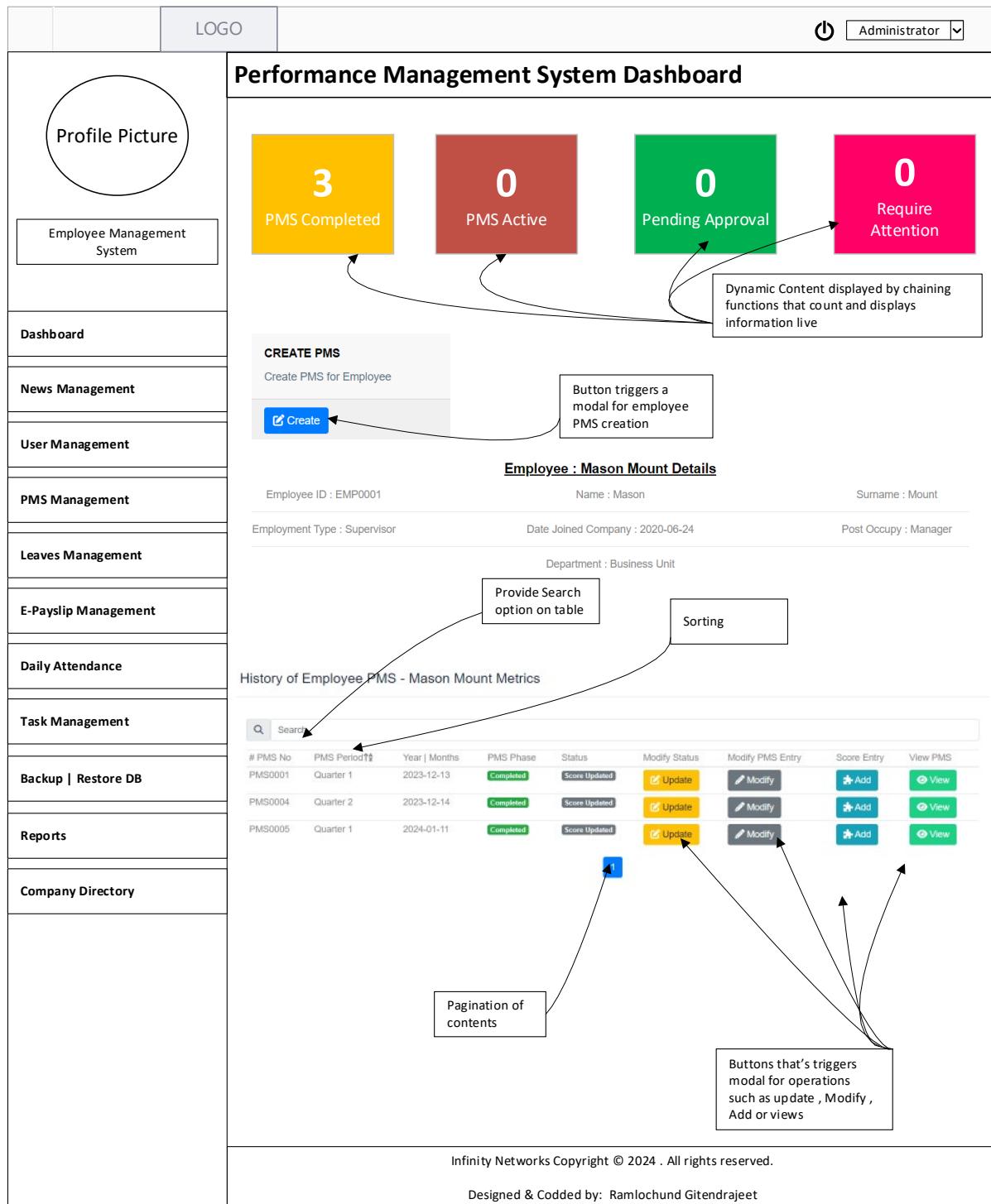


Figure 67: Wireframe Managing PMS

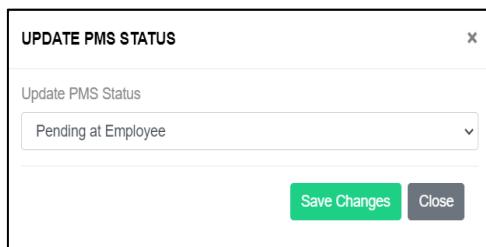
### 9.9.11.1 GUI Managing Employee PMS Record

The screenshot shows the 'Performance Management System Dashboard'. On the left, a sidebar lists various management modules: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup / Restore DB, Reports, and Company Directory. The status for the administrator is shown as 'Online'.

The main dashboard features four colored boxes: orange (PMS Completed: 3), grey (PMS Active: 0), teal (Pending Approval: 0), and pink (Require Attention: 0). Below these are sections for 'CREATE PMS' (Create PMS for Employee) and 'Employee : Mason Mount Details' (Employee ID: EMP0001, Name: Mason, Surname: Mount, Employment Type: Supervisor, Date Joined Company: 2020-05-24, Post Occupied: Manager, Department: Business Unit).

A table titled 'History of Employee PMS - Mason Mount Metrics' lists three entries: PMS0001 (Quarter 1, Status: Score Updated, Modify Status: Update, PMS Entry: Add, View PMS: View), PMS0004 (Quarter 2, Status: Score Updated, Modify Status: Update, PMS Entry: Add, View PMS: View), and PMS0005 (Quarter 1, Status: Score Updated, Modify Status: Update, PMS Entry: Add, View PMS: View).

Figure 68: GUI Managing Employee PMS



### 9.9.11.2 Modal for Modifying PMS Details

The modal window is titled 'MODIFY EMPLOYEE PERFORMANCE SHEET'. It contains several input fields and dropdown menus:

- PMS Period:** Period : Quarter 2, Month and Year : 2024-03-02
- Key Performance Areas:**
  - KPA 1: Financial
  - KPA 2: Process improvement
  - KPA 3: Service Delivery
  - KPA 4: Quality Assurance
- Objectives Set:**
  - Objective 1: Lower the operational costs
  - Objective 2: Design efficient work flow
  - Objective 3: Fast track delivery of software
  - Objective 4: Make regression testing
- Key Performance Indicators:**
  - KPI 1: A Minimum of 30%
  - KPI 2: Create high level flowchart
  - KPI 3: At least 3 weeks
  - KPI 4: Provide test reports

At the bottom are 'Close' and 'Save Changes' buttons.

Figure 69: GUI Modal for Modifying PMS Details

### 9.9.12 Wireframe Creating Employee PMS

The wireframe illustrates the 'Performance Management System Dashboard' interface. On the left is a vertical sidebar menu with the following items:

- Profile Picture
- Employee Management System
- Dashboard
- News Management
- User Management
- PMS Management
- Leaves Management
- E-Payslip Management
- Daily Attendance
- Task Management
- Backup | Restore DB
- Reports
- Company Directory

The main content area is titled 'CREATE PMS FOR EMPLOYEE'. It includes the following sections:

- PMS Period**: Contains 'Period' (Quarter 1 dropdown) and 'Month and Year' (dd/mm/yyyy input field).
- Key Performance Areas**: Contains four input fields labeled KPA 1, KPA 2, KPA 3, and KPA 4.
- Objectives Set**: Contains four input fields labeled Objective 1, Objective 2, Objective 3, and Objective 4.
- Key Performance Indicators**: Contains four input fields labeled KPI 1, KPI 2, KPI 3, and KPI 4.

At the bottom right are two buttons: 'Save Changes' (green) and 'Close' (grey). A modal window is overlaid on the form, containing the following instructions:

- Select option for Quarters , Q1 , Q2
- Input textbox for entry fields
- Submit Button of Form
- Select Month and Year
- Close the modal

At the very bottom of the main content area, there is a copyright notice: 'Infinity Networks Copyright © 2024 . All rights reserved.' and 'Designed & Coded by: Ramlochund Gitendrajeet'

Figure 70: Wireframe Creating Employee PMS

### 9.9.12.1 GUI Creating Employee PMS

**CREATE PMS FOR EMPLOYEE**

PMS Period

Period: Quarter 1 Month and Year: dd/mm/yyyy

Key Performance Areas

KPA 1	KPA 2	KPA 3	KPA 4
-------	-------	-------	-------

Objectives Set

Objective 1	Objective 2	Objective 3	Objective 4
-------------	-------------	-------------	-------------

Key Performance Indicators

KPI 1	KPI 2	KPI 3	KPI 4
-------	-------	-------	-------

**Employee : Mason Mount Details**

Employee ID : EMP0001	Name : Mason	Surname : Mount
Employment Type : Supervisor	Date Joined Company : 2020-06-24	Post Occupy : Manager
Department : Business Unit		

Figure 71: GUI Modal Creating PMS

### 9.9.12.2 GUI Adding PMS Score

**ADD SCORE TO EMPLOYEE PMS SHEET**

**PMS Period**  
Period : Quarter 1 Month and Year : 2024-01-11

**KEY PERFORMANCE INDICATORS**  
KPI No 1 : Zero Complaints      KPI No 2 : Finance      KPI No 3 : Unit Testing      KPI No 4 : Resolution within 1 day

**KEY OBJECTIVES**  
Objectives No 1 : Customer service      Objectives No 2 : Billing      Objectives No 3 : QA      Objectives No 4 : Tracking

**METRICS**  
Metrics No 1 : Pending Employee Input      Metrics No 2 : Pending Employee Input      Metrics No 3 : Pending Employee Input      Metrics No 4 : Pending Employee Input

**INPUT PMS SCORE**  
Score No 1 :      Score No 2 :      Score No 3 :      Score No 4 :

Figure 72: Adding Score to PMS Employee

### 9.9.13 Wireframe View Employee PMS

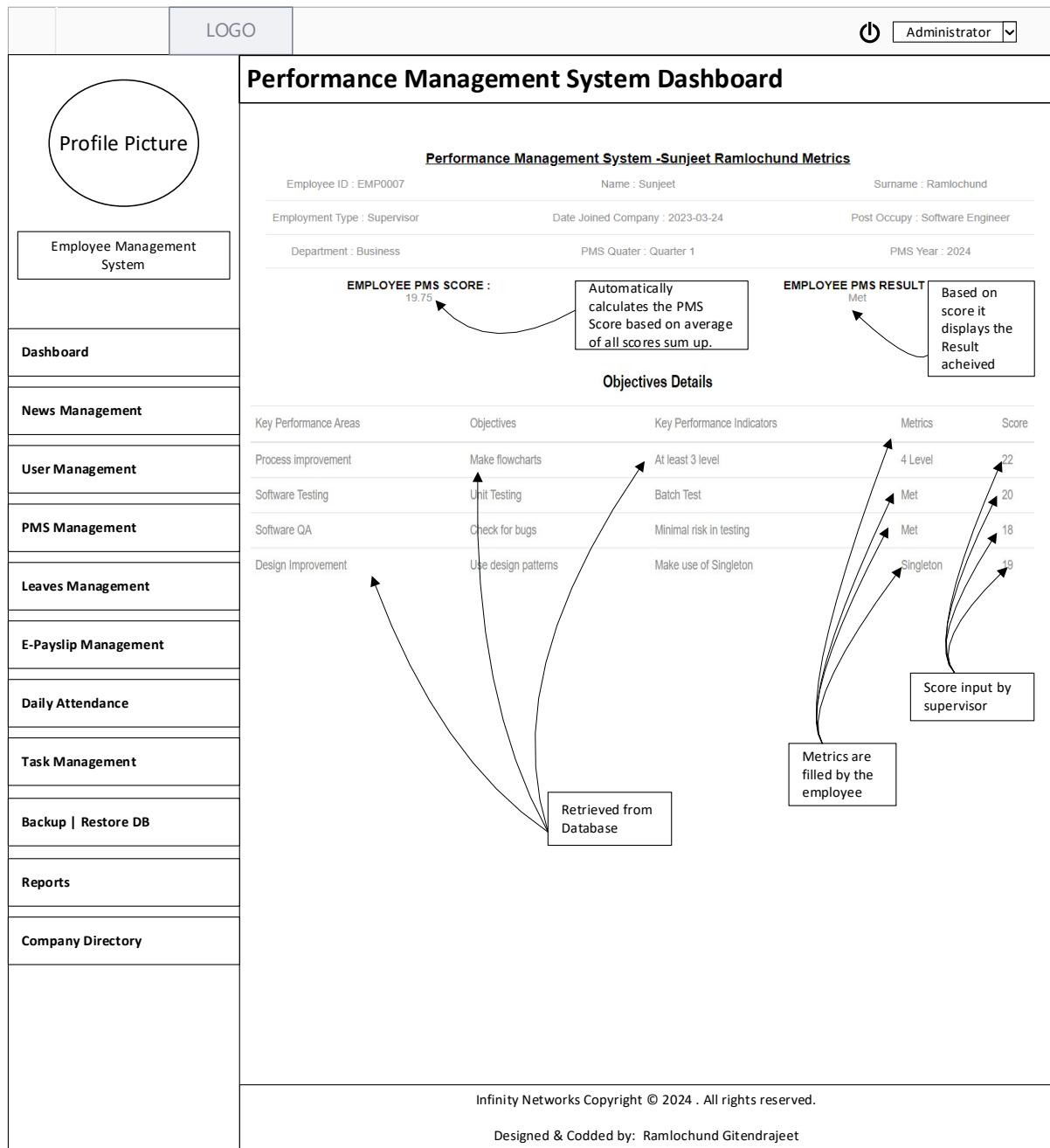


Figure 73: Wireframe View Employee PMS Result

### 9.9.13.1 GUI View Employee PMS Result

Key Performance Areas	Objectives	Key Performance Indicators	Metrics	Score
Process improvement	Make flowcharts	At least 3 level	4 Level	22
Software Testing	Unit Testing	Batch Test	Met	20
Software QA	Check for bugs	Minimal risk in testing	Met	18
Design Improvement	Use design patterns	Make use of Singleton	Singleton	19

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Figure 74:GUI Employee PMS Result

The Employee Performance Management System (PMS) automates the calculation of the employee's PMS Score. This score is determined by averaging all the metric scores provided by the supervisor. Additionally, the PMS Result is derived from this score, utilizing a backend logic that incorporates the average score to determine the employee's overall performance evaluation.

### 9.9.14 Wireframe Leave Management Dashboard

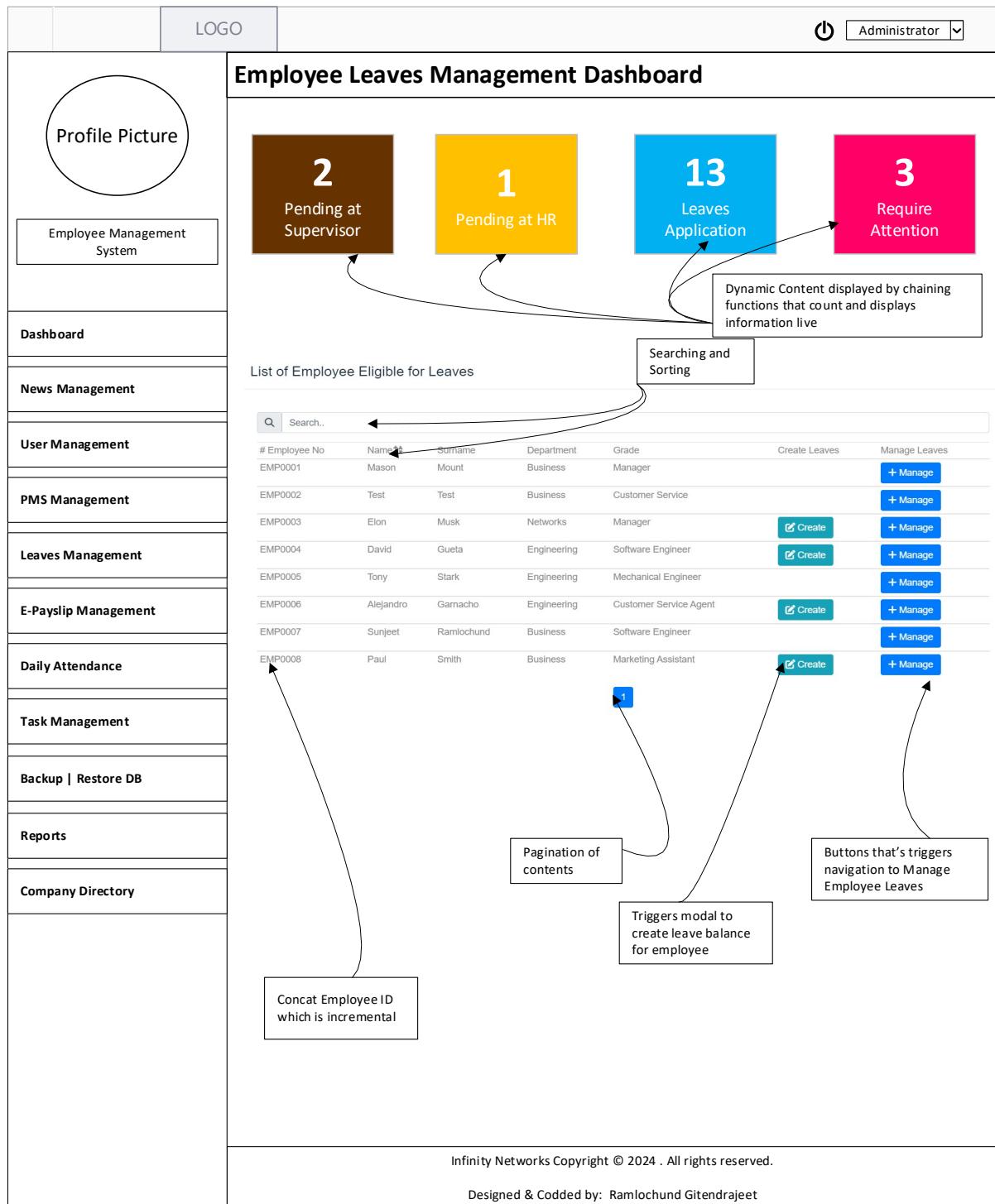


Figure 75: Wireframe Employee Leave Management

### 9.9.14.1 GUI Employee Leave Management Dashboard

The screenshot shows the Employee Leaves Management Dashboard. At the top, there's a header bar with the OEMS logo, a user icon labeled 'Administrator Online', and a power button. Below the header is a navigation sidebar with various management options like Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The main content area has four summary cards: 'Pending at Supervisor' (2), 'Pending at HR' (1), 'Leaves Application' (13), and 'Require Attention' (3). Below these cards is a table titled 'List of Employee Eligible for Leaves' with columns for Employee No, Name, Surname, Department, Grade, Create Leaves, and Manage Leaves. The table lists eight employees from EMP0001 to EMP0008. At the bottom right of the main content area is a small blue circular icon with the number '1'.

Figure 76: GUI Employee Leave Management Dashboard

The screenshot shows a modal dialog box titled 'CREATE EMPLOYEE LEAVE BALANCE'. It contains three input fields for 'Wellness Leave Balance', 'Vacation Leave Balance', and 'Sick Leave Balance', each with a corresponding numeric input field. At the bottom are two buttons: a green 'Save Changes' button and a grey 'Close' button.

Figure 77: GUI Create Employee Leave Balance

Validation for numeric input types has been implemented to ensure data integrity, aligning with the standards discussed in section 8.10 on *Data Used for PMS and Leave Management*.

### 9.9.15 Wireframe Managing Employee Leaves

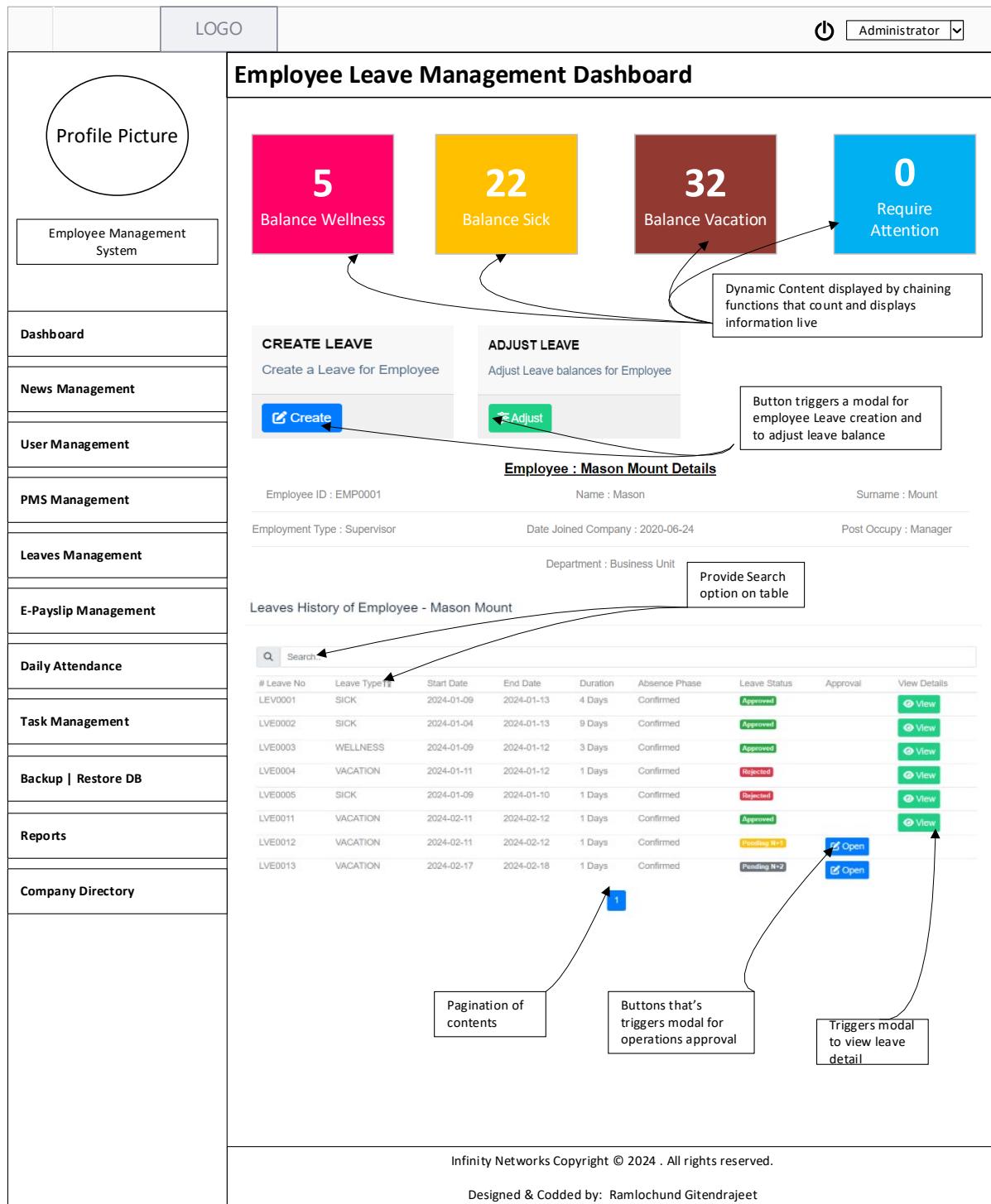


Figure 78: Wireframe Manage Employee Leaves

A logic has been integrated into the table where the "Open" button for approval appears only if the leave has not been updated.

### 9.9.15.1 GUI Manage Employee Leaves

**Employee Management System**

- Administrator Online
- Dashboard
- News Management
- User Management
- PMS Management
- Leaves Management
- E-Payslip Management
- Daily Attendance
- Task Management
- Backup | Restore DB
- Reports
- Company Directory

**Infinity Networks**

**BALANCE**

- Balance Wellness: 0
- Balance Sick: 22
- Balance Vacation: 75
- Require Attention: 2

**CREATE LEAVE**  
Create a Leave for Employee  
**Create**

**ADJUST LEAVE**  
Adjust Leave balances for Employee  
**Adjust**

**Employee : Mason Mount Details**

Employee ID : EMP0001	Name : Mason	Surname : Mount
Employment Type : Supervisor	Date Joined Company : 2020-06-24	Post Occupy : Manager
Department : Business Unit		

**Leaves History of Employee - Mason Mount**

# Leave No	Leave Type	Start Date	End Date	Duration	Absence Phase	Leave Status	Approval	View Details
LEV0001	SICK	2024-01-09	2024-01-13	4 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0002	SICK	2024-01-04	2024-01-13	9 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0003	WELLNESS	2024-01-09	2024-01-12	3 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0004	VACATION	2024-01-11	2024-01-12	1 Days	Confirmed	Rejected	<b>View</b>	<b>View</b>
LVE0005	SICK	2024-01-09	2024-01-10	1 Days	Confirmed	Rejected	<b>View</b>	<b>View</b>
LVE0011	VACATION	2024-02-11	2024-02-12	1 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0012	VACATION	2024-02-11	2024-02-12	1 Days	Confirmed	Pending N+1	<b>Open</b>	<b>Open</b>
LVE0013	VACATION	2024-02-17	2024-02-18	1 Days	Confirmed	Pending N+2	<b>Open</b>	<b>Open</b>

Figure 79:GUI Manage Employee Leaves Part1

**Employee Management System**

- Administrator Online
- Dashboard
- News Management
- User Management
- PMS Management
- Leaves Management
- E-Payslip Management
- Daily Attendance
- Task Management
- Backup | Restore DB
- Reports
- Company Directory

**Infinity Networks**

**Leaves History of Employee - Mason Mount**

# Leave No	Leave Type	Start Date	End Date	Duration	Absence Phase	Leave Status	Approval	View Details
LEV0001	SICK	2024-01-09	2024-01-13	4 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0002	SICK	2024-01-04	2024-01-13	9 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0003	WELLNESS	2024-01-09	2024-01-12	3 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0004	VACATION	2024-01-11	2024-01-12	1 Days	Confirmed	Rejected	<b>View</b>	<b>View</b>
LVE0005	SICK	2024-01-09	2024-01-10	1 Days	Confirmed	Rejected	<b>View</b>	<b>View</b>
LVE0011	VACATION	2024-02-11	2024-02-12	1 Days	Confirmed	Approved	<b>View</b>	<b>View</b>
LVE0012	VACATION	2024-02-11	2024-02-12	1 Days	Confirmed	Pending N+1	<b>Open</b>	<b>Open</b>
LVE0013	VACATION	2024-02-17	2024-02-18	1 Days	Confirmed	Pending N+2	<b>Open</b>	<b>Open</b>

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Figure 80:GUI Manage Employee Leaves Part2

### 9.9.16 Wireframe Creating Employee Leave

The wireframe illustrates the interface for creating employee leave. On the left, a vertical sidebar lists various management modules: Profile Picture, Employee Management System, Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The main area is titled "Employee Leave Management Dashboard" and contains a sub-section for "CREATE LEAVE FOR EMPLOYEE". It includes fields for "Leave Type" (dropdown set to "Sick Leave"), "Start Date" (dd/mm/yyyy), "End Date" (dd/mm/yyyy), and "Leave Reason" (text input). A note states, "Leave Balance is automatically displayed to employee upon selecting leave type". Below these fields are buttons for "Select Start Date", "Select End Date", "Save Changes", "Close", "Close the modal", and "Submit Button of Form". A note also indicates, "Leave duration is automatically calculated by the system". At the bottom of the main section, there is a footer with copyright information: "Infinity Networks Copyright © 2024 . All rights reserved." and "Designed & Codded by: Ramlochund Gitendrajeet".

Figure 81: Wireframe Creating Employee Leave

The system has the capability to dynamically display an employee's leave balance when they select leave options. Additionally, when the employee chooses a start date and an end date, the system automatically calculates the leave duration requested by the employee. If the calculated leave duration exceeds the available leave balance, the system promptly displays an error message and prevents the operation from proceeding further.

**9.9.16.1 GUI Creating Employee Leave**

The screenshot shows a modal window titled "CREATE LEAVE FOR EMPLOYEE". It contains the following fields:

- Leave Type:** A dropdown menu showing "Vacation Leave".
- Vacation Leave Balance:** Text displayed as "75".
- Select Start Date and End Date:**
  - Start Date:** Text input field containing "16/02/2024" with a calendar icon.
  - End Date:** Text input field containing "24/02/2024" with a calendar icon.
- Total Leave Duration:** Text displayed as "Duration: 8 days".
- Leave Reason:** A text input field containing "Personal Reasons".

At the bottom right are two buttons: "Save Changes" (green) and "Close".

Figure 82: GUI Creating Employee Leave

**9.9.16.2 GUI Adjusting Employee Leave Balance**

The screenshot shows a modal window titled "ADJUST LEAVE BALANCES FOR EMPLOYEE". It displays three leave balance fields:

- Wellness Leave Balance:** Text input field containing "0".
- Vacation Leave Balance:** Text input field containing "67".
- Sick Leave Balance:** Text input field containing "22".

At the bottom right are two buttons: "Save Changes" (green) and "Close".

Figure 83: GUI Adjusting Employee Leave Balance

### 9.9.17 Wireframe: E-Payslip Management Dashboard

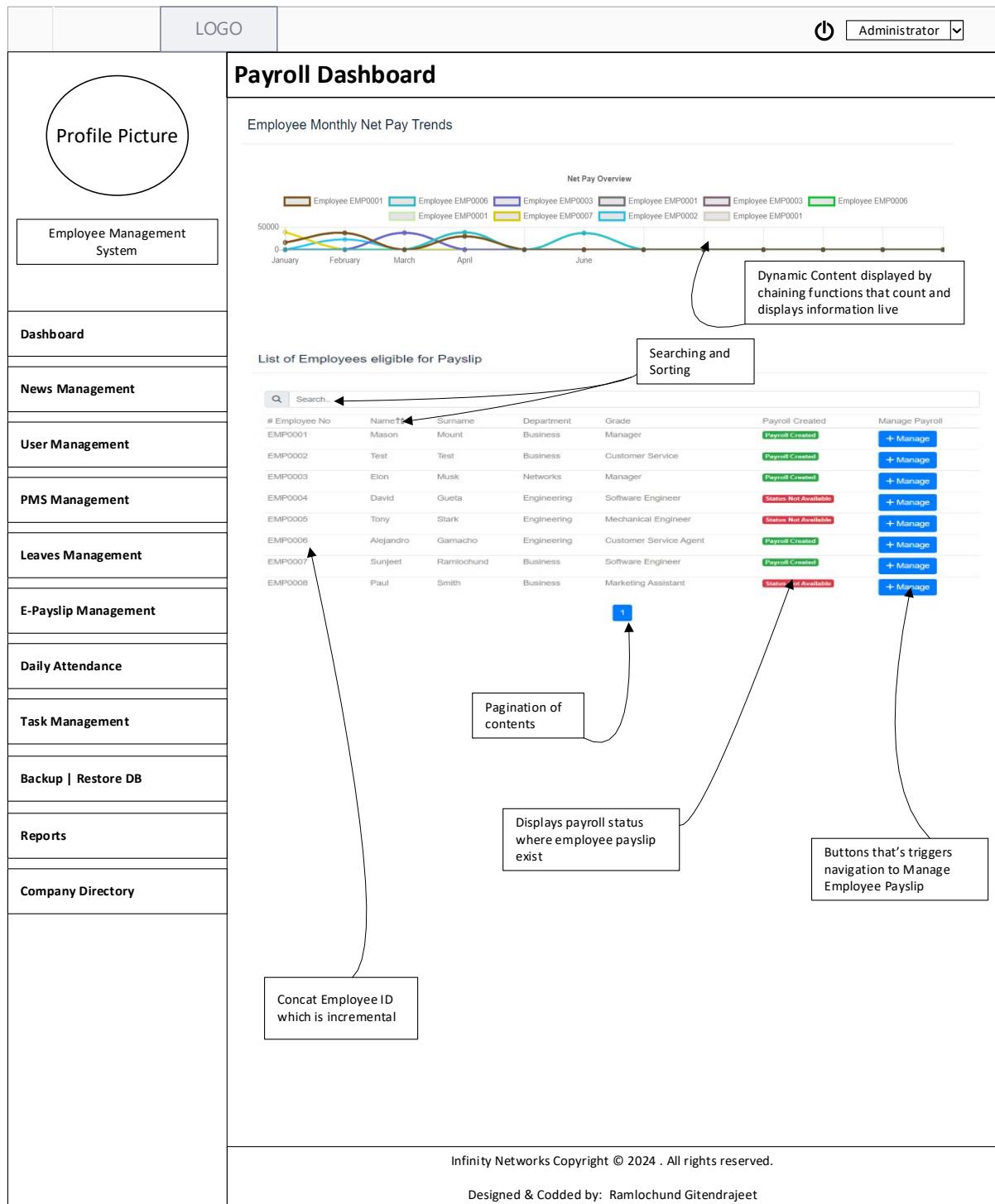


Figure 84: Wireframe E-Payslip Management

### 9.9.17.1 GUI E-Payslip Management

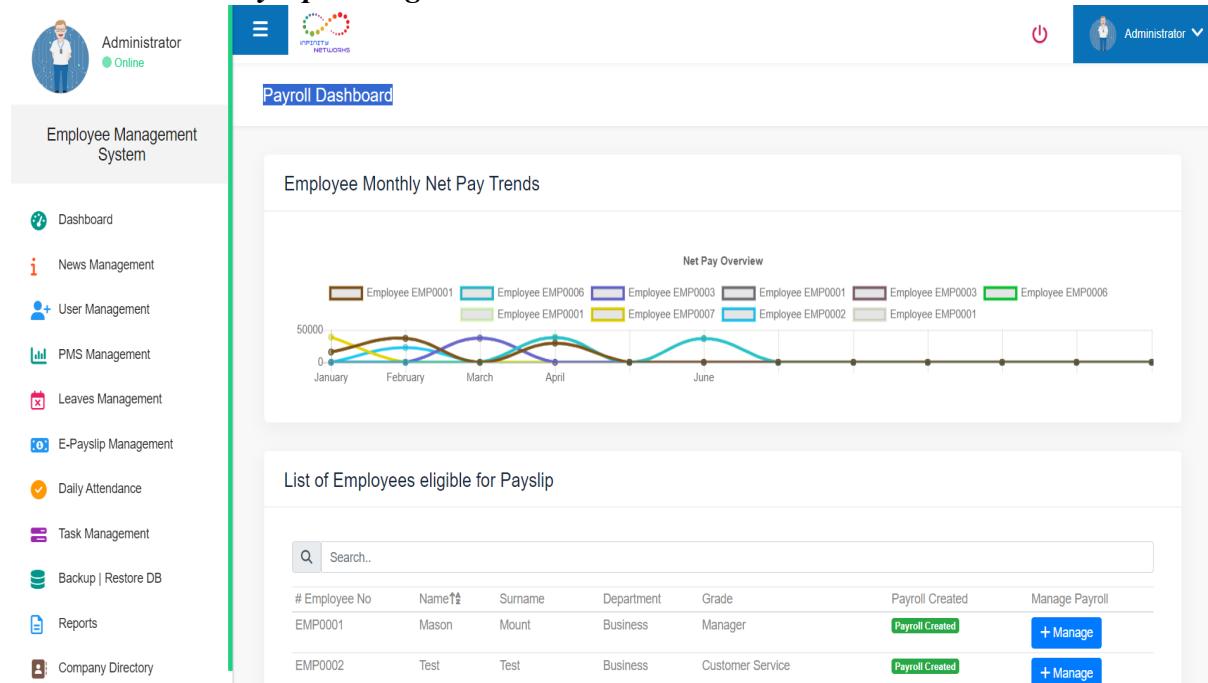


Figure 85: GUI E-Payslip Management Part 1

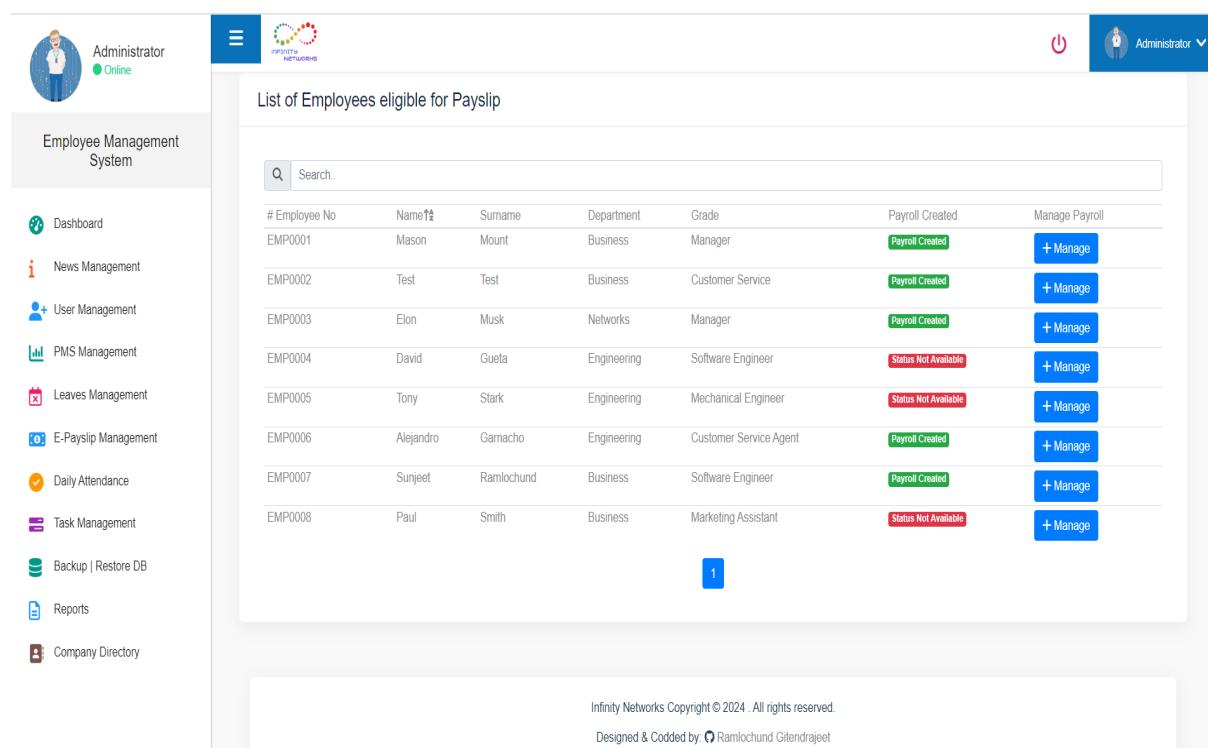


Figure 86: GUI E-Payslip Management Part 2

### 9.9.18 Wireframe : Manage Employee Payslip

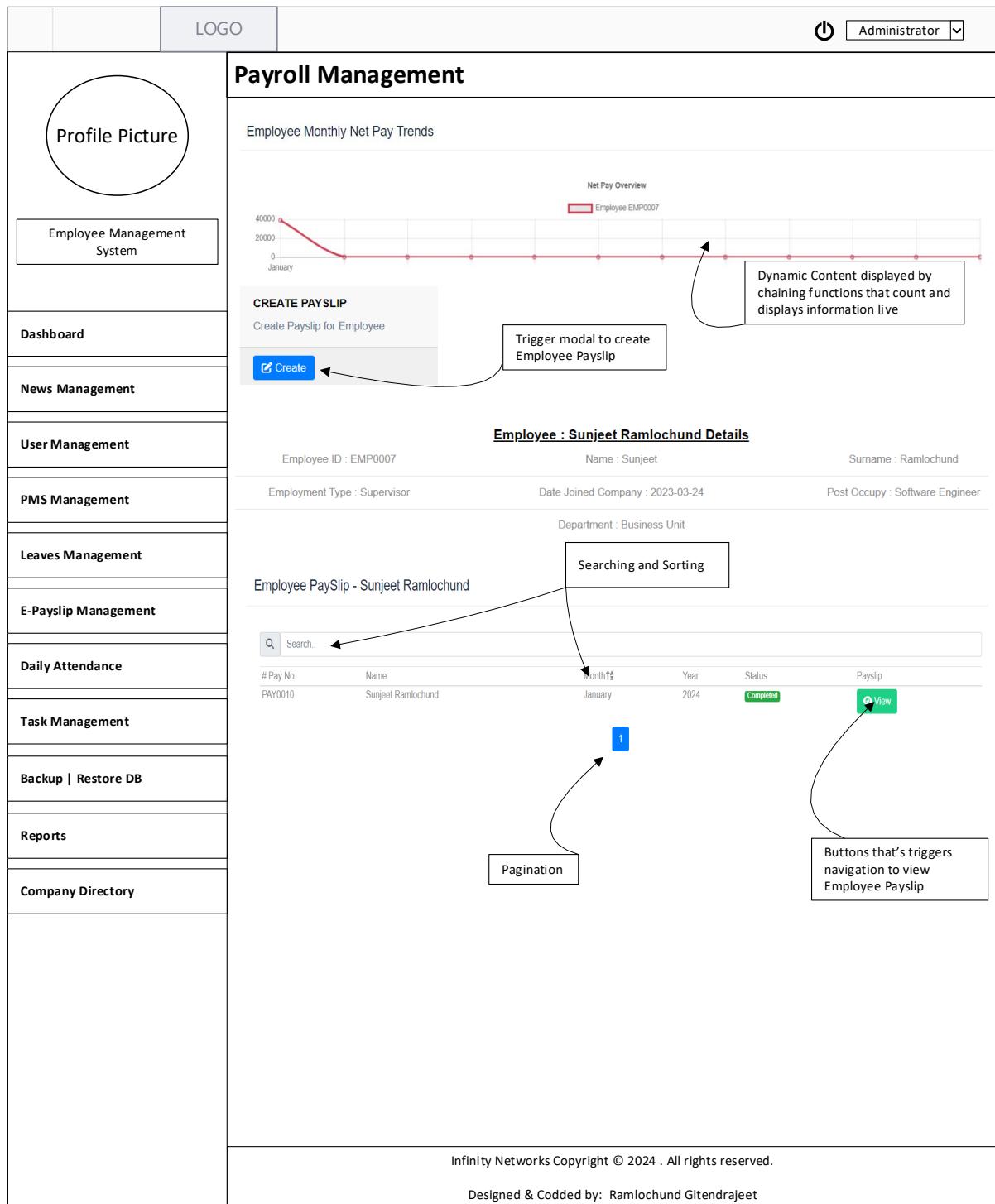


Figure 87: Wireframe Manage Employee Payslip

### 9.9.18.1 GUI Manage Employee Payslip

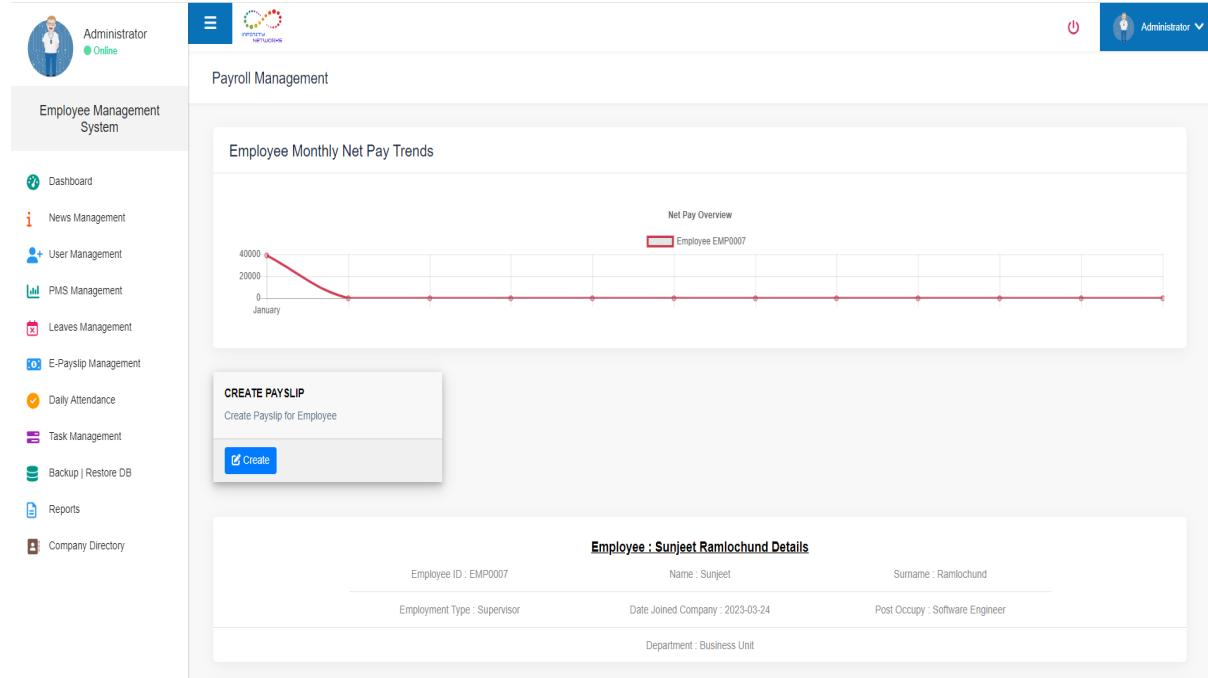


Figure 88: GUI Manage Employee Payslip Part 1

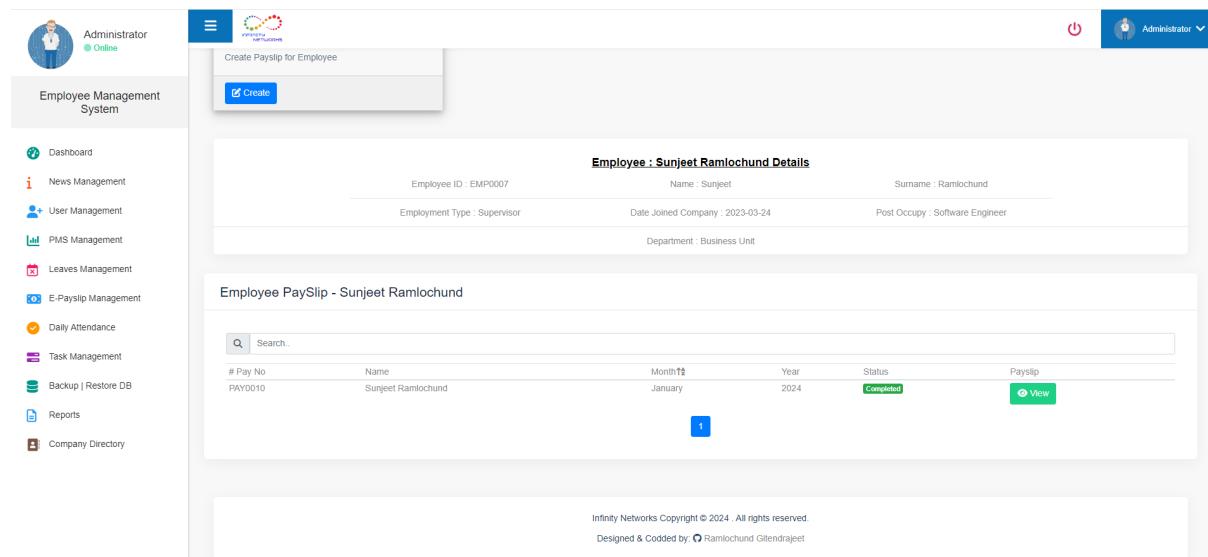


Figure 89: GUI Manage Employee Payslip Part 2

### 9.9.19 Wireframe Creating Employee Payslip

The wireframe illustrates the process of creating an employee payslip. It features a sidebar menu on the left and a main 'Payroll Management' form on the right.

**Left Sidebar (Employee Management System):**

- Profile Picture
- Employee Management System
- Dashboard
- News Management
- User Management
- PMS Management
- Leaves Management
- E-Payslip Management
- Daily Attendance
- Task Management
- Backup | Restore DB
- Reports
- Company Directory

**Main Form: Payroll Management - CREATE PAYSLIP FOR EMPLOYEE**

**Pay Period:** All amounts are in Mauritian Rupees (Mur) / Rs. Month: January, Year: 2024. A dropdown box labeled "Select option for Month and Year" is shown.

**Earnings:** Basic Salary: Rs. 36256, Overtime: Enter overtime, Bus Fare: Enter bus fare.

**Deductions:** CSG Contribution: 543.84, Medical Contribution: 362.56, NSF Contribution: 340.8064.

**Overall Pay Information:** Gross Pay: 36256, Deductions: 1247.21, Net Pay: Calculated value.

**Annotations:**

- Automatic calculations are performed upon user enters Overtime and Bus fare.
- System automatically adds employee basic salary based on the logic designed for payslip.
- Input number for entry fields.
- Submit Button of Form.
- Close the modal.
- Save Changes.
- Close.
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- Designed & Codded by: Ramlochund Gitendrajeet

Figure 90: Wireframe Creating Employee Payslip

### 9.9.19.1 GUI Creating Employee Payslip

**CREATE PAYSLIP FOR EMPLOYEE**

**Pay Period**  
All amount are in Mauritian Rupees(Mur) / Rs.

Month	Year
February	2024

**Earnings**

Basic Salary	Overtime	Bus Fare
Rs. 36256	7500	2450

**Deductions**

CSG Contribution	Medical Contribution	NSF Contribution
543.84	362.56	340.8064

**Overall Pay Information**

Gross Pay	Deductions	Net Pay
46206.00	1247.21	44958.79

**Buttons:** Save Changes, Close

Figure 91: GUI Creating Employee Payslip

When a user creates a payslip, the system automatically calculates contributions for CSG, Medical, and NSF. The payslip itself is generated automatically with just two inputs from the user: overtime and bus fare. Once these inputs are filled out in the form, the system promptly processes the data and outputs deductions, gross pay, and net pay without delay.

### 9.9.19.2 GUI View Payslip

**INFINITY NETWORKS PAY SLIP**

Employee ID : EMP0001	Name : Mason
Surname : Mount	Employment Type : Supervisor
Department : Business Unit	Post Occupy : Manager
Month : January	Year : 2024

Earnings	Amount(Rs)	Deductions	Amount(Rs)
Basic Salary	16500.00	Medical Contribution	165.00
Overtime	0.00	CSG Contribution	247.50
Bus Fare	0	NSF Contribution	155.10

Gross Pay(Rs)	Deductions(Rs)	Net Pay(Rs)
16500	567.60	15932

Figure 92: GUI View Payslip

### 9.9.20 Wireframe Daily Attendance (Views)

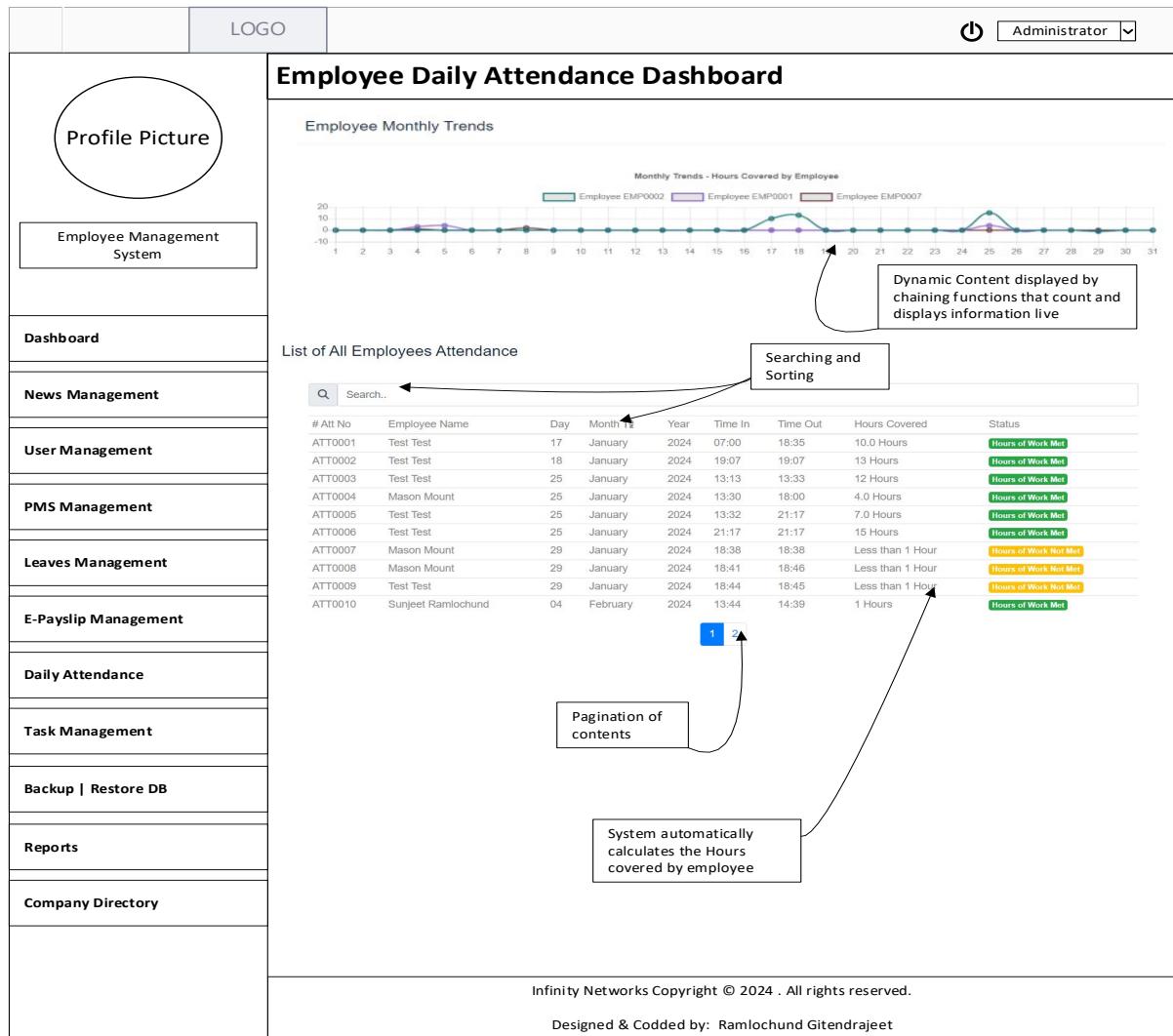


Figure 93: Wireframe Employee Attendance

#### 9.9.20.1 GUI Employee Attendance Dashboard

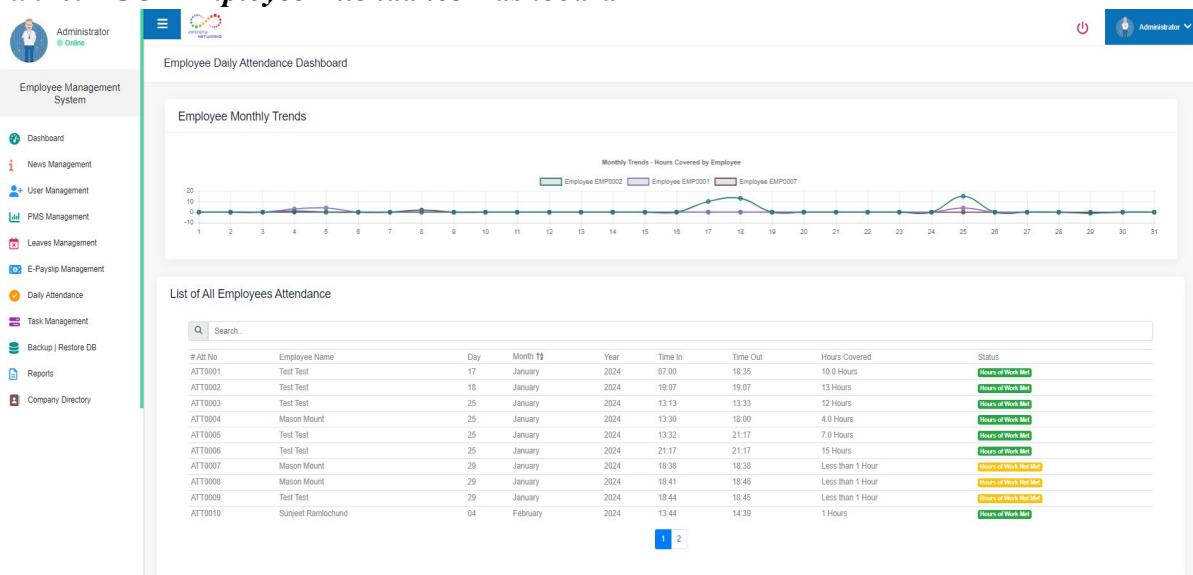


Figure 94: GUI Employee Attendance

### 9.9.21 Wireframe Task Management Dashboard (Views)

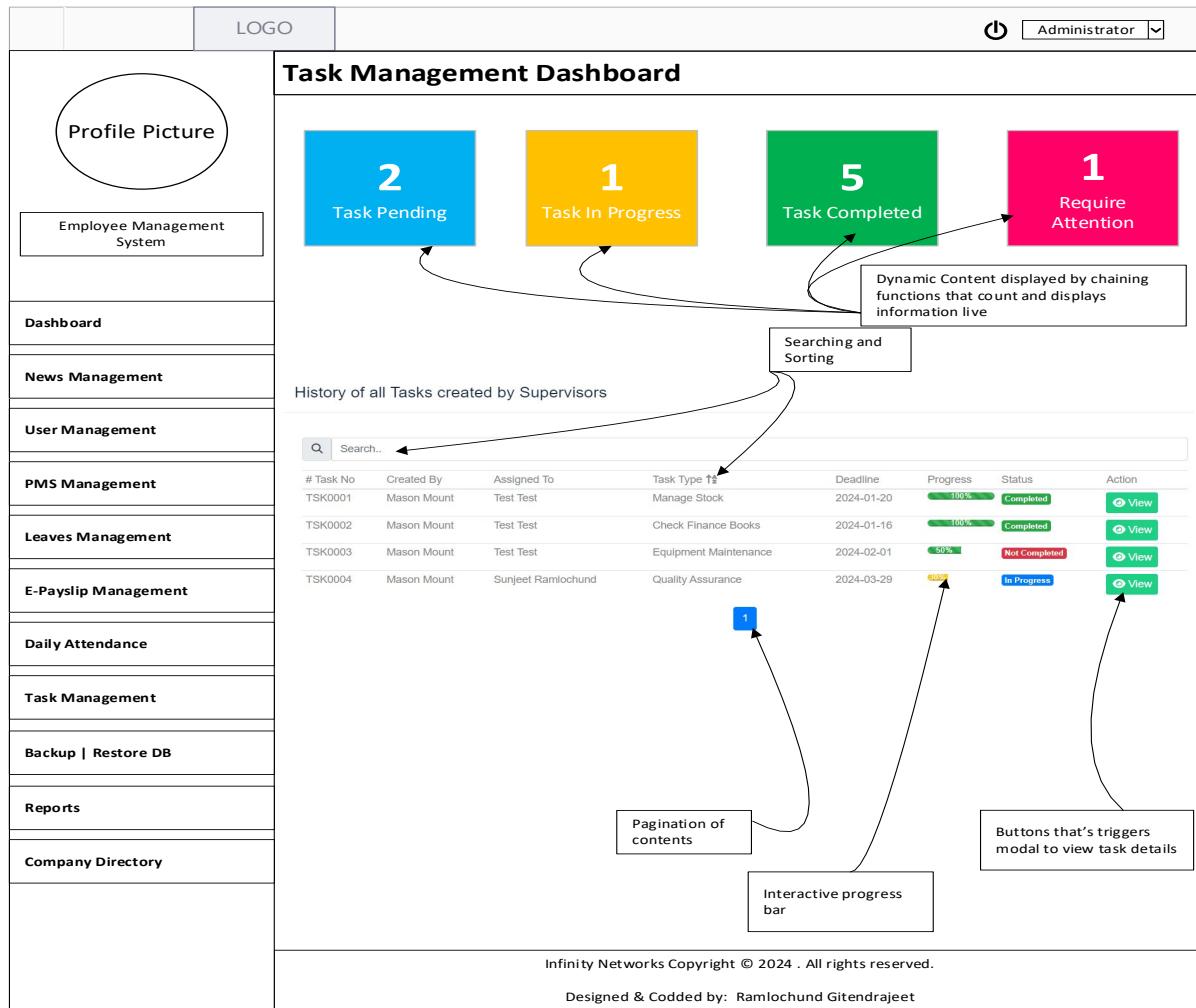


Figure 95: Wireframe Task Management

#### 9.9.21.1 GUI Task Management

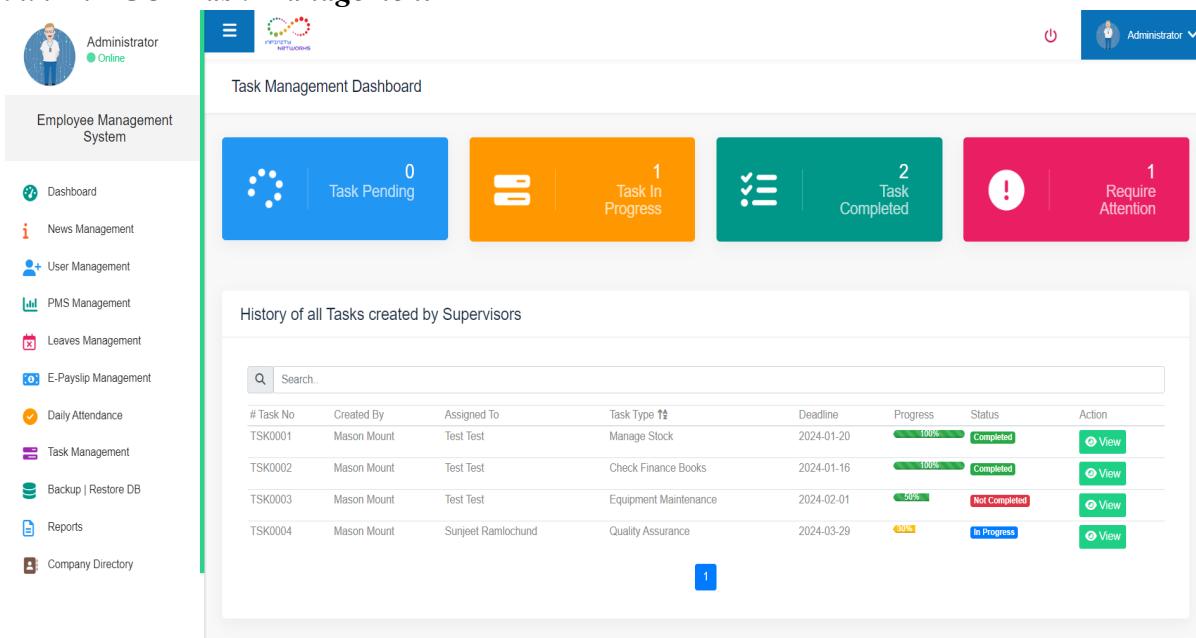


Figure 96: GUI Task Management

### 9.9.22 Wireframe Backup | Restore Database

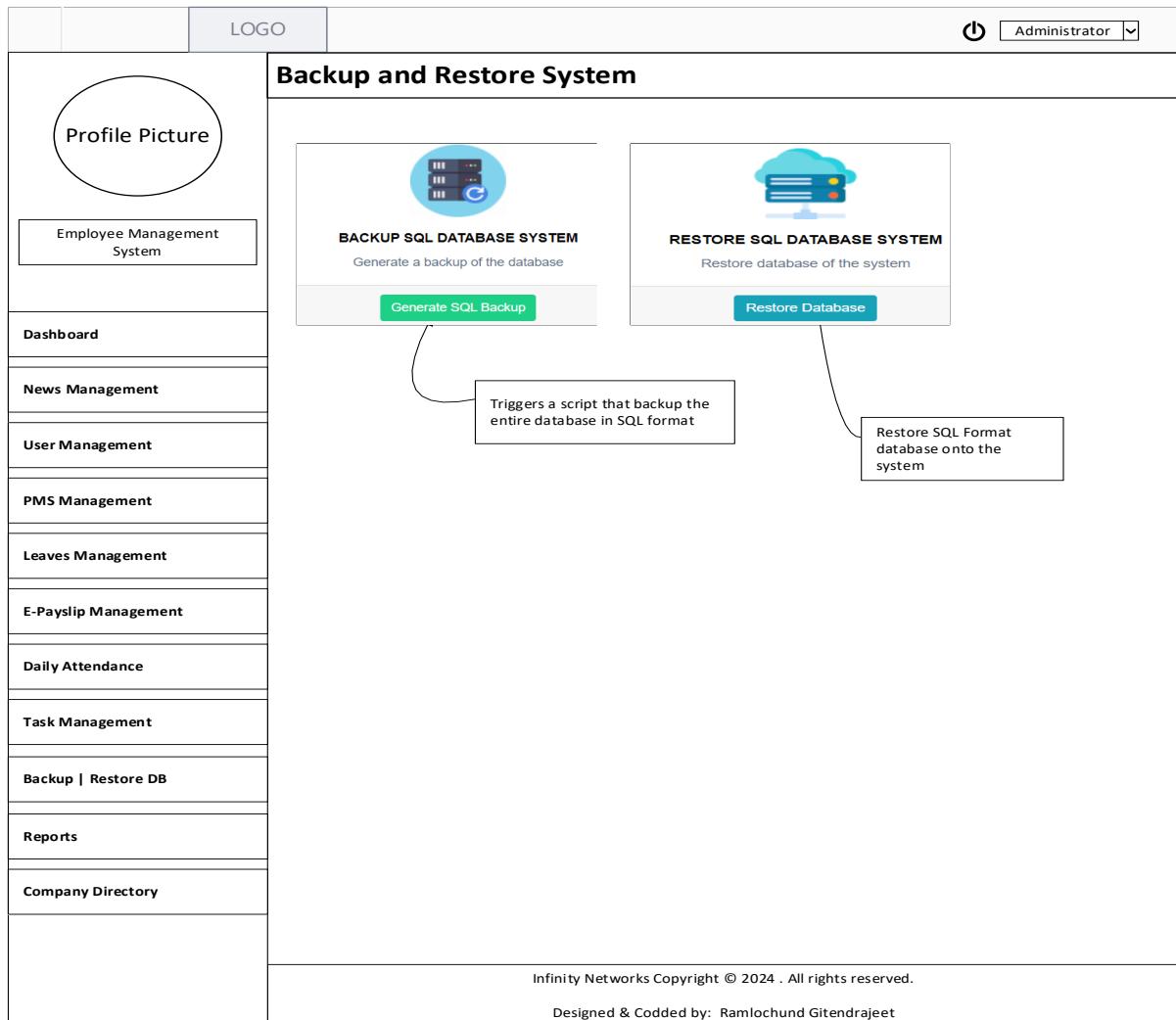


Figure 97: Wireframe Backup | Restore Database

#### 9.9.22.1 GUI Backup | Restore Database

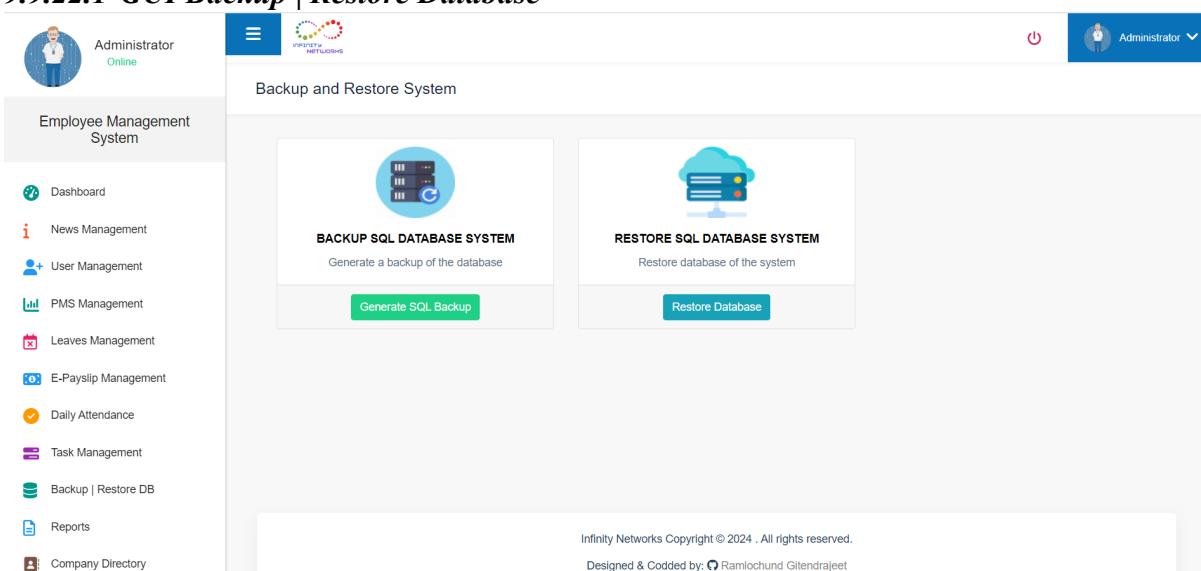


Figure 98: GUI Backup | Restore Database

### 9.9.23 Wireframe Reports

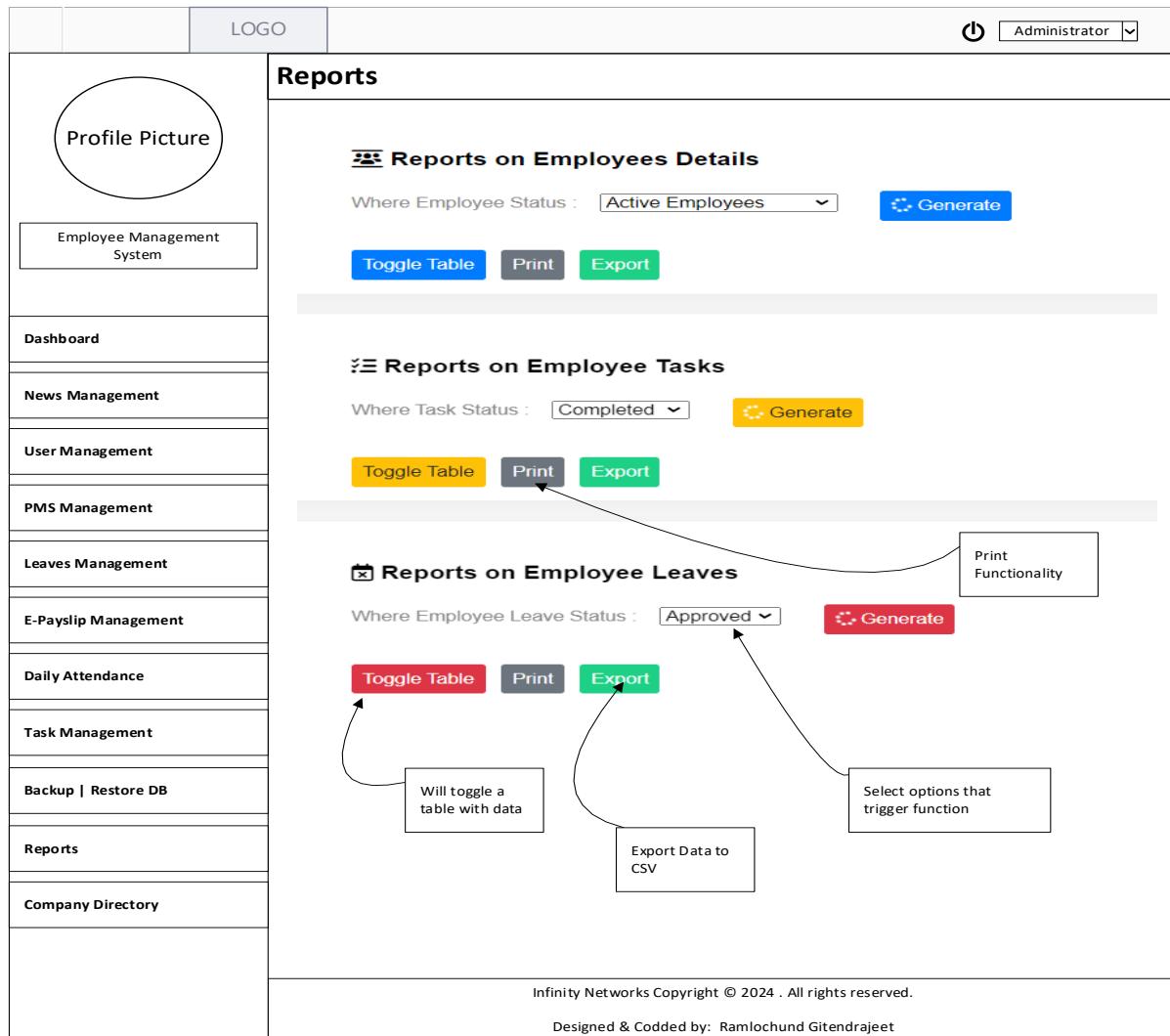


Figure 99: Wireframe Reports

#### 9.9.23.1 GUI Reports Part 1

The screenshot shows the actual GUI interface for reporting, mirroring the wireframe structure.

- Reports on Employees Details:** Displays a table of employees with columns: Name, Surname, Category, Position, Department, Contact, Date Joined, and Status. All employees listed are marked as Active.
- Reports on Employee Tasks:** A partially visible report card with a generate button.
- Reports on Employee Leaves:** A partially visible report card with a generate button.

Figure 100: GUI Reports Part I

### 9.9.23.2 GUI Reports Part 2

**Reports on Employee Tasks**

Where Task Status :

# Task ID	Assigned By	Task Name	Description	Deadline	Status	Feedback
TSK0001	Mason Mount	Manage Stock	Check mobile stock and order new quantity	2024-01-20	Completed	Stock updated
TSK0002	Mason Mount	Check Finance Books	Organize the cash book of Marketing	2024-01-16	Completed	

**Reports on Employee Leaves**

Where Employee Leave Status :

# Leave ID	Employee Name	Leave Type	Start Date	End Date	Duration	Status
LVE0004	Mason Mount	vacation	2024-01-11	2024-01-12	1	Rejected
LVE0005	Mason Mount	sick	2024-01-09	2024-01-10	1	Rejected

Figure 101: GUI Reports Part 2

### 9.9.23.3 GUI Reports Exporting to CSV

**Reports on Employee Tasks**

Where Task Status :

# Task ID	Assigned By	Task Name	Description	Deadline	Status	Feedback
TSK0001	Mason Mount	Manage Stock	Check mobile stock and order new quantity	2024-01-20	Completed	Stock updated
TSK0002	Mason Mount	Check Finance Books	Organize the cash book of Marketing	2024-01-16	Completed	

**Reports on Employee Leaves**

Where Employee Leave Status :

# Leave ID	Employee Name	Leave Type	Start Date	End Date	Duration	Status
LVE0004	Mason Mount	vacation	2024-01-11	2024-01-12	1	Rejected
LVE0005	Mason Mount	sick	2024-01-09	2024-01-10	1	Rejected

Figure 102: GUI Report Exports

### 9.9.24 Wireframe Company Directory

The wireframe illustrates the Company Directory page of the Employee Management System. The left sidebar contains a profile picture placeholder and a list of management modules: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The main content area is titled 'Company Directory' and features a search bar labeled 'Search employees...'. Below the search bar is a grid of employee cards. Each card displays an employee's name, email, phone number, department, and role. A callout box labeled 'Usage of Cards' points to the grid. Another callout box labeled 'Option to search for employee by name' points to the search bar. At the bottom of the page, there is a footer with copyright information.

Employee Name	Email	Phone	Department	Role
Mason Mount	test2@test.com	2010003	Business	Manager
Test Test	test30@test.com	2010003	Business	Customer Service
Elon Musk	test32@test.com	2035689	Networks	Manager
David Gueta	test10@test.com	2031001	Engineering	Software Engineer
Tony Stark	stark@test.com	2031002	Engineering	Mechanical Engineer
Alejandro Garnacho	garnacho@test.com	2010006	Engineering	Customer Service Agent
Sunjeet Ramlochund	test7@test.com	2010000	Business	Software Engineer
Paul Smith	test17@test.com	2021234	Business	Marketing Assistant

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Designed & Codded by: Ramlochund Gitendrajeet

Figure 103: Wireframe Company Directory

**9.9.24.1 GUI Company Directory**

The screenshot shows the 'Company Directory' section of the Employee Management System. At the top, there's a header with a user icon labeled 'Administrator' and a status 'Online'. Below the header is a search bar with the placeholder 'Search employees...'. The main area displays a grid of employee profiles in three rows:

Employee Name	Role	Contact Information
Mason Mount	Manager	Email: test2@test.com, Phone: 2010003, Department: Business
Test Test	Customer Service	Email: test30@test.com, Phone: 2010003, Department: Customer Service
Elon Musk	Manager	Email: test32@test.com, Phone: 2035689, Department: Networks
David Gueta	Software Engineer	Email: test10@test.com, Phone: 2031001, Department: Engineering
Tony Stark	Mechanical Engineer	Email: stark@test.com, Phone: 2031002, Department: Engineering
Alejandro Garnacho	Customer Service Agent	Email: garnacho@test.com, Phone: 2010006, Department: Engineering
Sunjeet Ramlochund	Software Engineer	Email: test7@test.com, Phone: 2010000, Department: Business
Paul Smith	Marketing Assistant	Email: test17@test.com, Phone: 2021234, Department: Business

The sidebar on the left lists various management modules: Dashboard, News Management, User Management, PMS Management, Leaves Management, E-Payslip Management, Daily Attendance, Task Management, Backup | Restore DB, Reports, and Company Directory. The 'Company Directory' module is currently selected.

Figure 104: GUI Company Directory

## 9.10 WIREFRAME CASE: SUPERVISOR

### 9.10.1 Wireframe Supervisor Dashboard

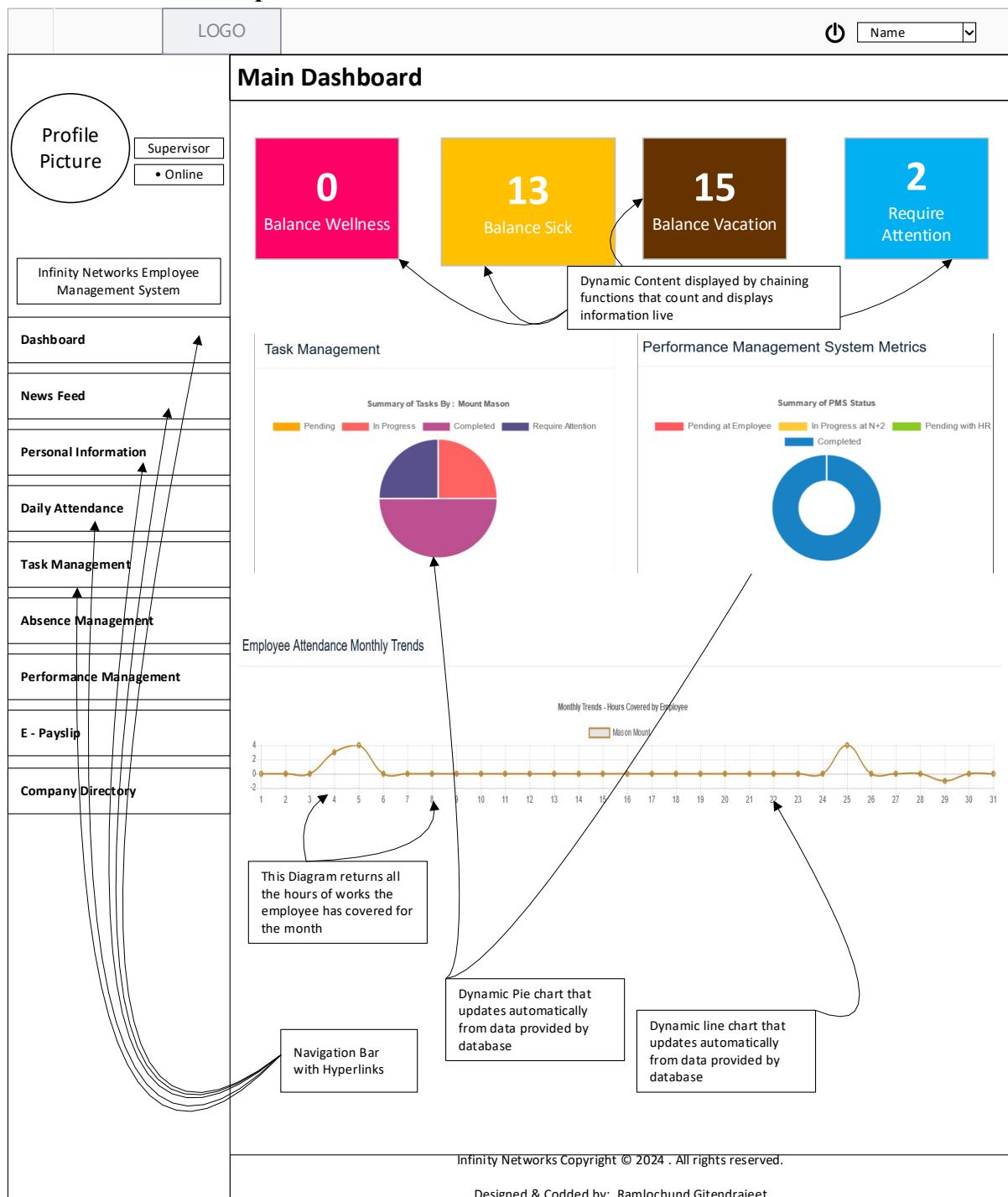


Figure 105:Wireframe Supervisor Dashboard

### 9.10.1.1 GUI Supervisor Dashboard

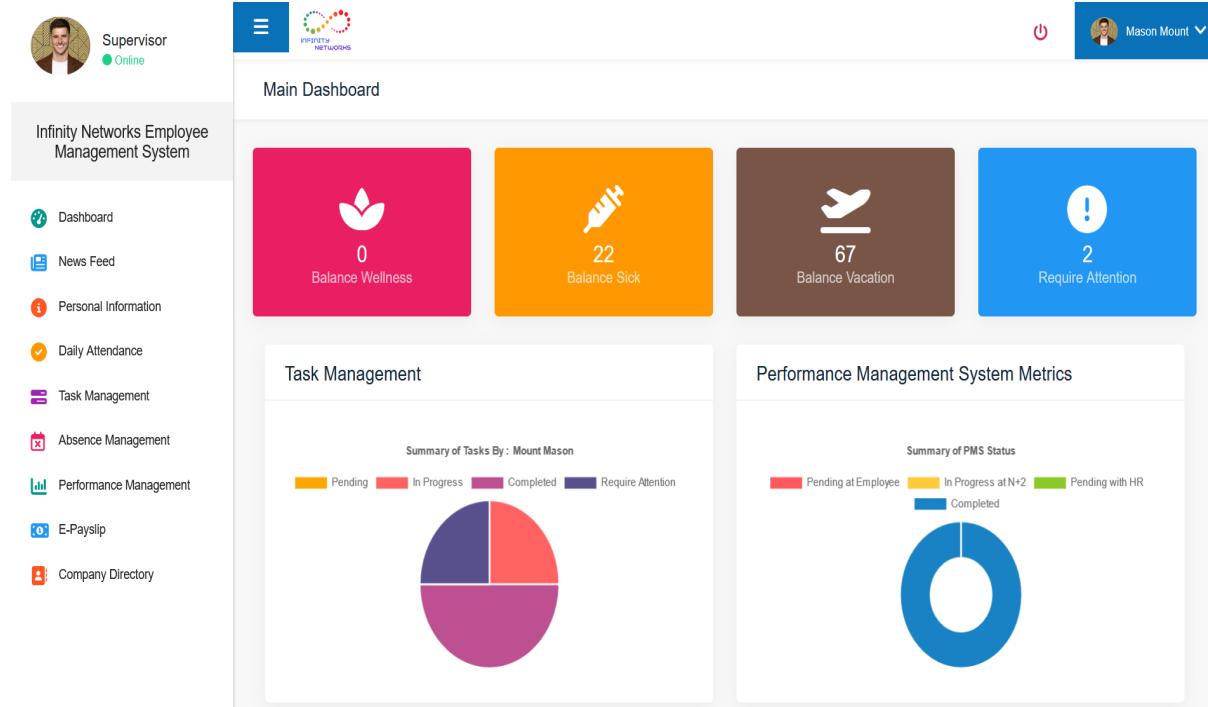


Figure 106: GUI Supervisor Dashboard Part 1

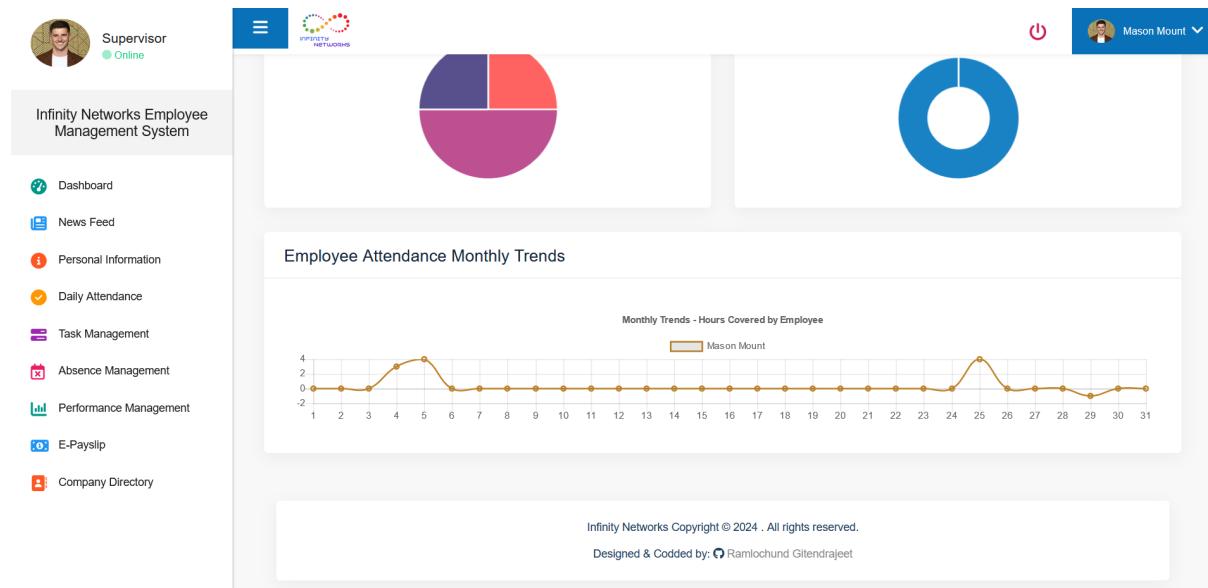


Figure 107: GUI Supervisor Dashboard Part 2

### 9.10.2 Wireframe News Feed

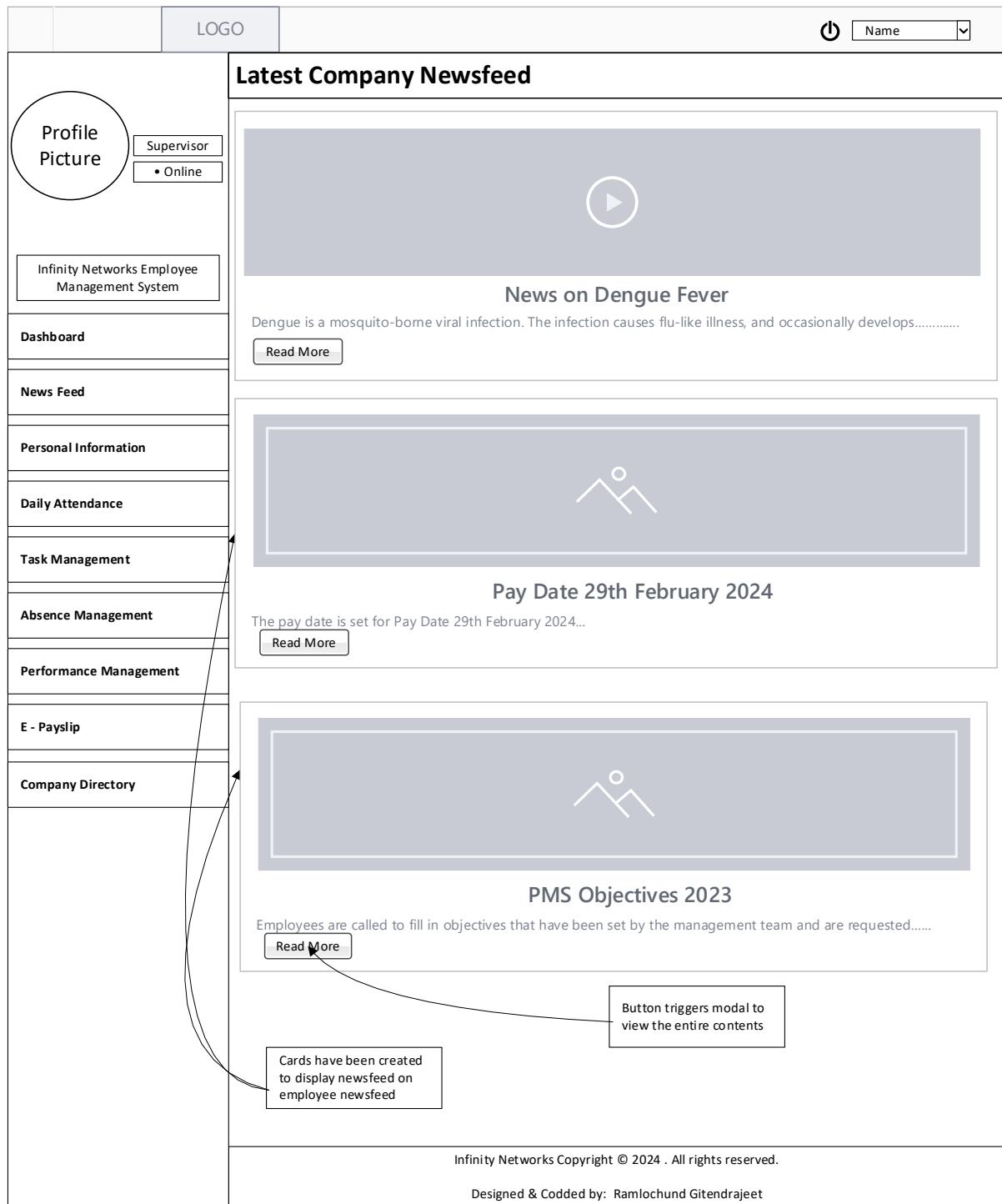


Figure 108: Wireframe News Feed

**9.10.2.1 GUI News Feed**

The screenshot shows a news feed titled "Latest Company Newsfeed". On the left is a sidebar with a user profile, the system name "Infinity Networks Employee Management System", and a list of menu items: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main content area displays a news article with the title "Precautions You Must Take To Prevent Dengue". It features an illustration of a mosquito and four circular icons with checkmarks or crosses. Below the title is a section titled "News on Dengue Fever" with a brief description: "Dengue is a mosquito-borne viral infection. The infection causes flu-like illness, and occasionally develops into a potentially lethal complication called severe dengue. The global incidence of dengue has grown dramatically in recent decades. About h...". A blue "Read More" button is at the bottom.

Figure 109:GUI News Feed Part 1

The screenshot shows a news feed titled "Latest Company Newsfeed". The sidebar is identical to Figure 109. The main content area displays two news articles. The top article is titled "INTERNAL COMMUNICATION SALARY PAYDATE" with a sub-section "Salary Pay Date - September 2023". It includes a "Read More" button and a timestamp "Posted on: 2023-09-01 10:13:30". The bottom article is titled "INTERNAL COMMUNICATION PMS Objectives are now open" and includes a "TOP" button. Both articles feature the company logo "INFINITY NETWORKS" and a stylized building graphic.

Figure 110:GUI News Feed Part 2

### 9.10.3 Wireframe Supervisor Profile

The wireframe illustrates the layout of the Supervisor Profile page. On the left is a vertical sidebar with a navigation menu:

- Profile Picture (with status: Supervisor • Online)
- Infinity Networks Employee Management System
- Dashboard
- News Feed
- Personal Information
- Daily Attendance
- Task Management
- Absence Management
- Performance Management
- E - Payslip
- Company Directory

The main content area is titled "Profile" and displays "Mason Mount's Profile". It features a large photo of Mason Mount, his title "Manager", and a service tenure indicator "Currently : 4.7 years in Service". Below this, there is a section for "Personal Details" with fields for Department, Date Joined Company, Email Address, Work Phone Number, Mobile Number, Residential Address, Emergency Contact Person, Emergency Contact Number, and Highest Educational Qualification. A callout notes that the system automatically calculates years in service based on the date joined company. At the bottom of the main content area, there is a "Change Password" button, which is highlighted with a blue arrow and a callout stating "Button triggers modal to change password". The footer contains copyright information and credits to the designer.

Figure 111:Wireframe Supervisor Profile

### 9.10.3.1 GUI Supervisor Profile

The screenshot shows a web-based employee management system interface. At the top left is a user profile icon for 'Supervisor' (Mason Mount) with the status 'Online'. The top right features a power button icon and a dropdown menu for 'Mason Mount'. The main header reads 'Mason Mount's Profile'. Below the header is a large thumbnail image of a smiling man (Mason Mount). To the right of the image, the name 'Mason Mount' is displayed, followed by 'About: Manager' and 'Currently : 4.7 years in Service'. On the left side, there is a sidebar with the title 'Infinity Networks Employee Management System' and a navigation menu containing links for Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The central area contains a section titled 'Personal Details' with fields for Department (Business), Date Joined Company (2020-06-24), Email Address (test2@test.com), Work Phone Number (2010003), Mobile Number (57770711), National Identity Card Number (M2806710101A), Residential Address (Streetford End, GB), Emergency Contact Person (Tammy Mount), Emergency Contact Number (2632207), and Highest Educational Qualification (MBA in Business Administration). A 'Change Password' button is located at the bottom of this section. At the very bottom of the page, there is a copyright notice: 'Infinity Networks Copyright © 2024. All rights reserved.' and 'Designed & Codded by Ramlochund Gitendrajeet'.

Figure 112:GUI Supervisor Profile

A modal dialog box titled 'CHANGE PASSWORD' is shown. It contains two input fields: 'New Password' and 'Confirm Password', both represented by large, empty rectangular boxes. Below these fields is a blue 'Submit' button. The background of the dialog box has a subtle wood-grain texture.

Figure 113:GUI Change Password

### 9.10.4 Wireframe Supervisor Daily Attendance

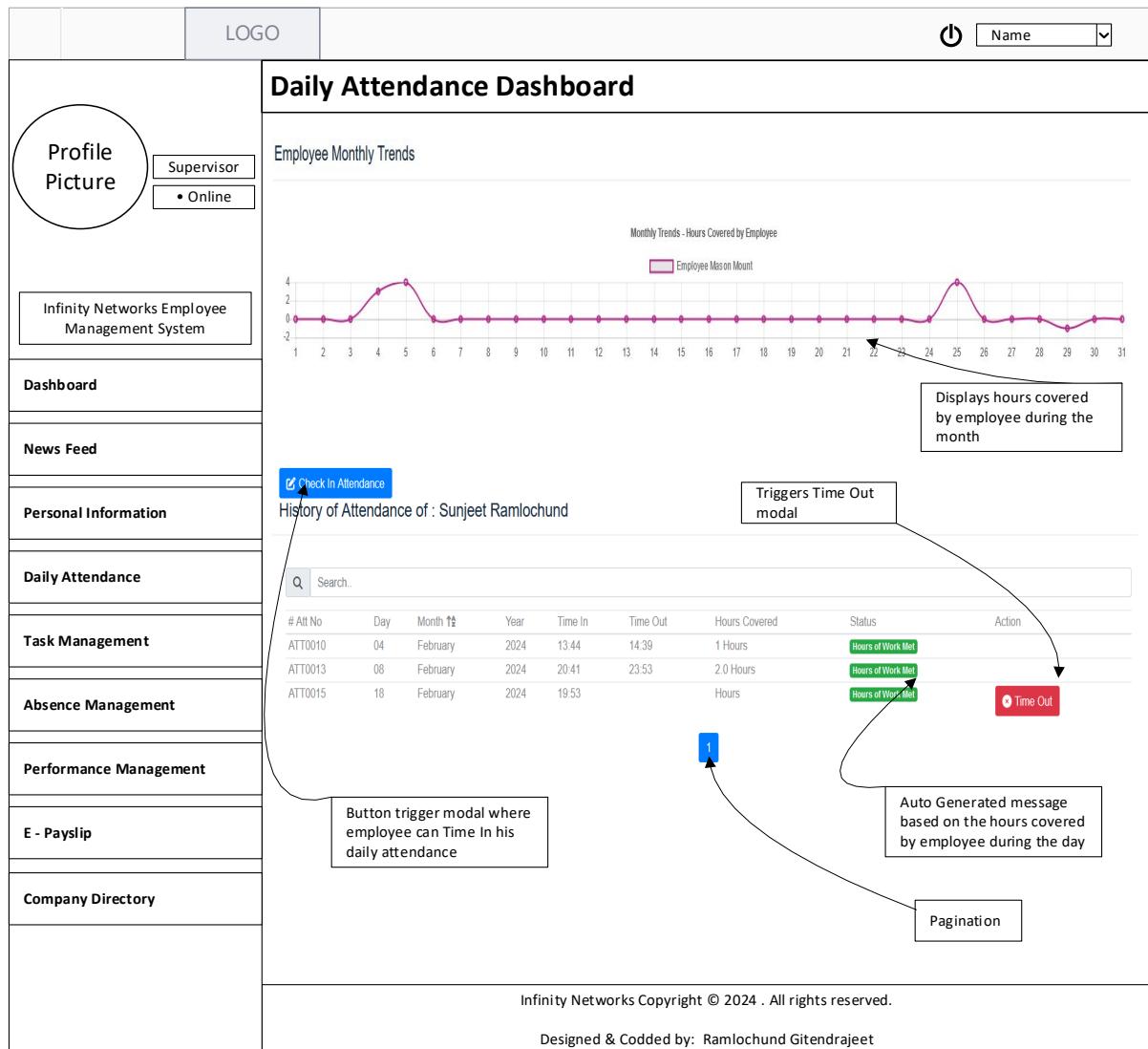


Figure 114: Wireframe Daily Attendance

### 9.10.4.1 GUI Supervisor Daily Attendance

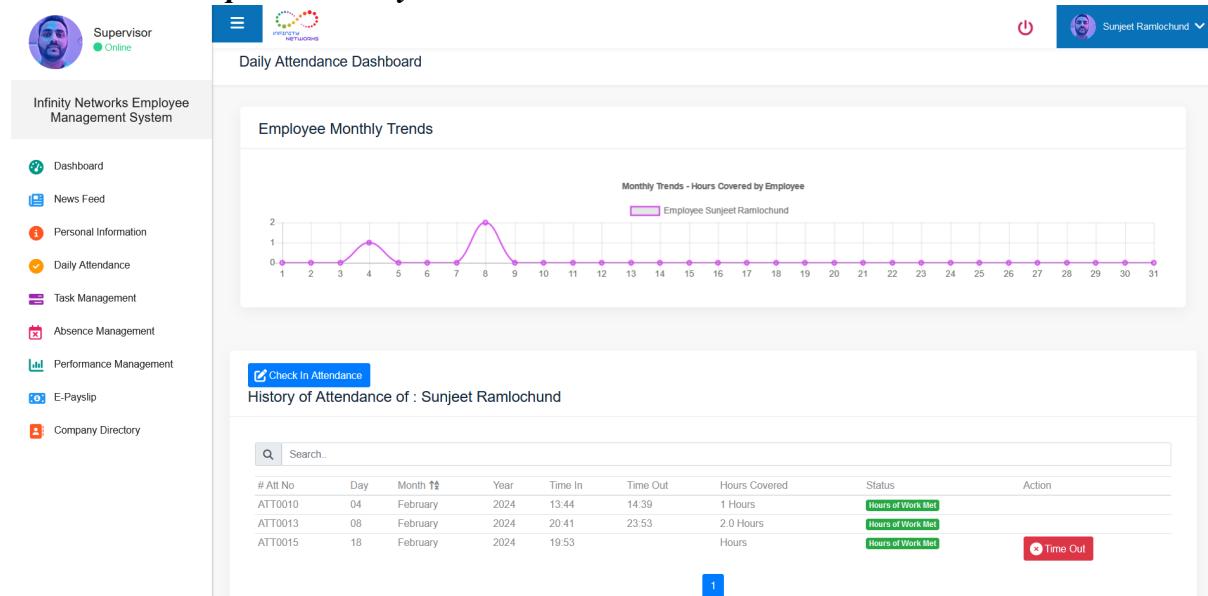


Figure 115:GUI Attendance Part 1

### 9.10.4.2 GUI Attendance Time In

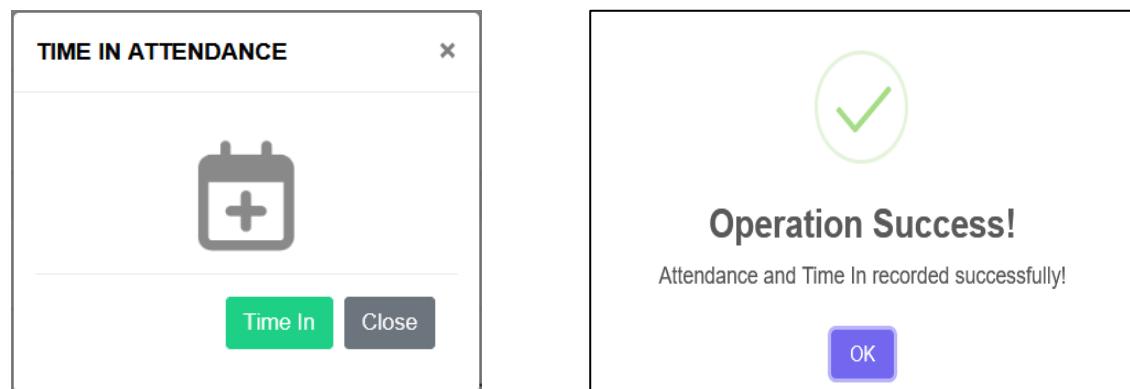


Figure 116: GUI Attendance Part 2

### 9.10.4.3 GUI Attendance Time Out

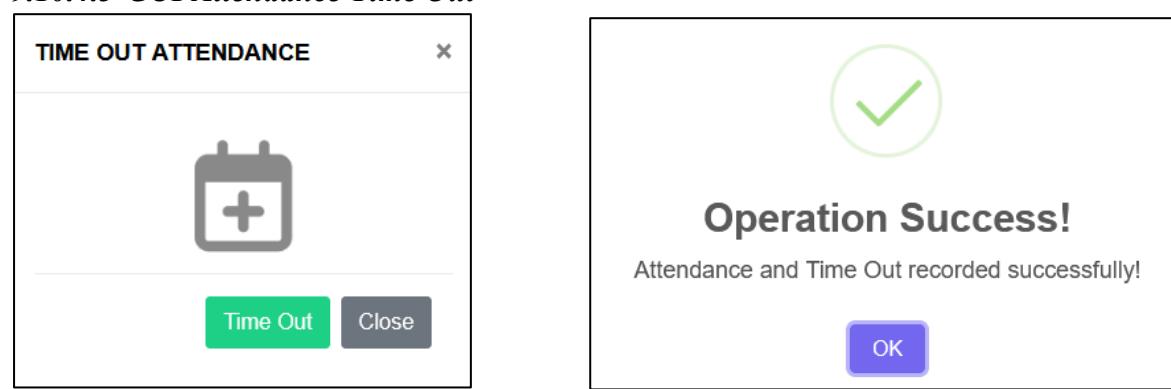


Figure 117:GUI Attendance Time Out

### 9.10.5 Wireframe Task Management Dashboard

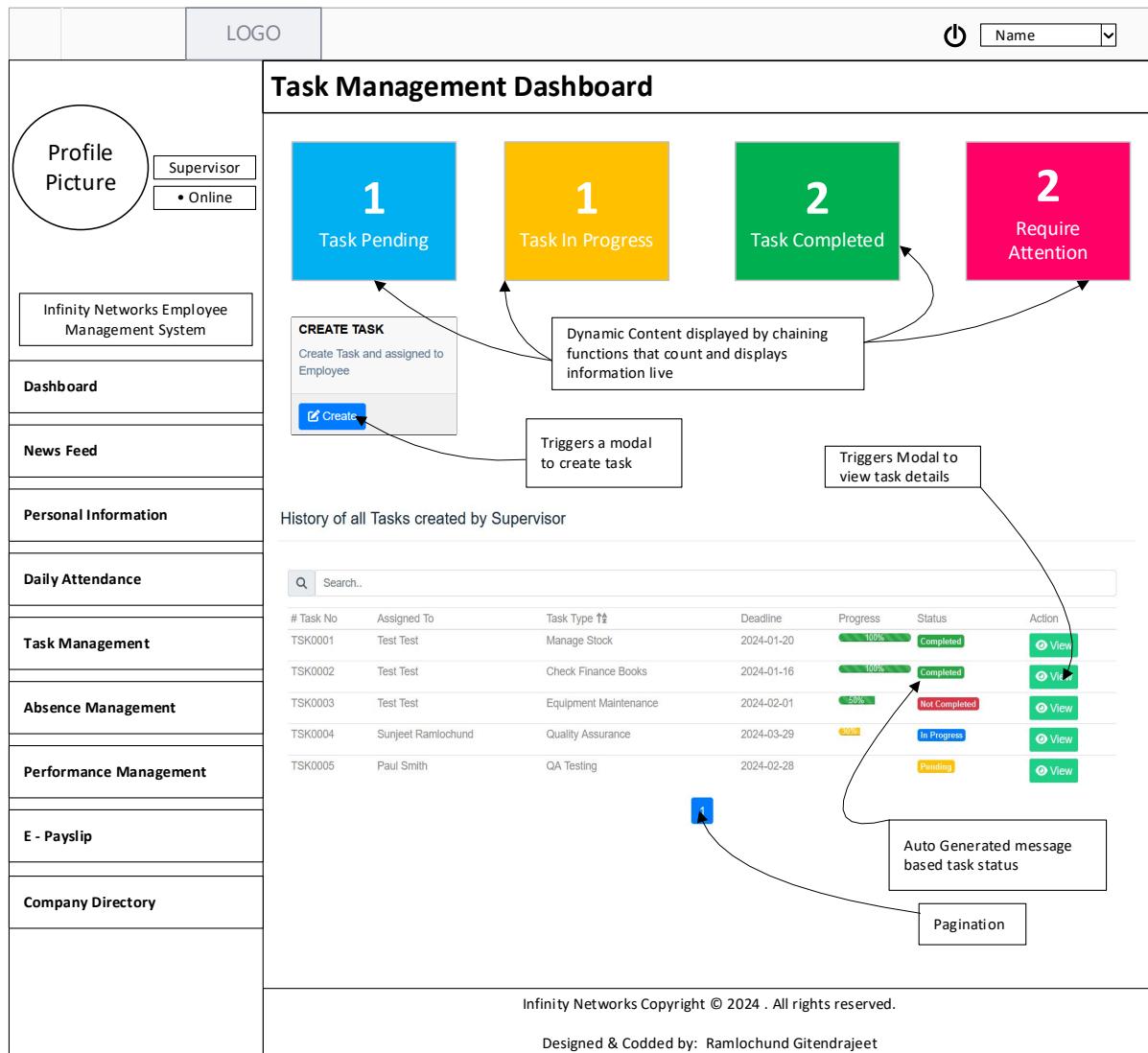


Figure 118: Wireframe Task Management

In this system, supervisors hold exclusive rights for CRUD operations, ensuring efficient task management. Supervisors initiate tasks, detailing their descriptions and deadlines. They then assign these tasks to employees under their supervision. Employees, in turn, interact with assigned tasks, updating statuses and providing feedback. With supervisors overseeing task progress and the system facilitating communication, this component optimizes departmental productivity and collaboration.

### 9.10.5.1 GUI Task Management Dashboard

The screenshot shows the Infinity Networks Employee Management System dashboard. On the left, a sidebar lists various management modules: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management (selected), Absence Management, Performance Management, E-Payslip, and Company Directory. The main area displays four summary cards: Task Pending (1), Task In Progress (1), Task Completed (2), and Require Attention (1). Below these is a 'CREATE TASK' button with the sub-instruction 'Create Task and assigned to Employee'. A table titled 'History of all Tasks created by Supervisor' lists five tasks with columns for Task No, Assigned To, Task Type, Deadline, Progress, Status, and Action.

# Task No	Assigned To	Task Type	Deadline	Progress	Status	Action
TSK0001	Test Test	Manage Stock	2024-01-20	<div style="width: 100%;">100%</div>	Completed	<button>View</button>
TSK0002	Test Test	Check Finance Books	2024-01-16	<div style="width: 100%;">100%</div>	Completed	<button>View</button>
TSK0003	Test Test	Equipment Maintenance	2024-02-01	<div style="width: 50%; background-color: #007bff;">50%</div>	Not Completed	<button>View</button>
TSK0004	Sunjeet Ramlochund	Quality Assurance	2024-03-29	<div style="width: 25%; background-color: #ffc107;">25%</div>	In Progress	<button>View</button>
TSK0005	Paul Smith	QA Testing	2024-02-28	<div style="width: 0%; background-color: #ffc107;">0%</div>	Pending	<button>View</button>

Figure 119: GUI Task Management Dashboard

### 9.10.5.2 GUI Create a Task and Assign to Employee

The dialog box is titled 'CREATE TASK AND ASSIGN TO EMPLOYEE'. It contains fields for 'Task Name' (with a text input field), 'Task Description' (with a text input field), 'Set Deadline' (with a date input field), and 'Assign To' (with a dropdown menu showing 'Paul Smith'). At the bottom are 'Create Task' and 'Close' buttons.

Figure 120: GUI Create Task

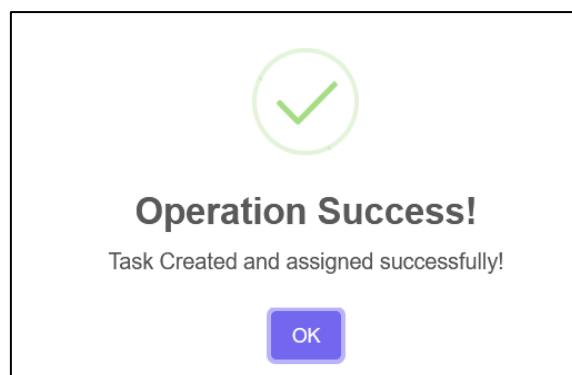


Figure 121: GUI Success Message for Task Creation

### 9.10.6 Wireframe Supervisor Absence Management

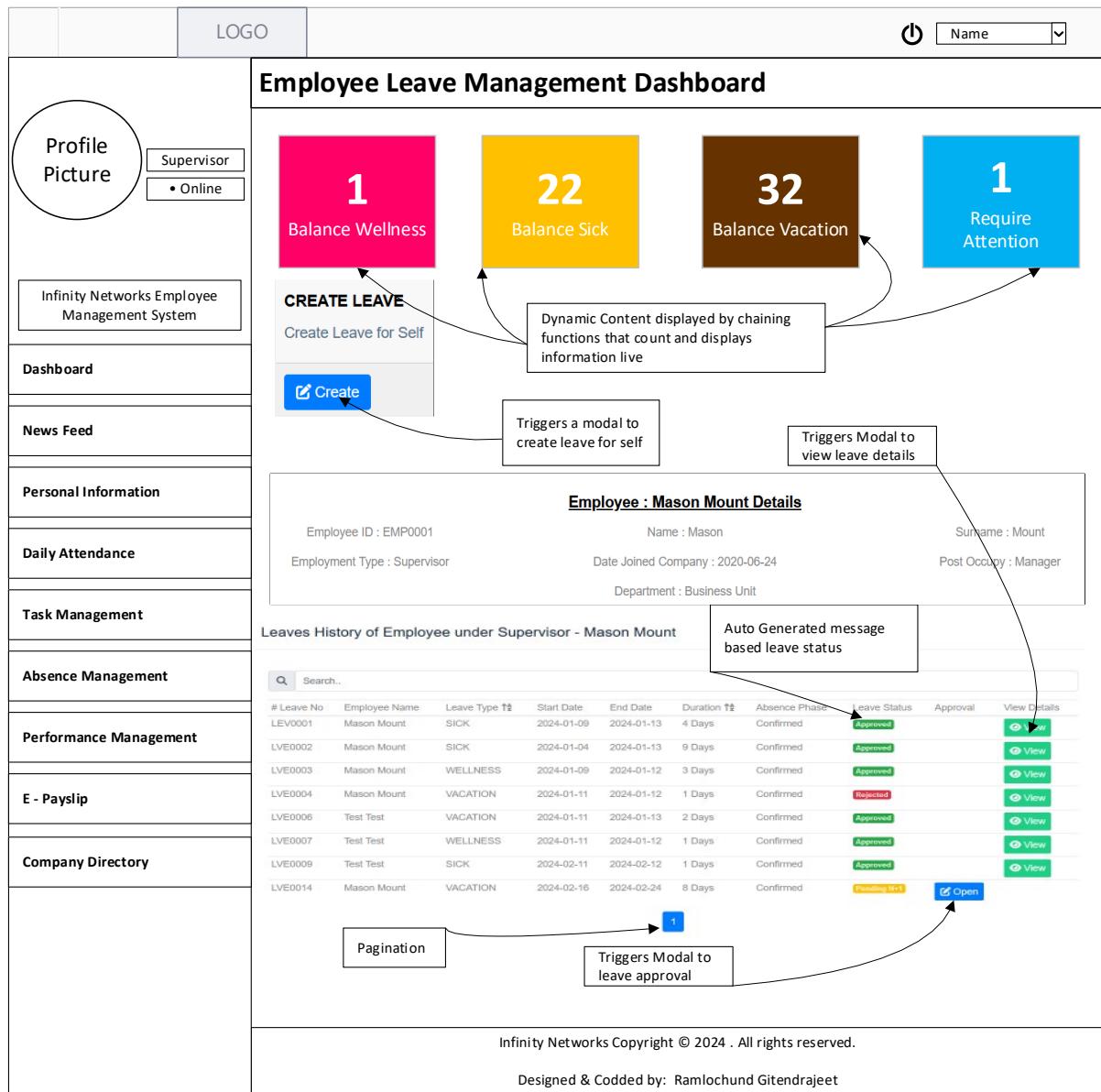


Figure 122:Wireframe Absence Management

### 9.10.6.1 GUI Supervisor Absence Management

The screenshot shows the 'Employee Leave Management Dashboard' for 'Infinity Networks Employee Management System'. It features a sidebar with navigation links for Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main area displays four summary cards: Balance Wellness (0), Balance Sick (22), Balance Vacation (67), and a warning for 1 require attention. A 'CREATE LEAVE' button is visible. Below this, the 'Employee : Mason Mount Details' section shows: Employee ID: EMP0001, Name: Mason, Employment Type: Supervisor, Date Joined Company: 2020-06-24, Post Occupy: Manager, and Department: Business Unit.

The screenshot shows the 'Leaves History of Employee under Supervisor - Mason Mount' page. It lists 14 leave entries with columns for Leave No, Employee Name, Leave Type, Start Date, End Date, Duration, Absence Phase, Leave Status, Approval, and View Details. The entries include various types like SICK, VACATION, and WELLNESS, with statuses ranging from Approved to Pending Review. At the bottom, it says 'Infinity Networks Copyright © 2024. All rights reserved.' and 'Designed & Codded by: Ramlochund Gitendrajeet'.

Figure 123: GUI Absence Management

### 9.10.6.2 GUI Create Leave

The screenshot shows the 'CREATE LEAVE FOR EMPLOYEE' dialog box. It includes fields for Leave Type (Sick Leave selected), Start Date (dd/mm/yyyy), End Date (dd/mm/yyyy), Total Leave Duration (Duration: 0 days), Leave Reason (a text input field), and two buttons at the bottom: 'Save Changes' (green) and 'Close' (grey).

Figure 124: GUI Create Leave

### 9.10.7 Wireframe Supervisor PMS Dashboard

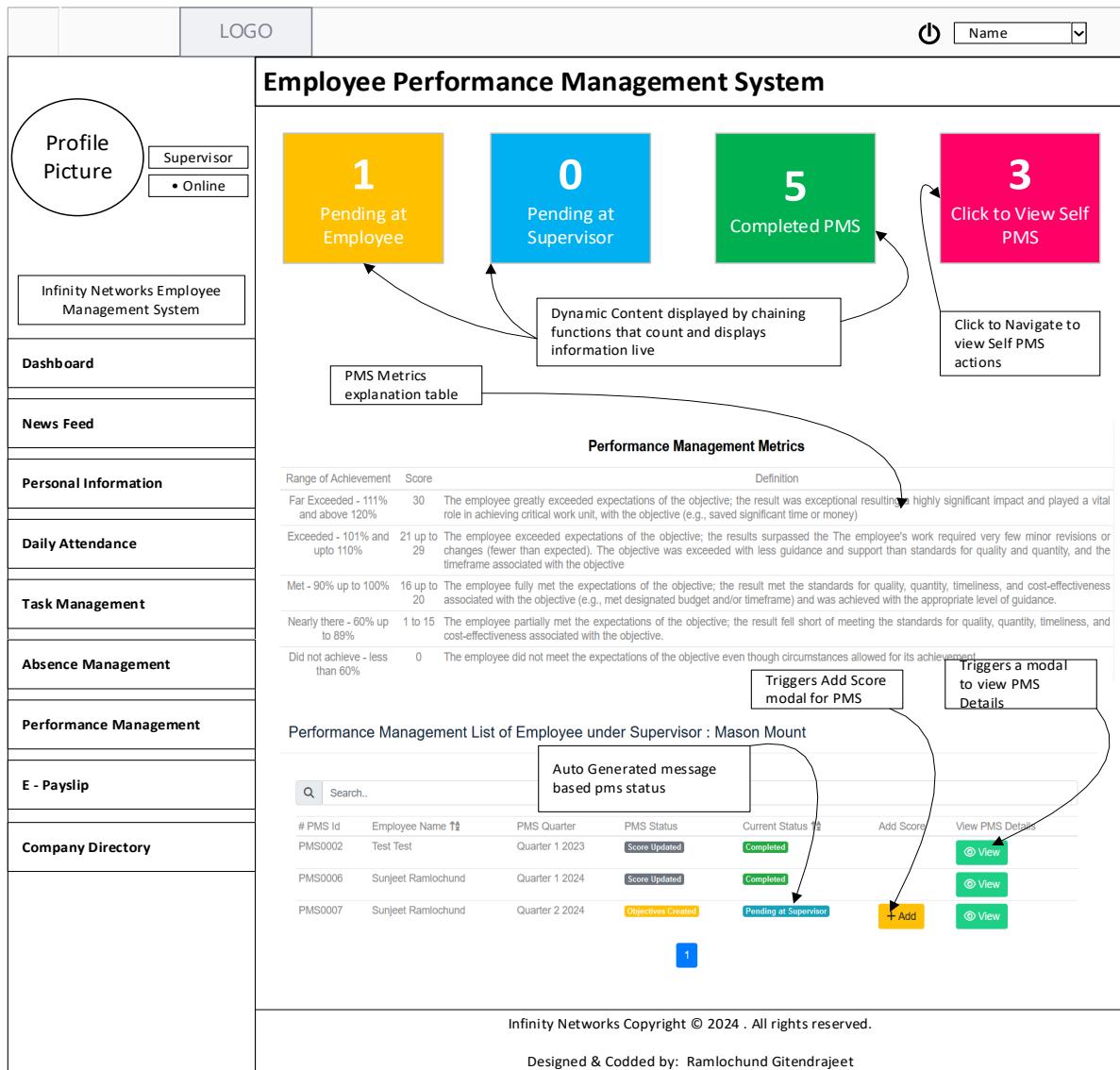


Figure 125:Wireframe Supervisor PMS Dashboard

#### 9.10.7.1 GUI Supervisor Self PMS List

The GUI screenshot shows the "Employee Performance Management System" header with a user profile for "Mason Mount". The left sidebar mirrors the wireframe's navigation options. The main content displays a table titled "Performance Management of Supervisor : Mason Mount" with the same three entries as the wireframe: PMS001 (Mason Mount, Quarter 1 2023, Score Updated, Completed), PMS004 (Mason Mount, Quarter 2 2023, Score Updated, Completed), and PMS005 (Mason Mount, Quarter 1 2024, Score Updated, Completed). Each row has a "View PMS Details" and "View" button. A footer at the bottom of the page also includes copyright and design credits.

Figure 126:GUI Supervisor Self PMS List

### 9.10.7.2 GUI Supervisor PMS Dashboard

The dashboard features a sidebar with a user profile (Supervisor, Online), the system name (Infinity Networks Employee Management System), and various menu items: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory.

The main area displays four summary cards:

- Pending at Employee:** 0
- Pending at Supervisor:** 0
- Completed PMS:** 5
- Click to View Self PMS:** 3

A section titled "Performance Management Metrics" provides a detailed table of achievement ranges:

Range of Achievement	Score	Definition
Far Exceeded - 111% and above 120%	30	The employee greatly exceeded expectations of the objective; the result was exceptional resulting a highly significant impact and played a vital role in achieving critical work unit, with the objective (e.g., saved significant time or money)
Exceeded - 101% and upto 110%	21 up to 29	The employee exceeded expectations of the objective; the results surpassed the The employee's work required very few minor revisions or changes (fewer than expected). The objective was exceeded with less guidance and support than standards for quality and quantity, and the timeframe associated with the objective
Met - 90% up to 100%	16 up to 20	The employee fully met the expectations of the objective; the result met the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective (e.g., met designated budget and/or timeframe) and was achieved with the appropriate level of guidance.
Nearly there - 60% up to 89%	1 to 15	The employee partially met the expectations of the objective; the result fell short of meeting the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective.
Did not achieve - less than 60%	0	The employee did not meet the expectations of the objective even though circumstances allowed for its achievement

Figure 127:GUI Supervisor PMS Dashboard Part 1

The sidebar and menu items are identical to Part 1.

The main area displays a table titled "Performance Management List of Employee under Supervisor : Mason Mount". The table includes columns: # PMS Id, Employee Name, PMS Quarter, PMS Status, Current Status, Add Score, and View PMS Details.

# PMS Id	Employee Name	PMS Quarter	PMS Status	Current Status	Add Score	View PMS Details
PMS0002	Test Test	Quarter 1 2023	Score Updated	Completed		<button>View</button>
PMS0006	Sunjeet Ramlochund	Quarter 1 2024	Score Updated	Completed		<button>View</button>
PMS0007	Sunjeet Ramlochund	Quarter 2 2024	Objectives Created	Pending at Supervisor	<button>Add</button>	<button>View</button>

At the bottom, there is a footer with copyright information: "Infinity Networks Copyright © 2024 . All rights reserved." and "Designed & Codded by: Ramlochund Gitendrajeet".

Figure 128:GUI Supervisor PMS Dashboard Part 2

### 9.10.7.3 GUI Supervisor Add PMS Score for Employee PMS Evaluation

The screenshot shows a web-based application interface for managing employee performance. On the left is a sidebar with a user profile picture, 'Supervisor' role, and 'Online' status. Below this is a navigation menu with links: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main content area has a header 'Employee Performance Management System'. Below it is a section titled 'Performance Management System -Sunjeet Ramlochund Metrics' containing employee details: Employee ID: EMP0007, Name: Sunjeet, Surname: Ramlochund, Employment Type: Supervisor, Date Joined Company: 2023-03-24, Post Occupy: Software Engineer, Department: Business, PMS Quater: Quarter 2, and PMS Year: 2024. A table titled 'Objectives Details' lists KPIs across four categories: Financial, Process improvement, Service Delivery, and Quality Assurance, each with specific objectives and metrics. At the bottom right are 'Cancel' and 'Save Changes' buttons.

Figure 129: GUI Add PMS Score for Employee PMS Evaluation

### 9.10.7.4 GUI Supervisor View Employee PMS Evaluation

The screenshot shows a web-based application interface for viewing employee performance. The sidebar and main content area are similar to Figure 129, but the main content area now displays a summary of employee metrics. It shows the employee's ID, name, surname, employment type, date joined, post occupied, department, and PMS year. Below this, a section titled 'EMPLOYEE PMS SCORE:' shows a score of 19.75, and another section titled 'EMPLOYEE PMS RESULT:' shows the result as 'Met'. A table titled 'Objectives Details' provides a detailed breakdown of performance across various KPIs, showing objectives, key performance indicators, metrics, and scores.

Figure 130: GUI Supervisor View Employee PMS Evaluation

### 9.10.8 Wireframe E-Payslip Dashboard

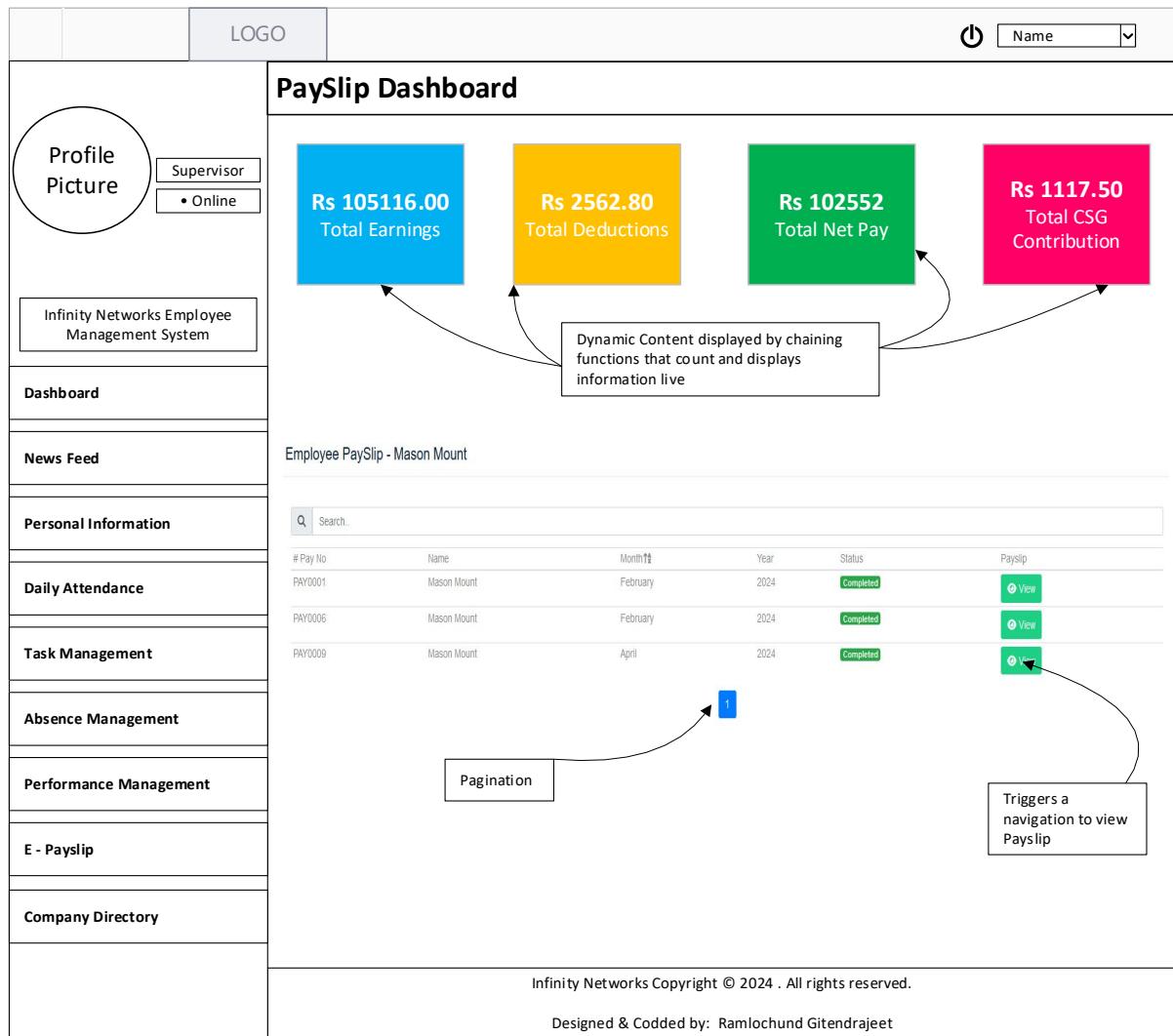


Figure 131: Wireframe E-Payslip Dashboard

#### 9.10.8.1 GUI E-Payslip Dashboard

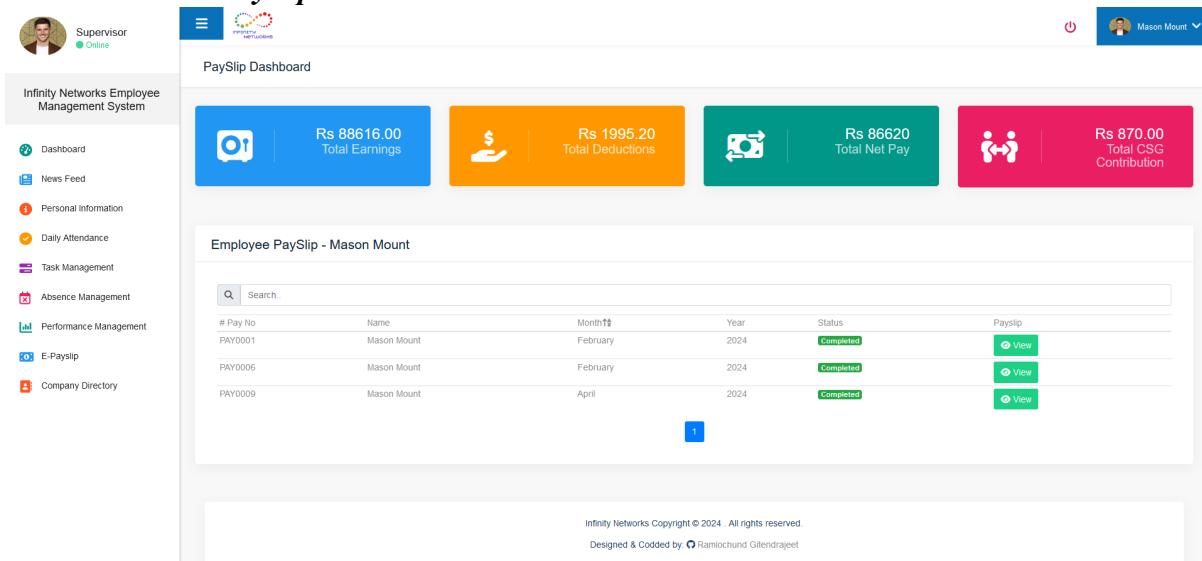


Figure 132: GUI E-Payslip Dashboard

### 9.10.8.2 GUI View Self Payslip

The screenshot shows the 'Infinity Networks Pay Slip' page. At the top, there's a header with the company logo and name. Below it is a table with employee details:

Employee ID : EMP0001	Name : Mason
Surname : Mount	Employment Type : Supervisor
Department : Business Unit	Post Occupy : Manager
Month : February	Year : 2024

Below the table is another table showing earnings and deductions:

Earnings	Amount(Rs)	Deductions	Amount(Rs)
Basic Salary	25000.00	Medical Contribution	250.00
Overtime	10500.00	CSG Contribution	375.00
Bus Fare	2456	NSF Contribution	235.00

At the bottom, there are summary totals:

Gross Pay(Rs)	Deductions(Rs)	Net Pay(Rs)
37956	860.00	37096

A blue 'Print Payslip' button is located at the bottom left. The footer contains copyright and design information.

Figure 133:GUI View Self Payslip

### 9.10.8.3 GUI Printing Options for Payslip

The screenshot shows a 'Print' dialog box over the payslip page. The dialog box has various settings for printing:

- Destination:** Adobe PDF
- Pages:** All
- Color mode:** Color
- Paper size:** Letter
- Scale:** Fit to page width
- Pages per sheet:** 1
- Margins:** Default
- Format:** Original
- Options:** Print headers and footers (checked), Print backgrounds (unchecked)

The 'Print' and 'Cancel' buttons are at the bottom right of the dialog box. The footer of the page also contains copyright and design information.

Figure 134:GUI Printing Options for Payslip

### 9.10.9 Wireframe Company Directory

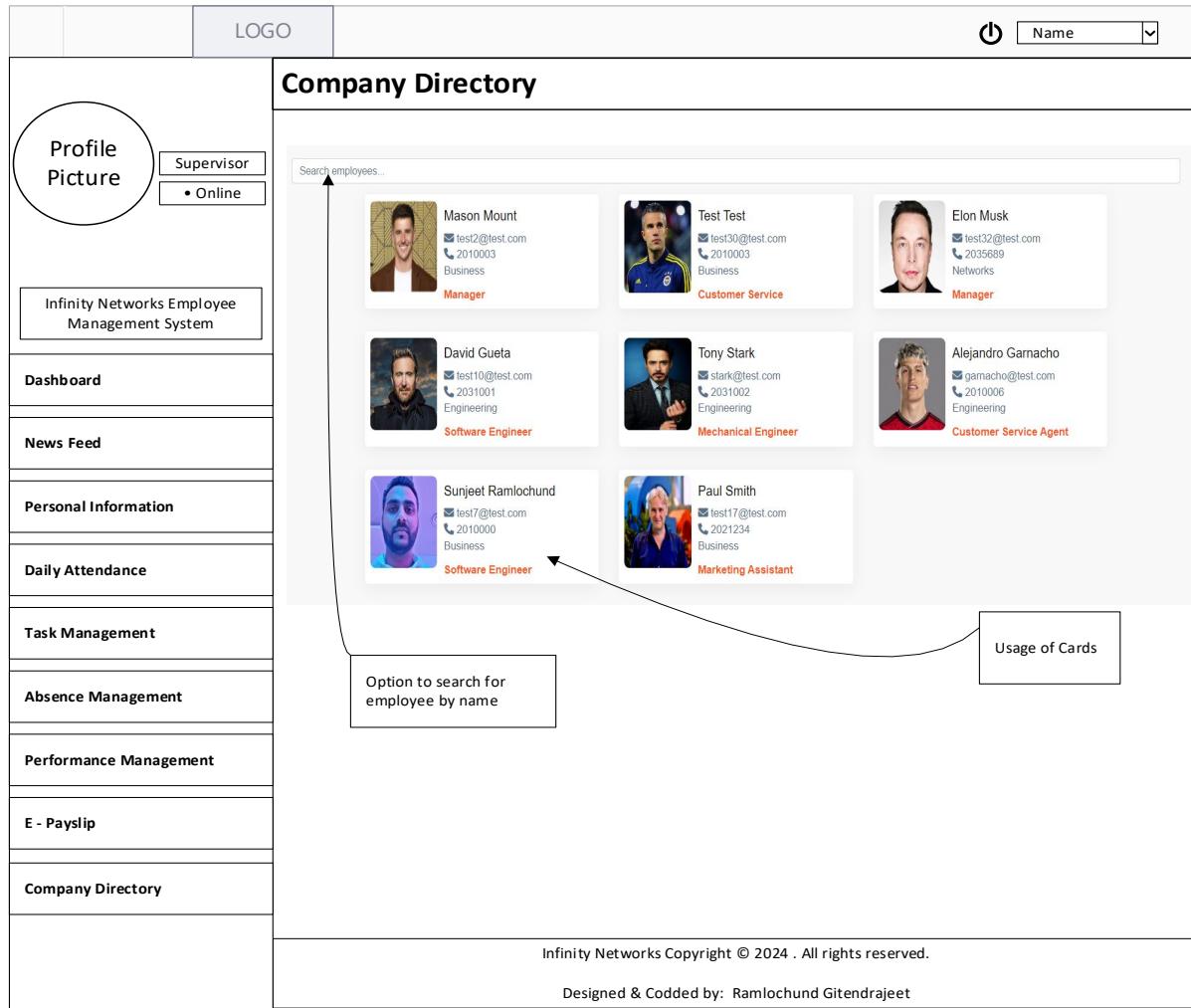


Figure 135: Wireframe Company Directory

#### 9.10.9.1 GUI Company Directory

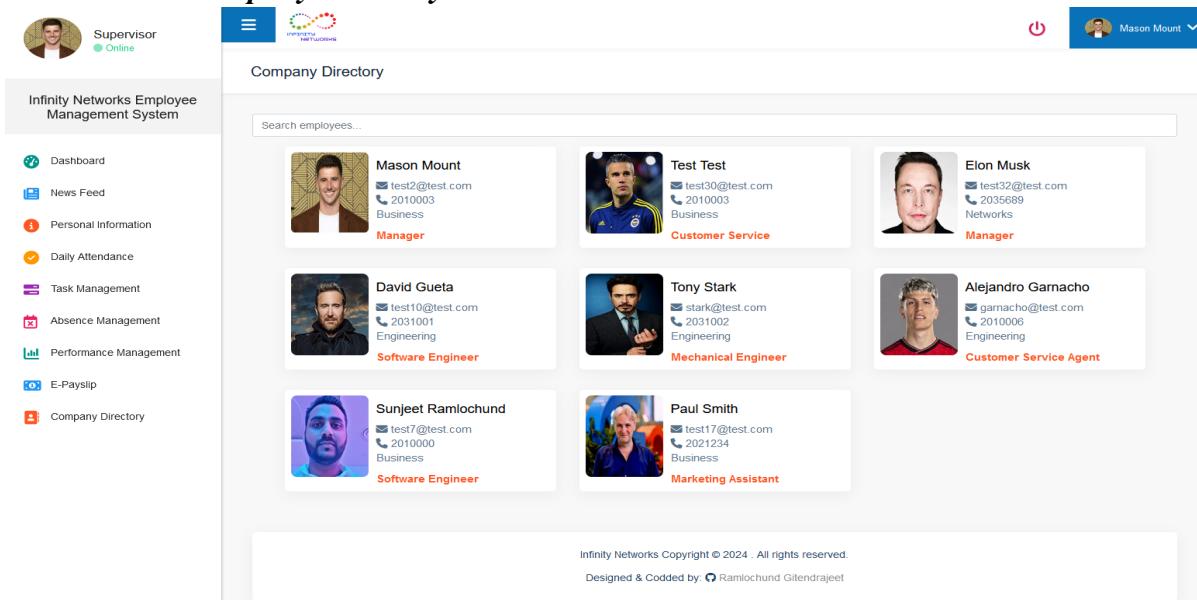


Figure 136: GUI Company Directory

## 9.11 WIREFRAME CASE: EMPLOYEE

### 9.11.1 Wireframe Employee Dashboard

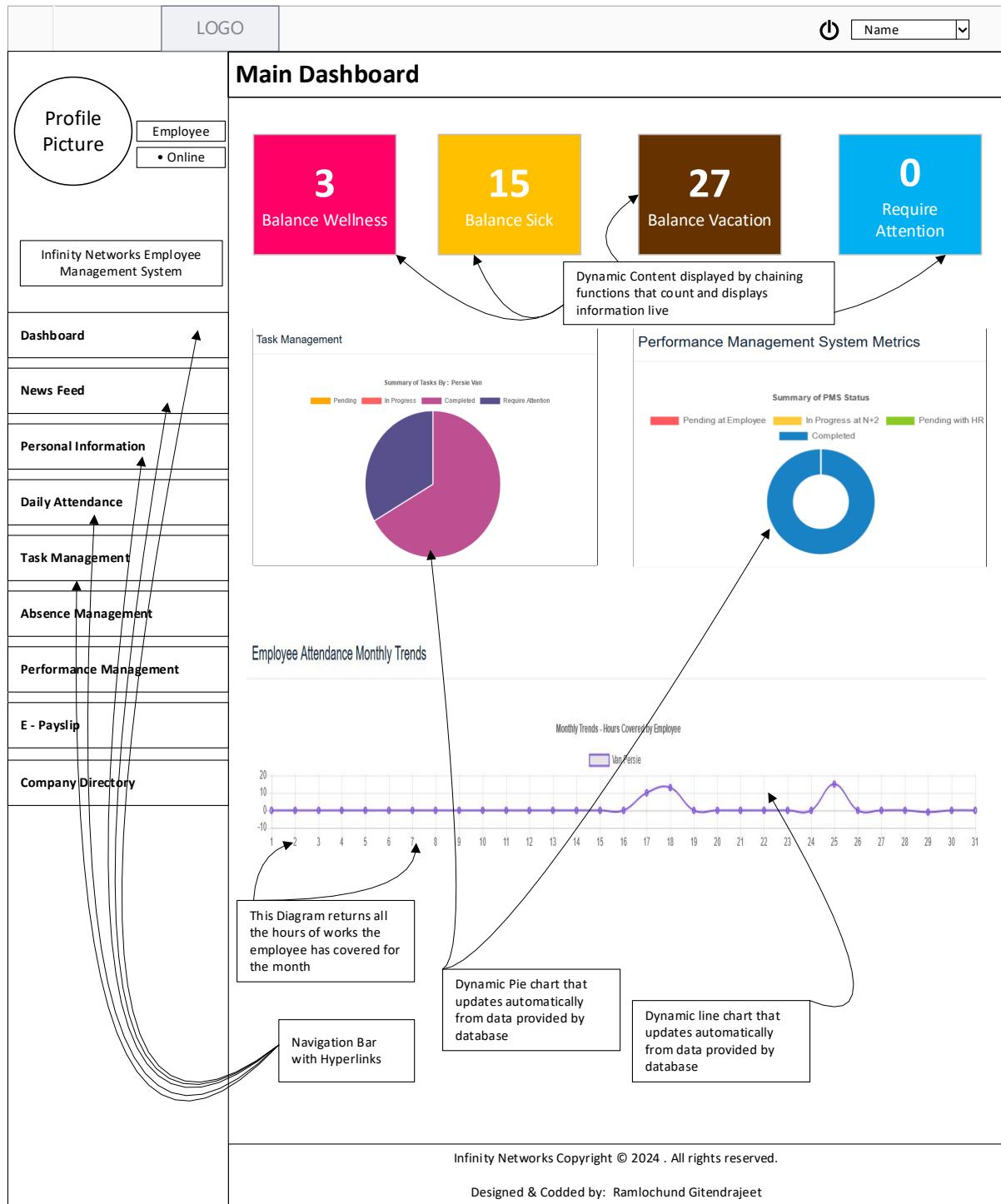


Figure 137: Wireframe Employee Dashboard

### 9.11.1.1 GUI Employee Dashboard

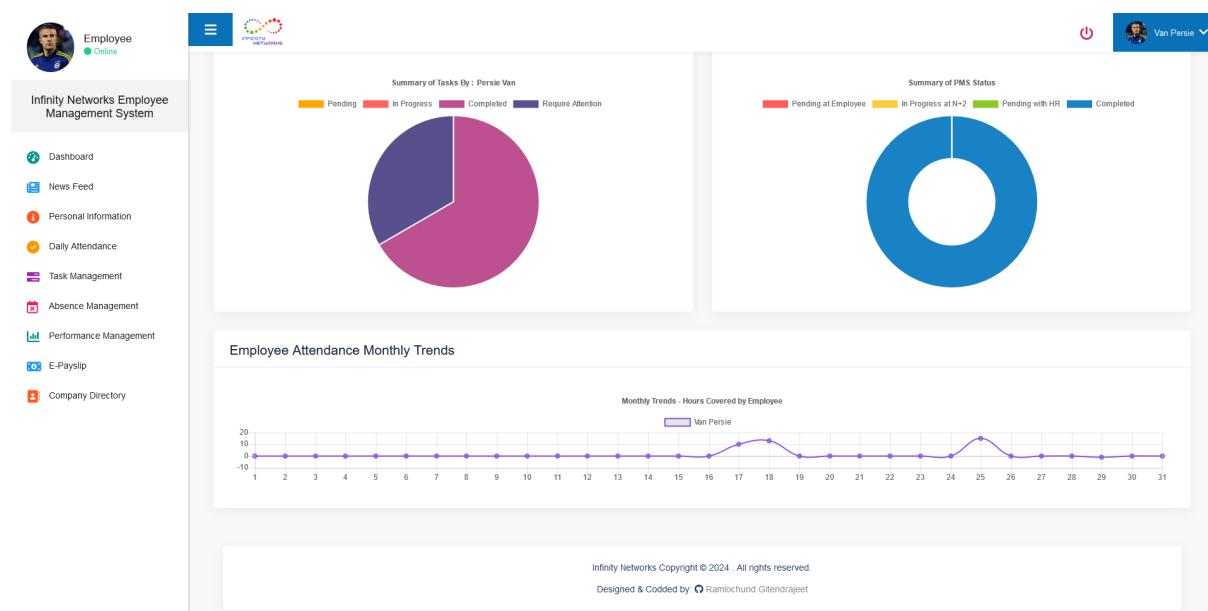
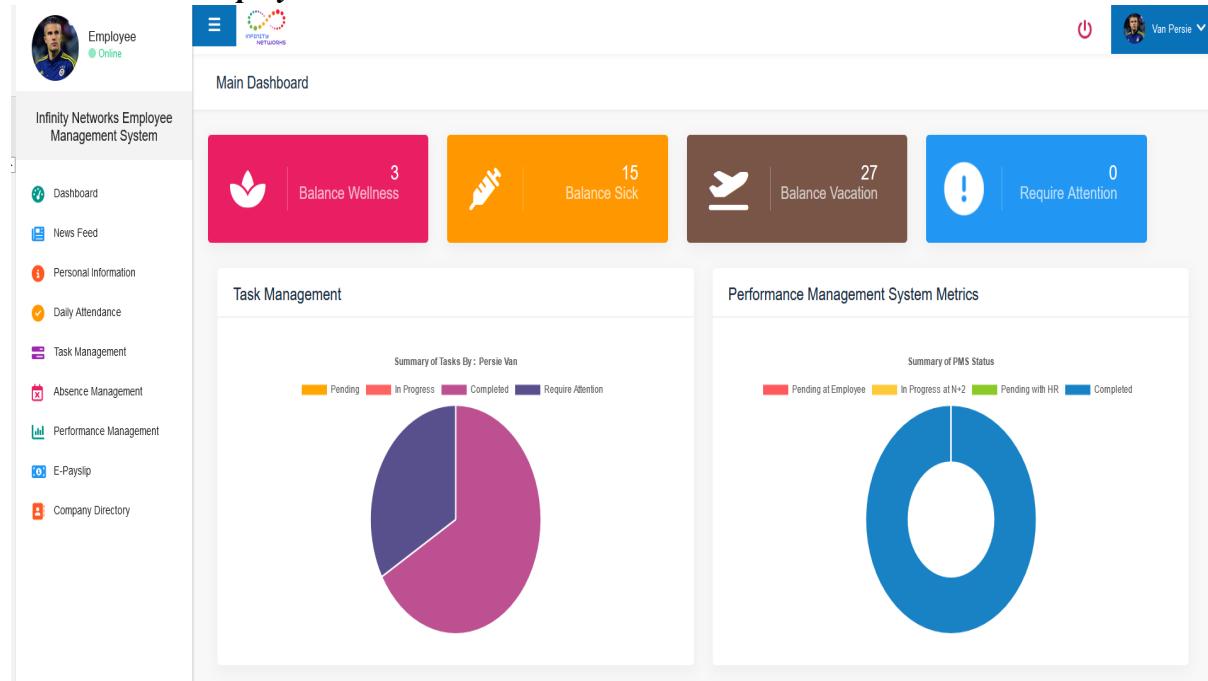


Figure 138:GUI Employee Dashboard

### 9.11.2 Wireframe Employee News Feed

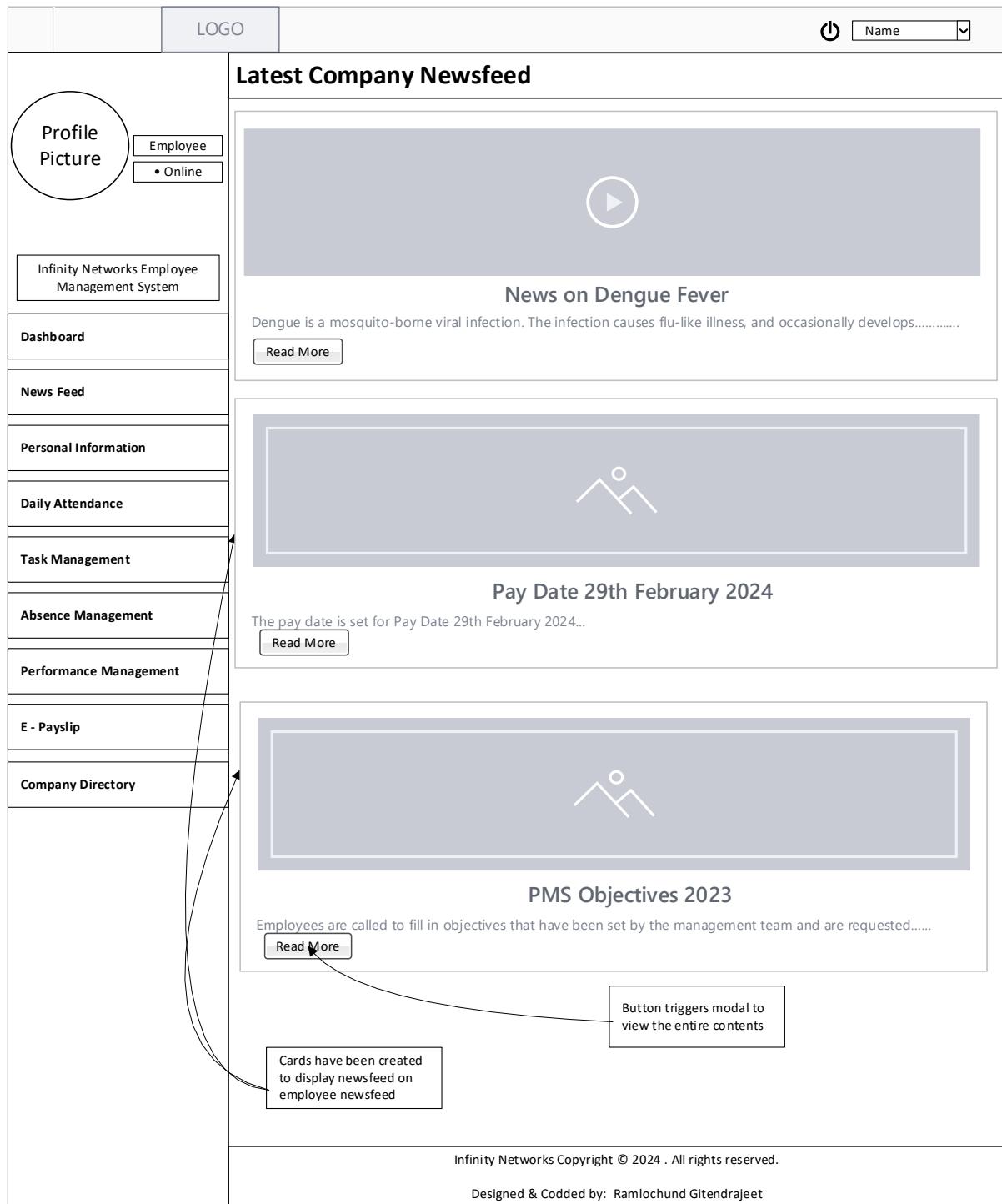


Figure 139: Wireframe Employee News Feed

### 9.11.2.1 GUI Employee News Feed

The screenshot displays a news feed from the Infinity Networks Employee Management System. At the top, there's a header bar with the system logo, user profile, and navigation links. Below the header, a news item is shown with the title "Latest Company Newsfeed". The main content of the news item is an article titled "Precautions You Must Take To Prevent Dengue". The article includes a large image of a mosquito and four circular icons with checkmarks or crosses, likely representing different preventive measures. The text in the article discusses the global incidence of dengue and provides some general information. A "Read More" button and a timestamp ("Posted on: 2024-02-15 22:57:47") are also visible.

Figure 140:GUI Employee News Feed Part 1

The screenshot displays a news feed from the Infinity Networks Employee Management System. At the top, there's a header bar with the system logo, user profile, and navigation links. Below the header, two news items are shown. The first news item has the title "INTERNAL COMMUNICATION SALARY PAYDATE" and the subtitle "Salary Pay Date - September 2023". It includes a small text snippet about the pay date being scheduled for Monday 28th August 2023. The second news item has the title "INTERNAL COMMUNICATION PMS Objectives are now open" and includes an illustration of a tablet screen showing a network of people. Both news items feature the Infinity Networks logo and a "Read More" button. Timestamps at the bottom right of each news item indicate they were posted on 2023-09-01 10:13:00.

Figure 141:GUI Employee News Feed Part 2

### 9.11.3 Wireframe Employee Profile

The wireframe illustrates the layout of the Employee Profile page. On the left is a vertical sidebar with a profile picture placeholder, the system name 'Infinity Networks Employee Management System', and various navigation links: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E - Payslip, and Company Directory. At the top right are a power icon and a dropdown menu for 'Name'. The main content area is titled 'Profile' and shows a placeholder for 'Van Persie's Profile' with a sample photo of a man in a blue and yellow tracksuit. Below the photo, the user's name 'Van Persie' is displayed along with their job title 'About: Customer Service' and service duration 'Currently : 7.4 years in Service'. A callout box notes that the system automatically calculates years in service based on the date joined company. The 'Personal Details' section contains fields for department (Business), date joined (2016-10-03), email address (test30@test.com), work phone number (2010003), mobile number (57770003), national identity card number (T12354687954A), emergency contact person (James David), emergency contact number (2632207), residential address (1 Rocket Road, CA, Hawthorne), highest educational qualification (Certificate in Customer Relations), and emergency contact number (2632207). A 'Change Password' button is located at the bottom of the personal details section, with a callout box stating it triggers a modal for password changes.

Figure 142: Wireframe Employee Profile

#### 9.11.3.1 GUI Employee Profile

The GUI version of the Employee Profile page follows a similar structure to the wireframe. It includes a sidebar with a profile picture, the system name, and navigation links. The main profile section features a placeholder for 'Van Persie's Profile' with a sample photo of a man in a blue and yellow tracksuit. The user's name 'Van Persie', job title 'About: Customer Service', and service duration 'Currently : 7.4 years in Service' are displayed. The 'Personal Details' section contains the same fields as the wireframe, including department (Business), date joined (2016-10-03), email address (test30@test.com), work phone number (2010003), mobile number (57770003), national identity card number (T12354687954A), emergency contact person (James David), emergency contact number (2632207), residential address (1 Rocket Road, CA, Hawthorne), highest educational qualification (Certificate in Customer Relations), and emergency contact number (2632207). A 'Change Password' button is located at the bottom of the personal details section.

Figure 143: GUI Employee Profile

#### 9.11.4 Wireframe Employee Daily Attendance



Figure 144: Wireframe Employee Daily Attendance

#### 9.11.4.1 GUI Employee Daily Attendance

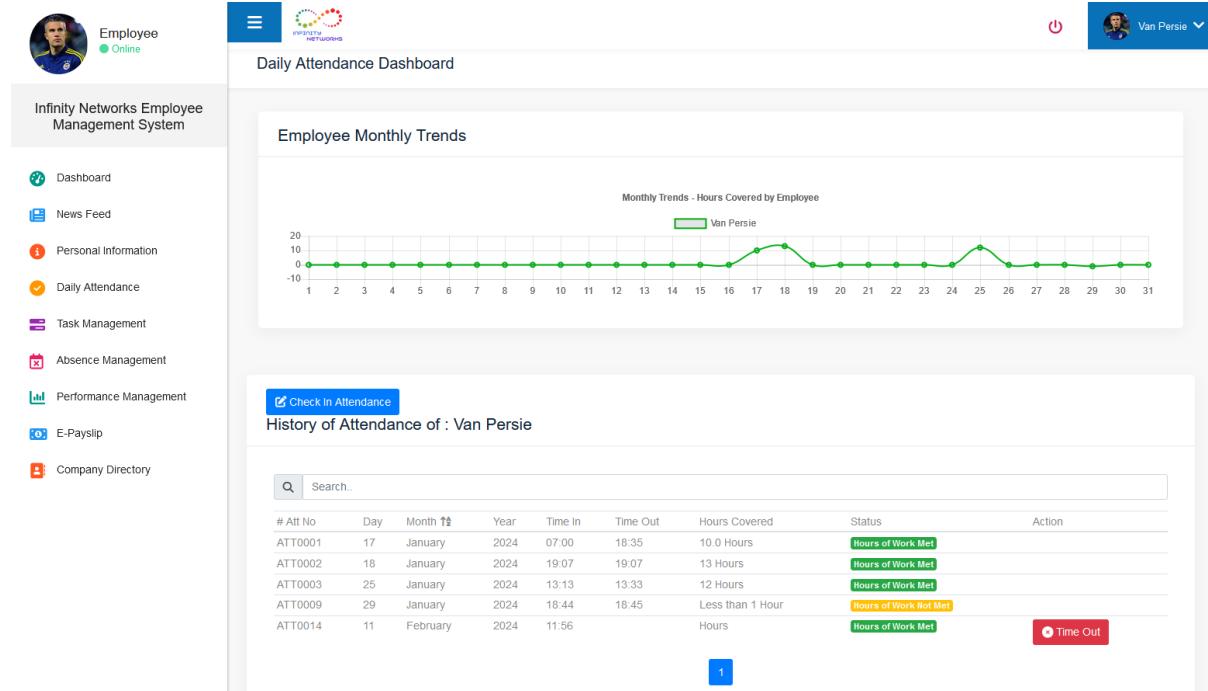


Figure 145: GUI Employee Daily Attendance

#### 9.11.4.2 GUI Attendance Time In

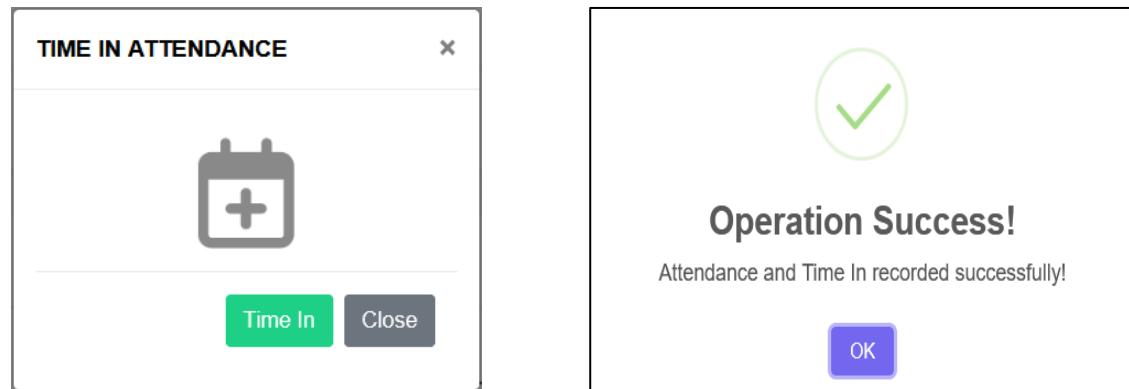


Figure 146: GUI Attendance Part 1

#### 9.11.4.3 GUI Attendance Time Out

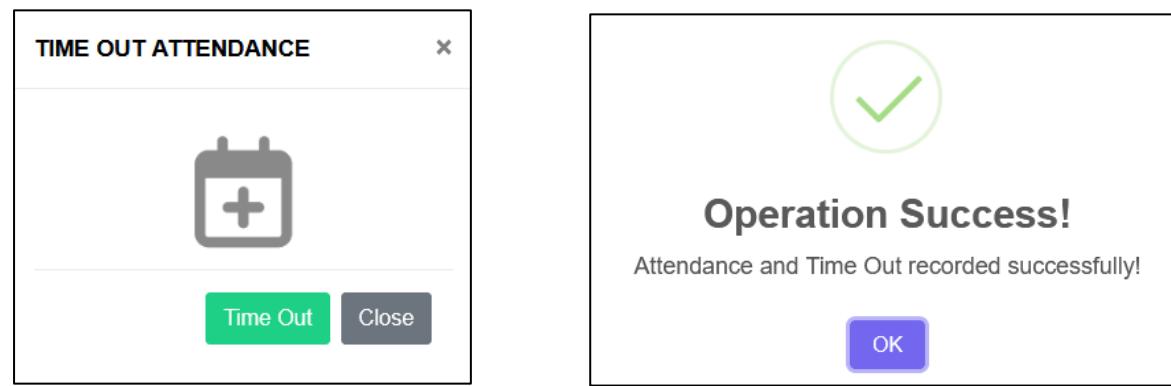


Figure 147: GUI Attendance Part 2

### 9.11.5 Wireframe Employee Task Management

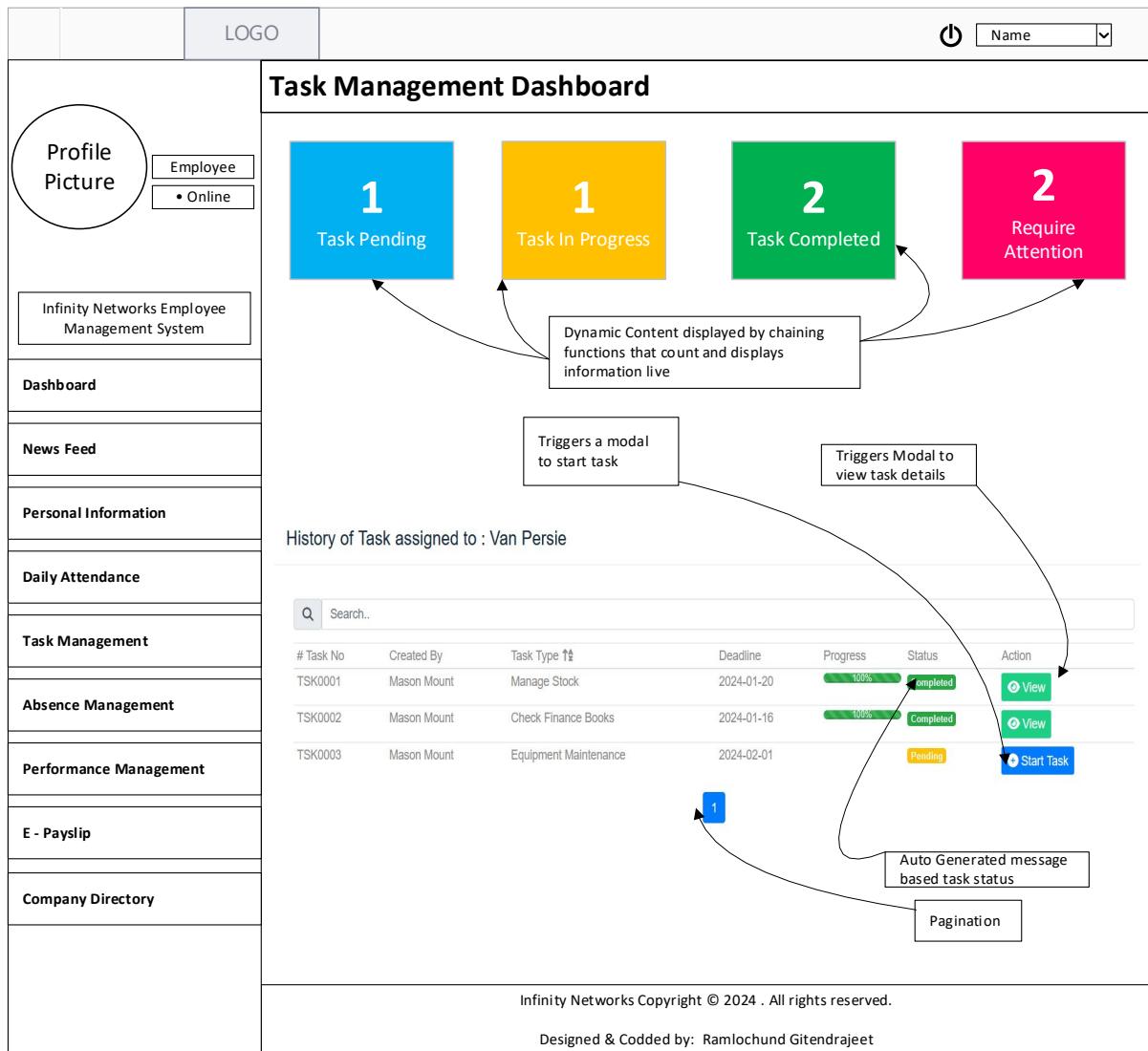


Figure 148:Wireframe Employee Task Management

### 9.11.5.1 GUI Employee Task Management

Infinity Networks Employee Management System

- Dashboard
- News Feed
- Personal Information
- Daily Attendance
- Task Management
- Absence Management
- Performance Management
- E-Payslip
- Company Directory

#	Task No	Created By	Task Type	Deadline	Progress	Status	Action
1	TSK0001	Mason Mount	Manage Stock	2024-01-20	<div style="width: 100%;">100%</div>	Completed	<button>View</button>
2	TSK0002	Mason Mount	Check Finance Books	2024-01-16	<div style="width: 100%;">100%</div>	Completed	<button>View</button>
3	TSK0003	Mason Mount	Equipment Maintenance	2024-02-01	<div style="width: 0%;">0%</div>	Pending	<button>Start Task</button>

Figure 149: GUI Employee Task Management

### 9.11.5.2 Employee Start Task

**START TASK**

**Task Name:** Equipment Maintenance

**Deadline Date:** 2024-02-01

**Operation Success!**

Task started successfully!

Figure 150: GUI Employee Start Task

### 9.11.5.3 Employee Close Task

**CLOSE TASK**

**Task Name:** Equipment Maintenance

**Deadline Date:** 2024-02-01

**Feedback :**  
Test Done!

**Work Status:**

**Operation Success!**

Task closed successfully!

Figure 151: GUI Employee Close Task

### 9.11.6 Wireframe Employee Leave Management

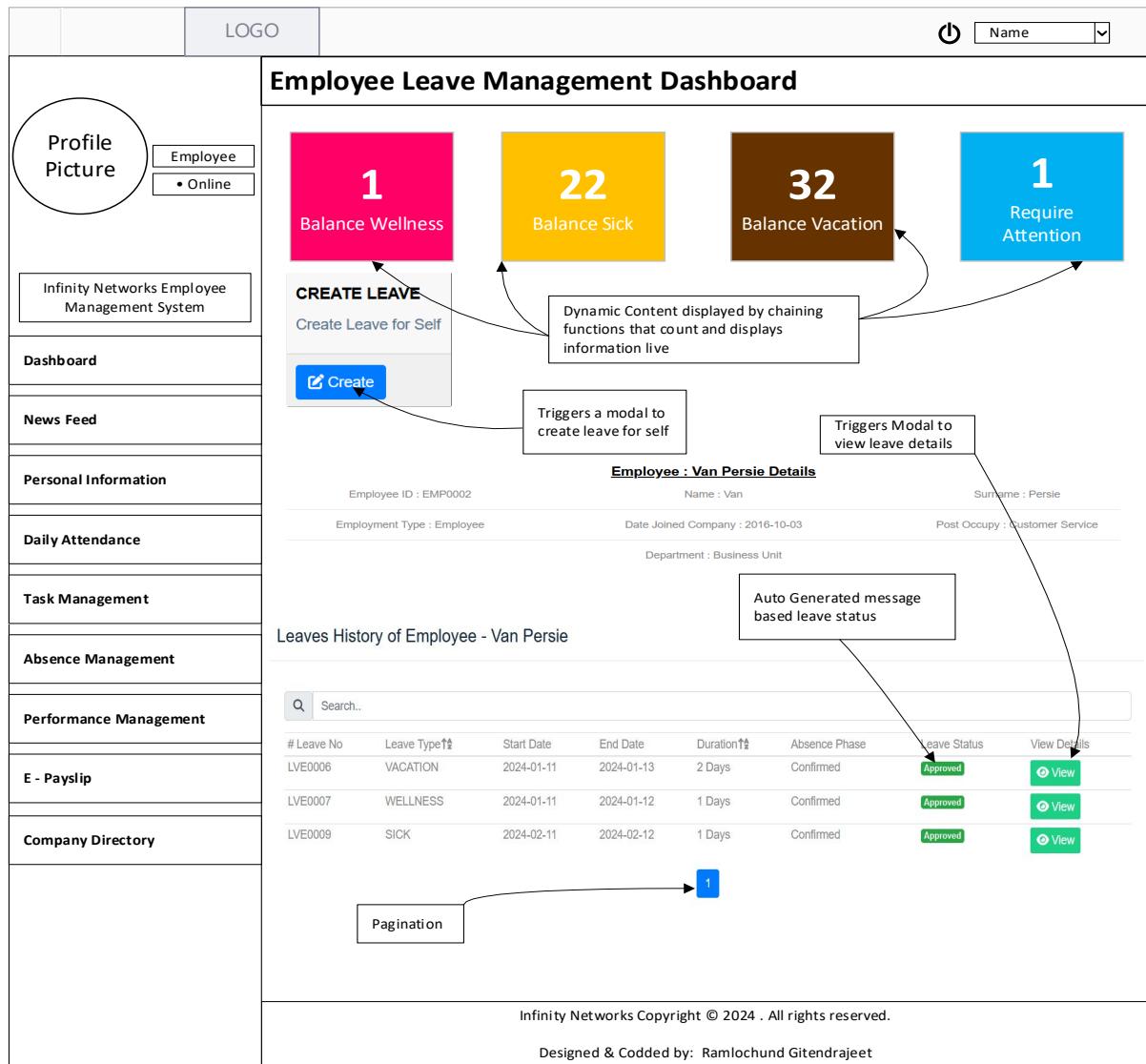


Figure 152:Wireframe Employee Leave Management

#### 9.11.6.1 GUI Employee Create Leave

The GUI for "CREATE LEAVE FOR EMPLOYEE" includes the following fields:

- Leave Type:** A dropdown menu currently set to "Sick Leave".
- Sick Leave Balance:** Shows a balance of 22.
- Select Start Date and End Date:** Two input fields for "Start Date" (dd / mm / yyyy) and "End Date" (dd / mm / yyyy).
- Total Leave Duration:** Displays "Duration: 0 days".
- Leave Reason:** A text input field.
- Buttons:** "Save Changes" (green) and "Close" (grey).

Figure 153:GUI Employee Create Leave

### 9.11.7 Wireframe Employee PMS Management

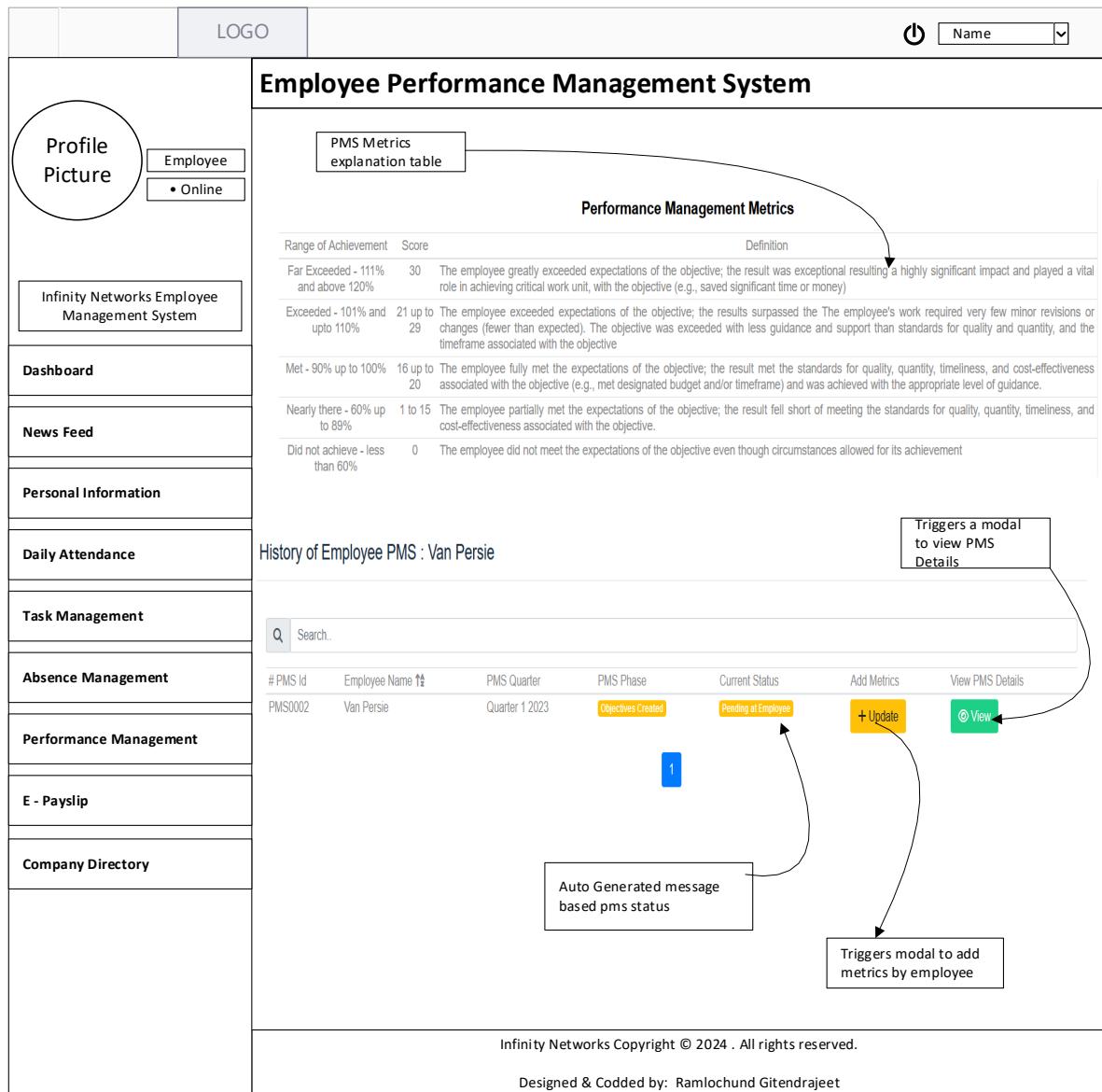


Figure 154:Wireframe Employee PMS Management

### 9.11.7.1 GUI Employee PMS Management

The screenshot displays the Employee Performance Management System interface. On the left, a sidebar lists various management functions: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main content area shows the 'Performance Management Metrics' table and the 'History of Employee PMS : Van Persie' section.

Range of Achievement	Score	Definition
Far Exceeded - 111% and above 120%	30	The employee greatly exceeded expectations of the objective, the result was exceptional resulting a highly significant impact and played a vital role in achieving critical work unit, with the objective (e.g., saved significant time or money)
Exceeded - 101% and upto 110%	21 up to 29	The employee exceeded expectations of the objective, the results surpassed the The employee's work required very few minor revisions or changes (fewer than expected). The objective was exceeded with less guidance and support than standards for quality and quantity, and the timeframe associated with the objective
Met - 90% up to 100%	16 up to 20	The employee fully met the expectations of the objective, the result met the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective (e.g., met designated budget and/or timeframe) and was achieved with the appropriate level of guidance.
Nearly there - 60% up to 89%	1 to 15	The employee partially met the expectations of the objective, the result fell short of meeting the standards for quality, quantity, timeliness, and cost-effectiveness associated with the objective.
Did not achieve - less than 60%	0	The employee did not meet the expectations of the objective even though circumstances allowed for its achievement

**History of Employee PMS : Van Persie**

Search bar: Q Search...

# PMS Id	Employee Name	PMS Quarter	PMS Phase	Current Status	Add Metrics	View PMS Details
PMS0002	Van Persie	Quarter 1 2023	Objectives Created	Pending at Employees	+ Update	@ View

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Designed & Coded by: @ Ramlochund Gilendrajeet

Figure 155:GUI Employee PMS Management

### 9.11.7.2 GUI Employee Add Metrics

The screenshot shows the 'Performance Management System -Van Persie Metrics' section. It displays employee details (Employee ID: EMP0002, Name: Van, Surname: Persie, Employment Type: Employee, Date Joined Company: 2016-10-03, Post Occupy: Customer Service, Department: Business, PMS Quater: Quarter 1, PMS Year: 2023) and the 'Objectives Details' table.

Key Performance Areas	Objectives	Key Performance Indicators	Metrics
Financial	Lower the operational cost.	A Minimum of 30%	<input type="text"/>
Process improvement	Design efficient work flow	Create high level flowchart	<input type="text"/>
Service Delivery	Fast track delivery of solutions	At least 3 weeks	<input type="text"/>
Quality Assurance	Make regression testing	Provide test reports	<input type="text"/>

Buttons: Cancel, Save Changes

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Designed & Coded by: @ Ramlochund Gilendrajeet

Figure 156:GUI Employee Add Metrics

### 9.11.7.3 GUI Employee View PMS Result

The screenshot shows the 'Employee Performance Management System' interface. On the left is a sidebar with a user profile picture, the text 'Employee Online', and a list of menu items: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main content area displays the 'Performance Management System -Van Persie Metrics' for Employee ID: EMP0002. It shows details like Name: Van Persie, Surname: Persie, Employment Type: Employee, Date Joined Company: 2016-10-03, Post Occupy: Customer Service, Department: Business, PMS Quater: Quarter 1, and PMS Year: 2023. Below this, it shows the 'EMPLOYEE PMS SCORE:' as 26.25 and the 'EMPLOYEE PMS RESULT:' as Exceeded. A section titled 'Objectives Details' lists KPIs across five areas: Financial, Process improvement, Service Delivery, and Quality Assurance. At the bottom, there is a 'Print' button.

Figure 157: GUI Employee View PMS Result

### 9.11.7.4 GUI Employee Print PMS Result

This screenshot shows the same system as Figure 157, but with a 'Print' dialog box overlaid. The dialog box has 'Adobe PDF' selected as the destination. It includes options for 'Pages' (All), 'Color mode' (Color), 'Scale' (Fit to page width), 'Pages per sheet' (1), and 'Margins' (Default). At the bottom right of the dialog is a 'Print' button.

Figure 158: GUI Employee Print PMS Result

### 9.11.8 Wireframe Employee E-Payslip

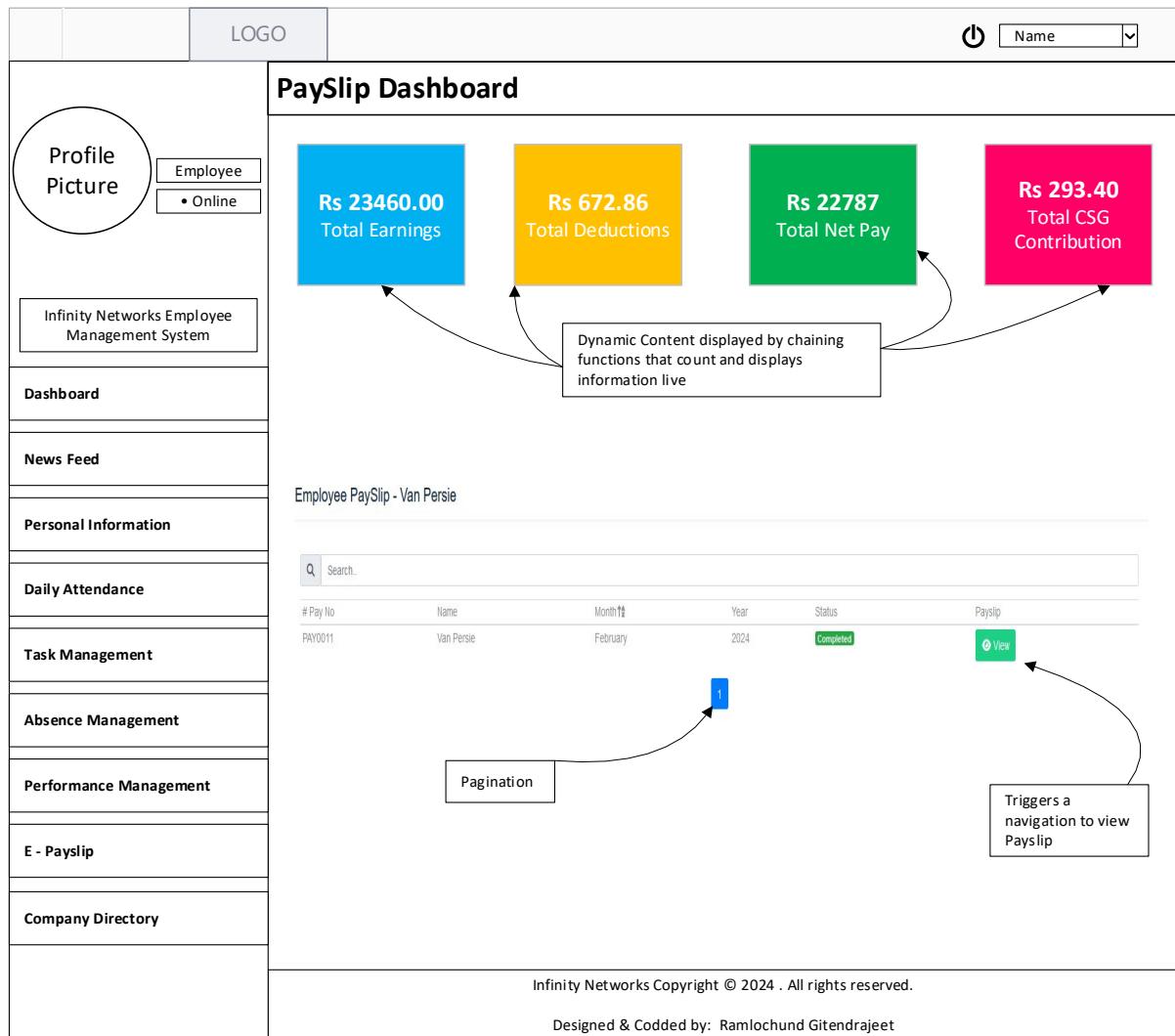


Figure 159: Wireframe Employee E-Payslip

### 9.11.8.1 GUI Employee E-Payslip

The screenshot shows the 'PaySlip Dashboard' for an employee named 'Van Persie'. The dashboard features four summary cards:

- Total Earnings:** Rs 23460.00
- Total Deductions:** Rs 672.86
- Total Net Pay:** Rs 22787
- Total CSG Contribution:** Rs 293.40

Below the dashboard, the 'Employee PaySlip - Van Persie' section displays a table with one row of data:

# Pay No	Name	Month	Year	Status	Payslip
PAY0011	Van Persie	February	2024	Completed	<a href="#">View</a>

At the bottom of the page, there is a footer with copyright information and developer credits.

Figure 160: GUI Employee E-Payslip

### 9.11.8.2 GUI Employee View Payslip

The screenshot shows the 'INFINITY NETWORKS PAY SLIP' for Employee ID: EMP0002. The slip includes the following details:

Employee ID : EMP0002	Name : Van
Surname : Persie	Employment Type : Employee
Department : Business Unit	Post Occupy : Customer Service
Month : February	Year : 2024

Below this, a table shows the breakdown of earnings and deductions:

Earnings	Amount(Rs)	Deductions	Amount(Rs)
Basic Salary	19560.00	Medical Contribution	195.60
Overtime	1500.00	CSG Contribution	293.40
Bus Fare	2400	NSF Contribution	183.86

At the bottom, there is a 'Print Payslip' button and a footer with copyright information and developer credits.

Figure 161: GUI Employee View Payslip

### 9.11.9 Wireframe Company Directory

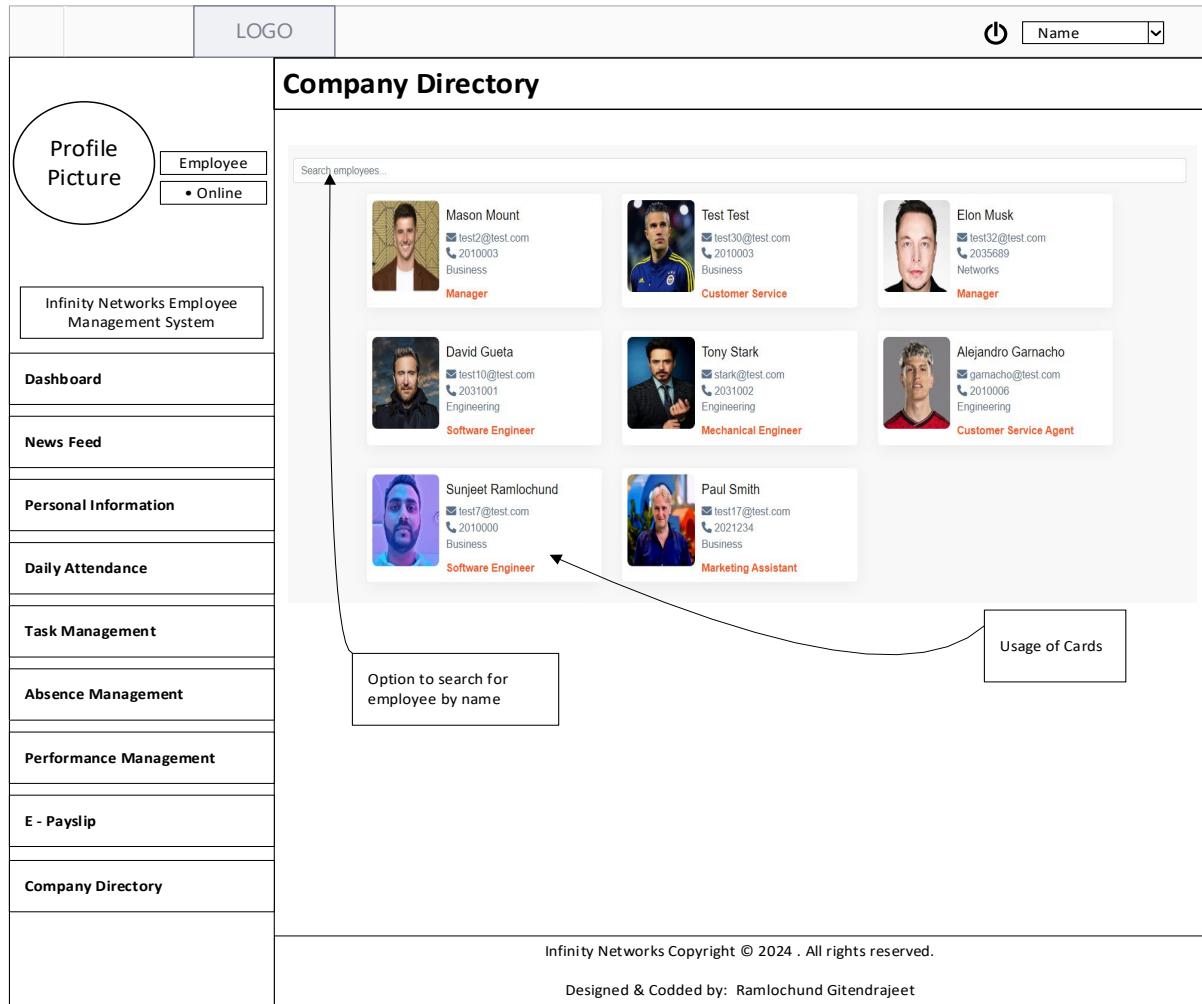


Figure 162: Wireframe Company Directory

#### 9.11.9.1 GUI Company Directory

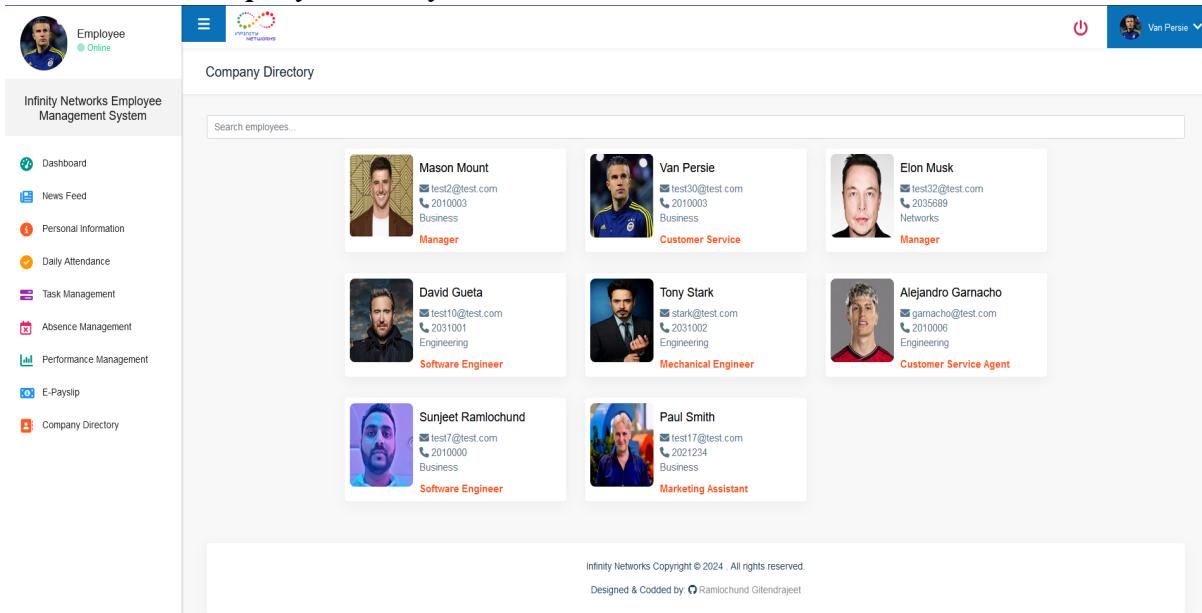


Figure 163: GUI Company Directory

## 9.12 WIREFRAME: THE MOBILE APP

Infinity Networks Mobile Solutions is a dynamic and user-friendly mobile application designed to enhance everyday tasks and operations. This app provides a comprehensive platform for managing user details, leaves, and a directory of employees. It seamlessly integrates Firebase Authentication and Firestore, ensuring secure data storage and easy access.

The app's user-centric approach emphasizes efficient user registration and data entry, simplifying the process for both administrators and employees. The app has been built on a fully cloud deployment, though the use of self-created API's, Firestore, firebase and firebase storage.

The app comprises of 2 different solutions, one for employees and one for administrator, administrator has the admin access to create user and a one-click, it can create all the data entry for a user in a real time live system. On the other app , employees can view their leaves balances , view internal live newsfeed of company, view company directory and employees can updates their details through the app itself.

### 9.12.1 The Administrator App

The administrator app gives the admin the ability to create users onto the system using the firebase userUID through the app.

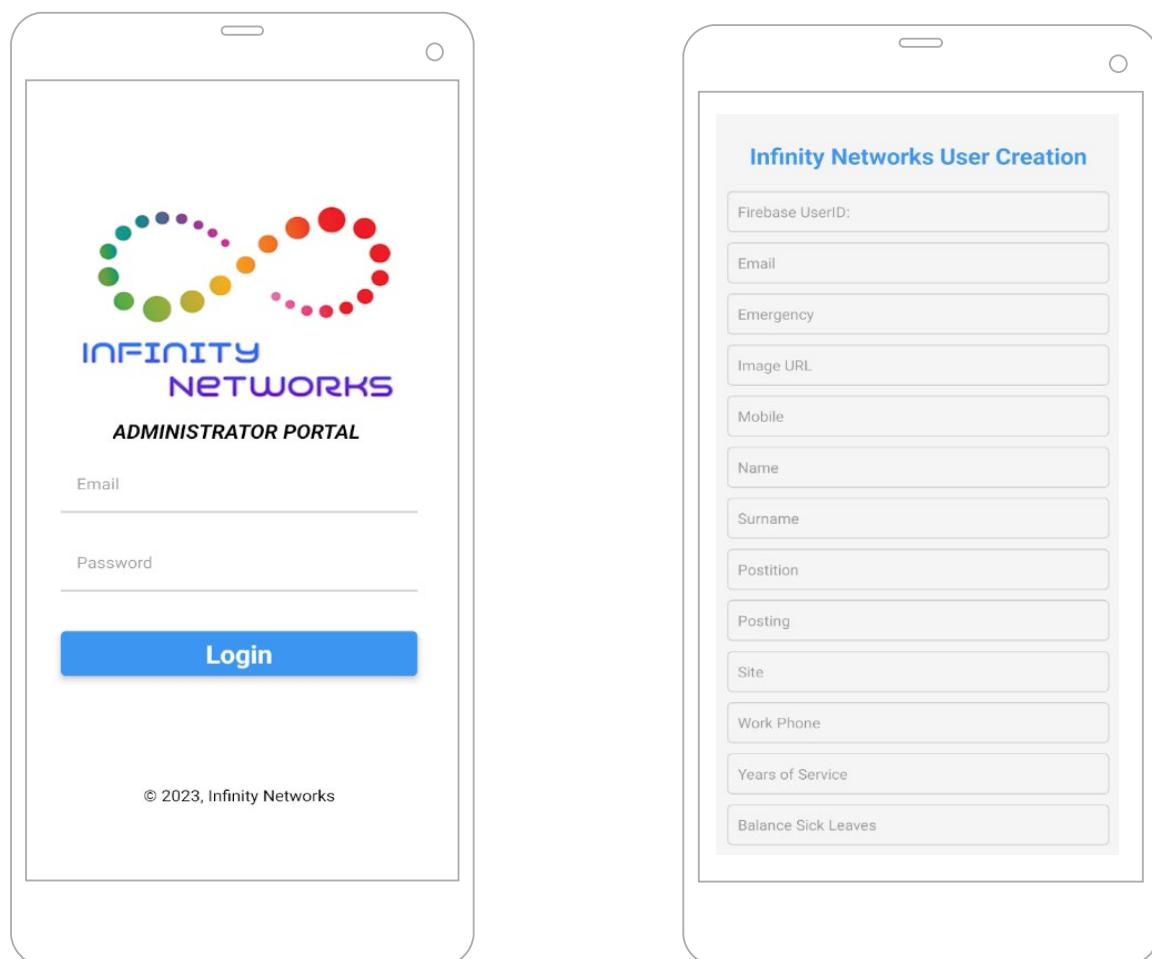


Figure 164 Wireframe: The Administrator Mobile App

Upon successful login the app does popup and alert to notify user access if unauthorized, require immediately to log out. Upon click OK, it proceeds to the User Creation page.

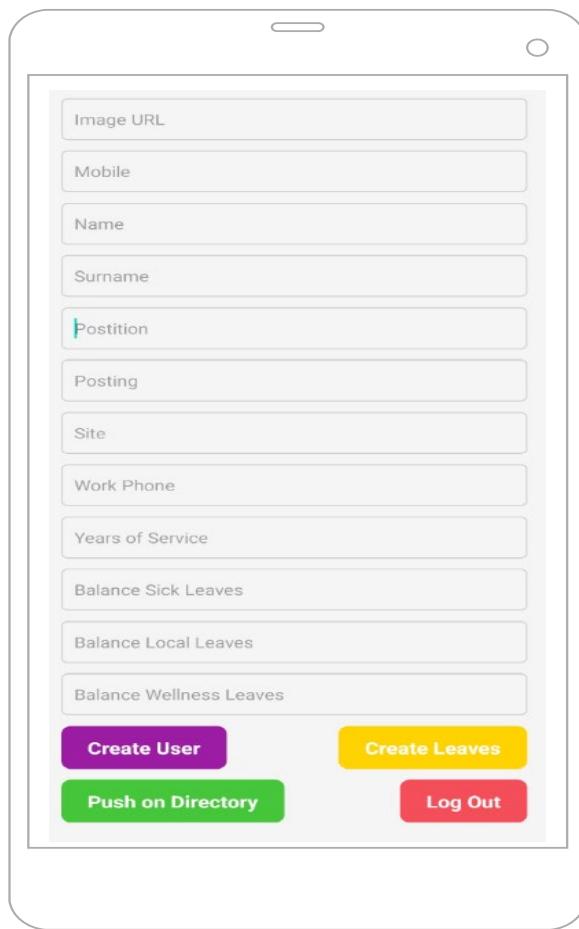


Figure 165 Wireframe: Administrator Mobile App Part 2

Upon admin press the

1. **[Create User]** → the app triggers a function to create the user onto cloud Firestore user-details collection using the userID from firebase authentication.
2. **[Create Leaves]** → the app triggers a function to create the user leaves onto cloud Firestore leaves collection using the userID from firebase authentication.
3. **[Push on Directory]** → the app triggers a function to create the user onto the directory cloud Firestore directory collection using the userID from firebase authentication.
4. **[Log Out]** → the app triggers the logout function to immediately log out the user.

### 9.12.1.1 GUI Administrator Mobile App

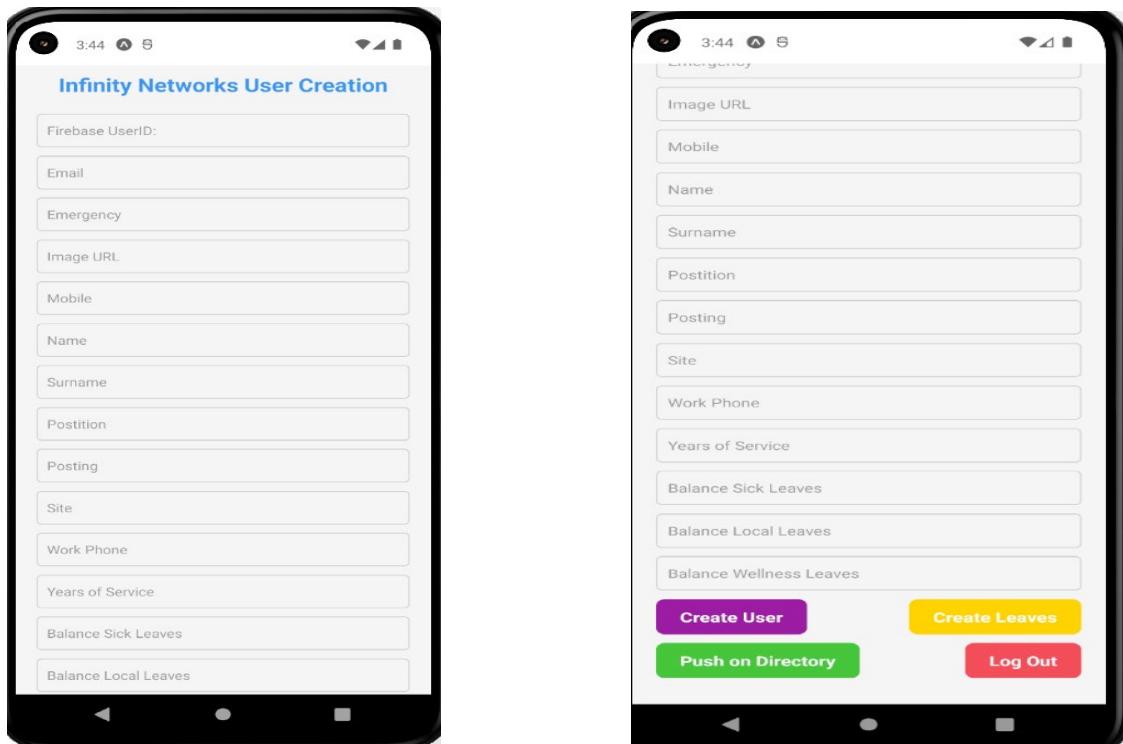
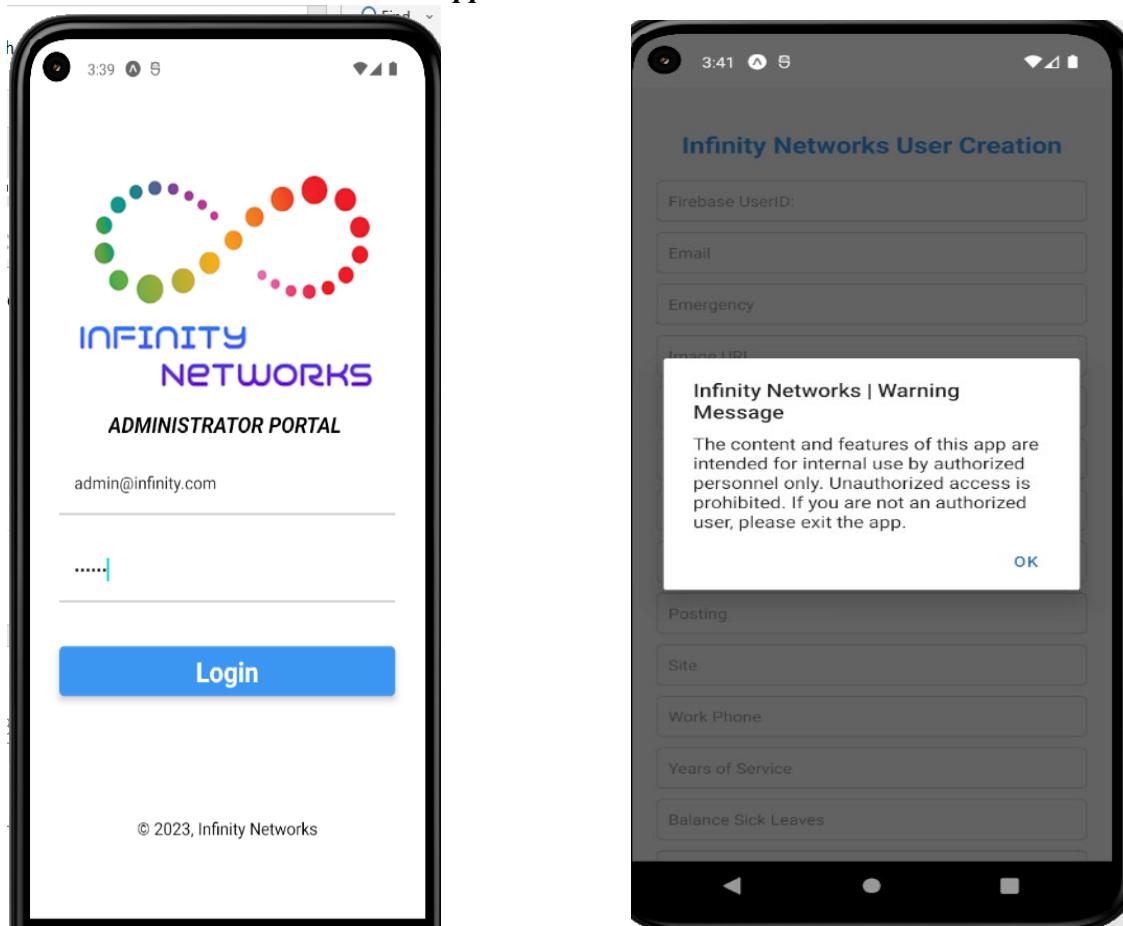


Figure 166 GUI: Administrator Mobile App

### 9.12.2 The Employee App

The employee app give access to the multiple functionalities of the app but, the employee cannot enrol himself or herself onto the app, only the administrator of Infinity Networks has the right to create, update or revoke users from the system.

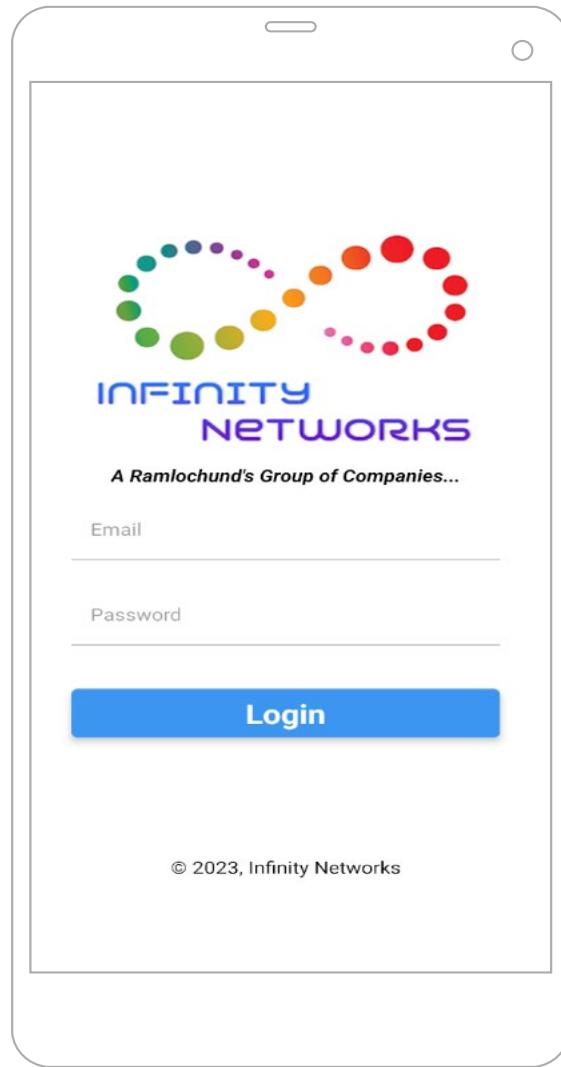


Figure 167 Wireframe: Employee Mobile App

The activity sequence as follows:

Employee interaction with login screen:

- Employee → Input wrong Credentials → app display error message and specify the error
- Employee → Does not input credentials and press login → app display error
- Employee → Input correct credential → app logs in and display a warning to aware about unauthorized access and then displays the home screen.

### 9.12.2.1 GUI Employee Mobile App Login Screen and Home Screen

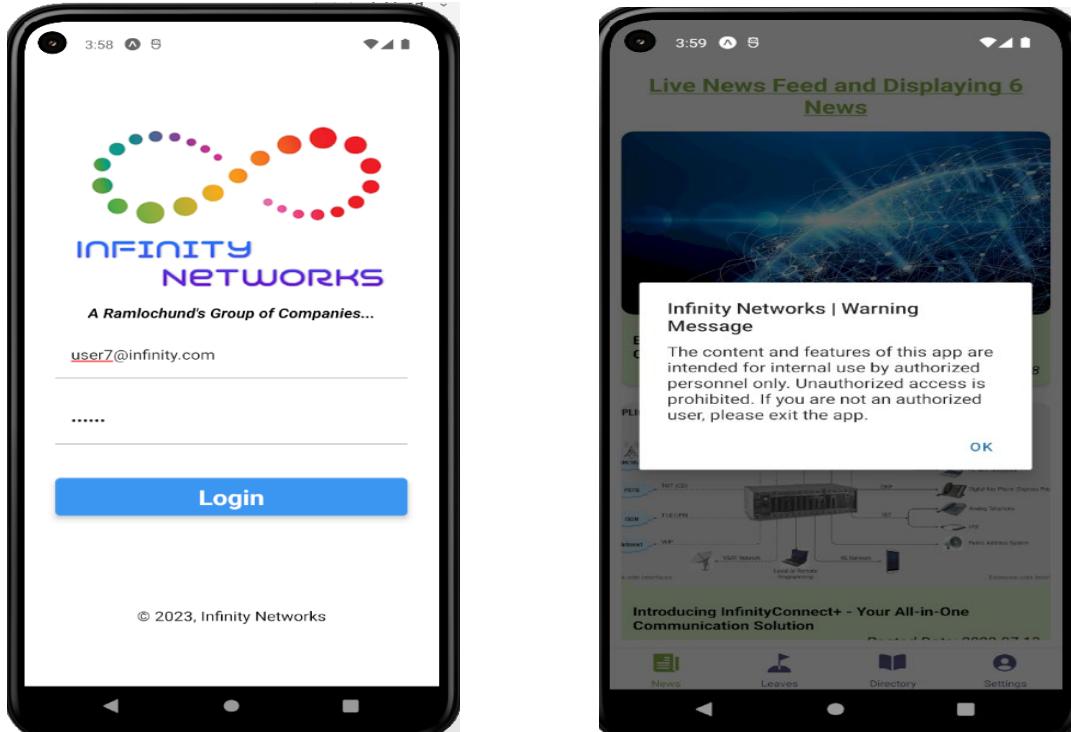


Figure 168: GUI: Login and Home Screen

### 9.12.3 Wireframe News Feed and View News Feed

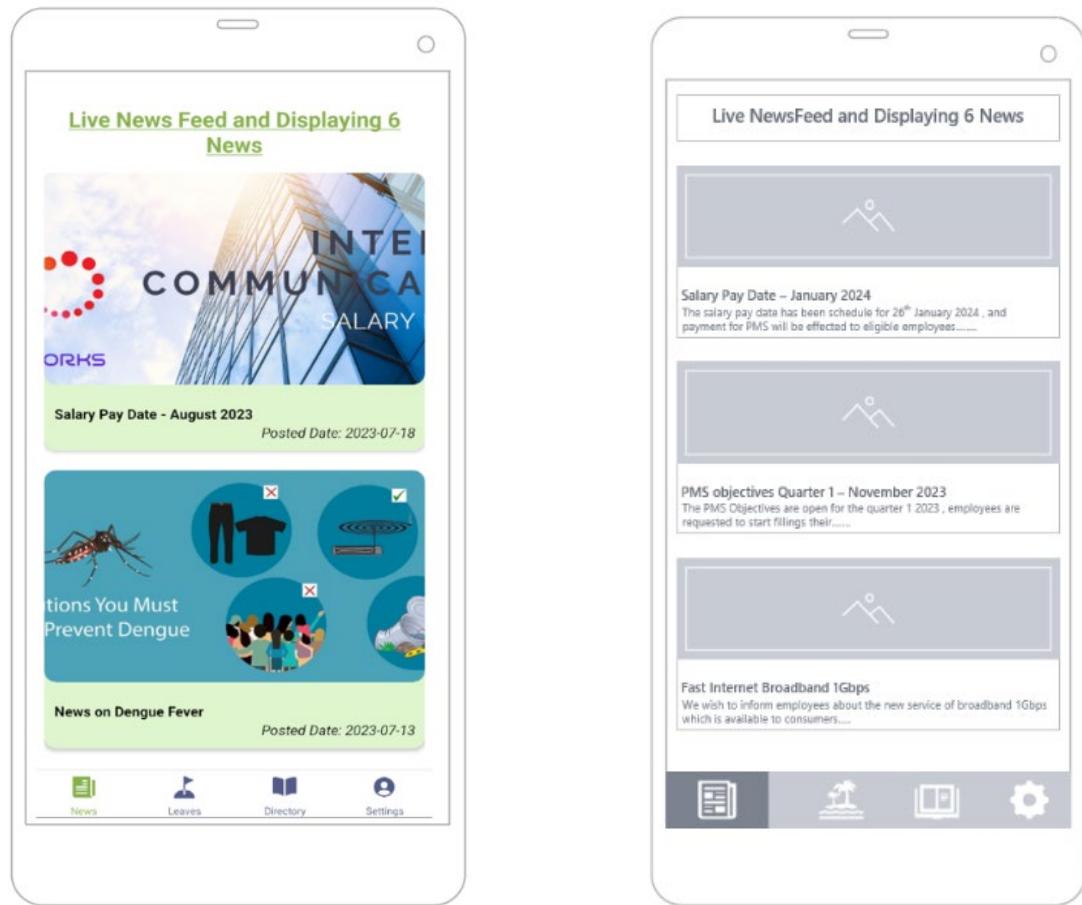


Figure 169 Wireframe: NewsFeed and View News

### 9.12.3.1 The Home Screen in Details



### 9.12.3.2 GUI News Feed and View News Feed

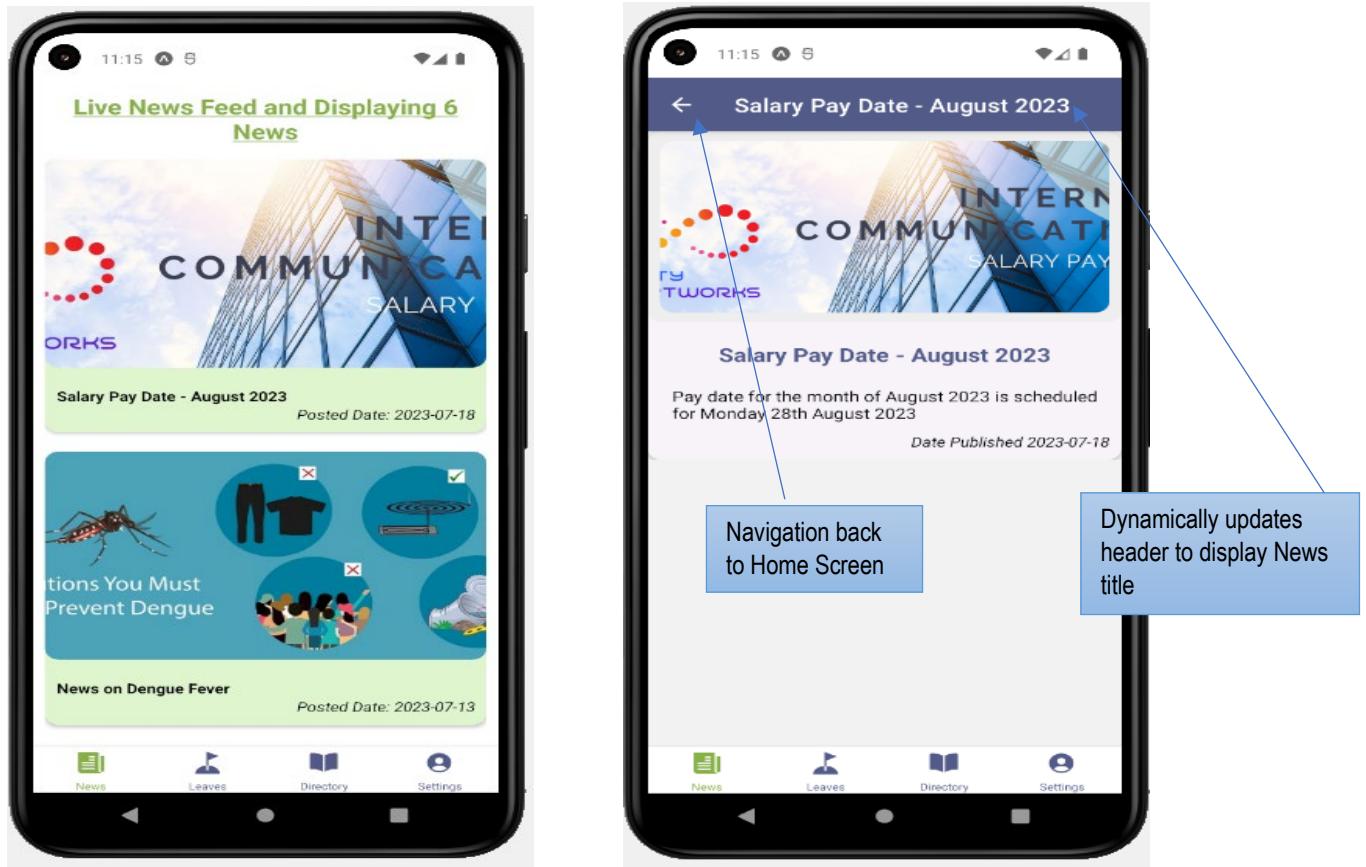


Figure 170 GUI: News Feed and View News

### 9.12.4 Wireframe and GUI Leaves

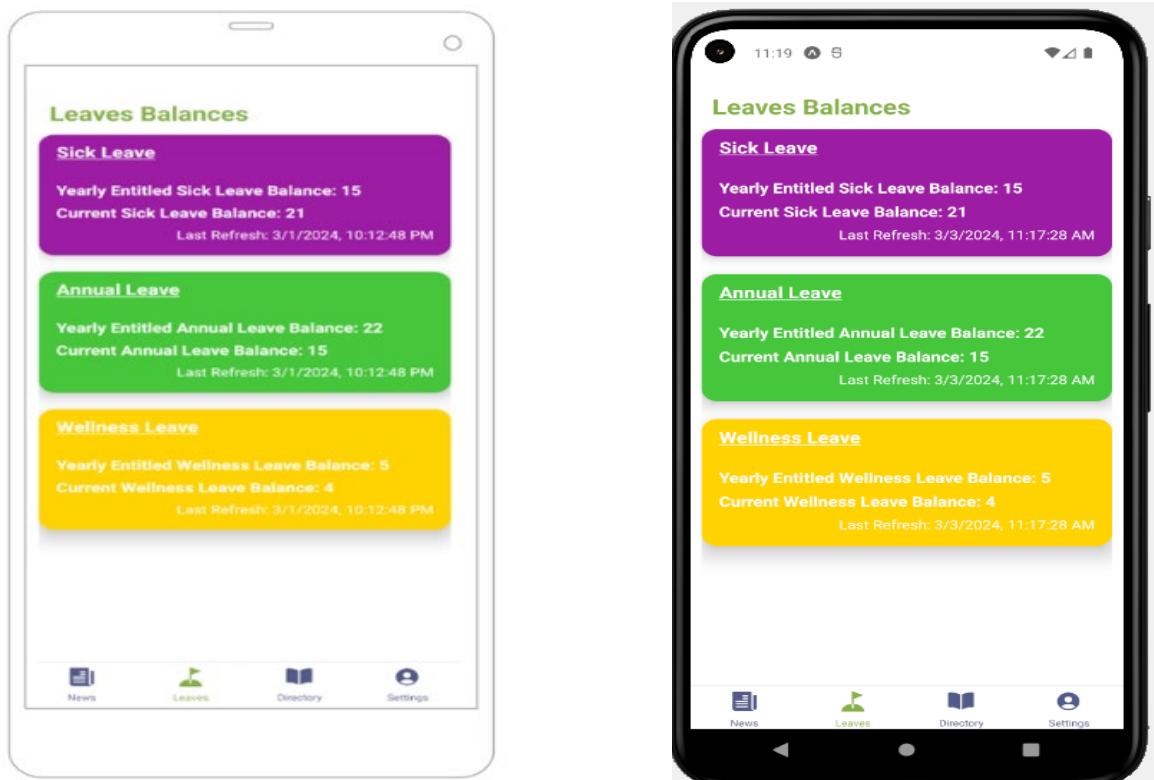


Figure 171 Wireframe and GUI Employee Leaves

### 9.12.5 Wireframe and GUI Directory

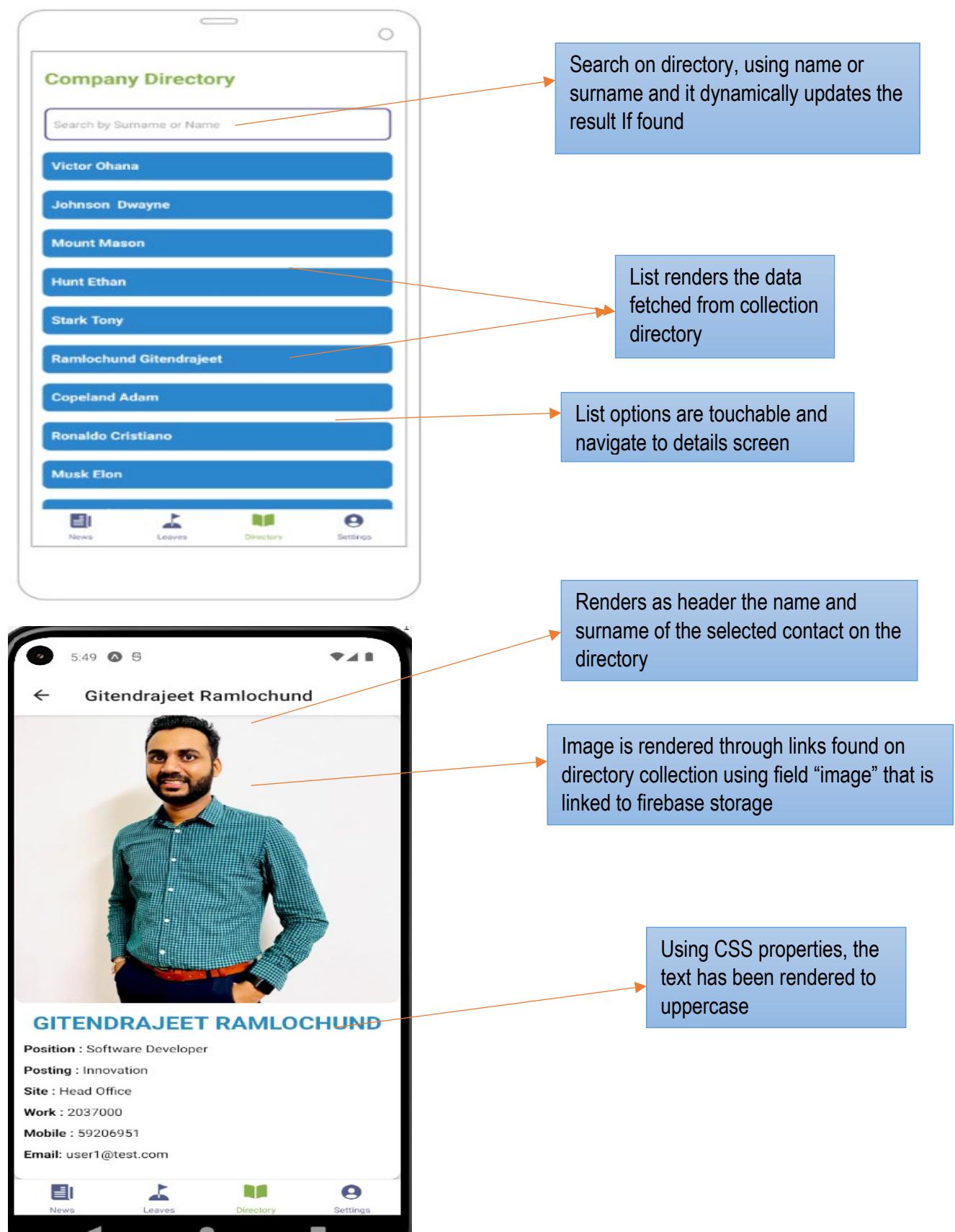


Figure 172 Wireframe and GUI Company Directory

### 9.12.6 Wireframe and GUI Employee Profile and Settings

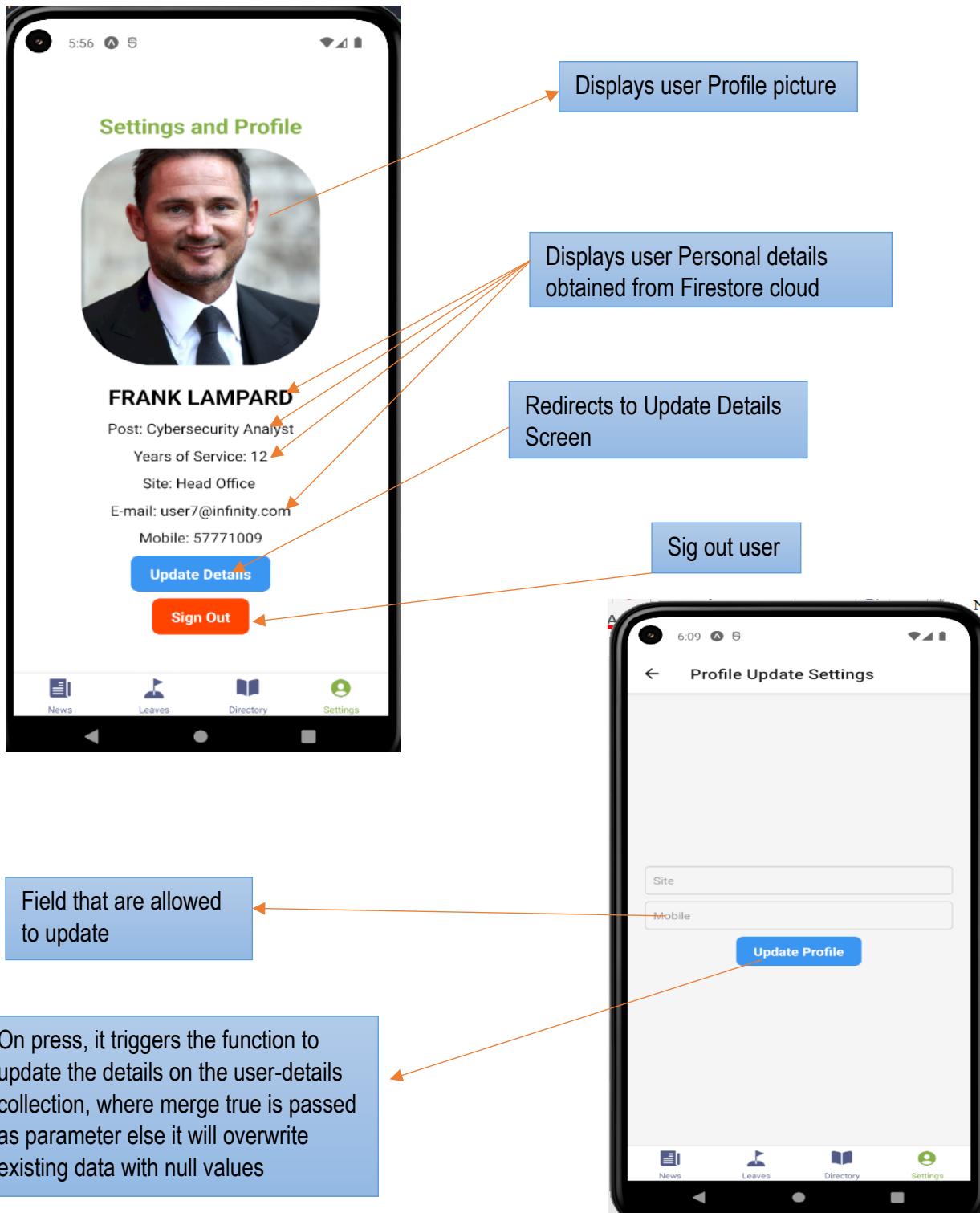
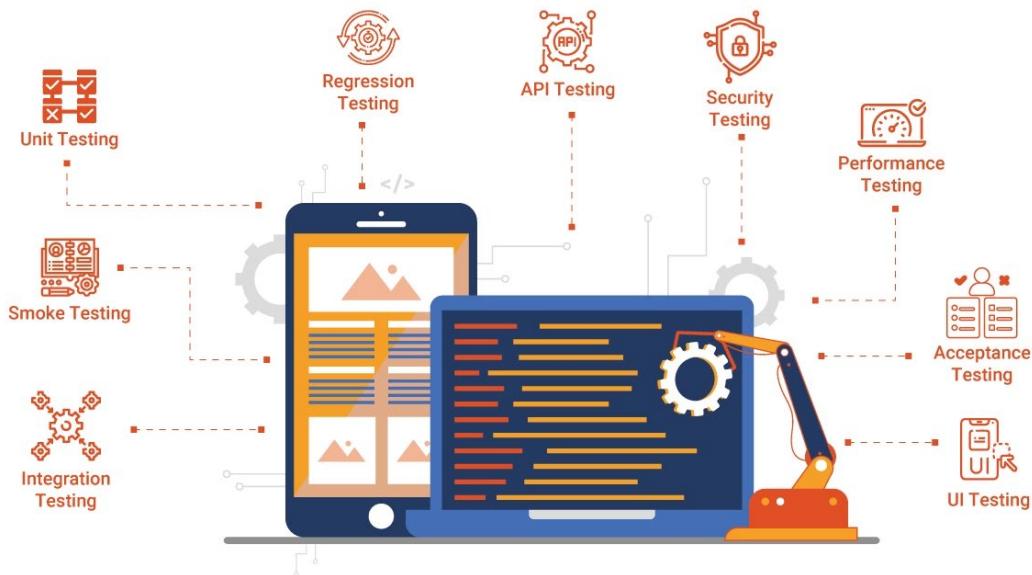


Figure 173 Wireframe and GUI Employee Profile and Settings



# TESTING AND IMPLEMENTATION



INFINITY  
NETWORKS

## 9.13 TESTING AND IMPLEMENTATION

This procedure serves as the logical culmination of the evaluation, decision-making, visioning, and planning phases of the Infinity Networks Online Employee Management System. It ensures that specifications are not only feasible but also implemented in practice and adhered to in the actual system implementations. By undergoing this comprehensive assessment, the system can verify its viability, functionality, and alignment with organizational goals, thereby laying the groundwork for successful deployment and utilization.

## 9.14 CODING STANDARDS, GUIDELINES AND DEVELOPMENT TOOLS

### 9.14.1 Back End PHP Version

PHP version 7.4.30 has been utilized for the development of OEMS (Online Employee Management System). This version of PHP provides various enhancements and features to facilitate efficient and secure web application development.

### 9.14.2 Browser Software

Firefox Developer Edition version 123.0b9 (64-bit), a freely available browser software, has been employed for development purposes. This edition offers various developer-friendly features and tools to aid in the creation and testing of web applications.

### 9.14.3 Front End Presentation layer

The Pluto Bootstrap 4 template, developed by *ThemeWagon*, has been customized through forking from its GitHub repository. Significant modifications have been made, particularly in the navigation structure and container usage to enhance the presentation of data. Additionally, extensive code clean-ups have been conducted to eliminate unused dependencies, thereby optimizing software runtime performance.

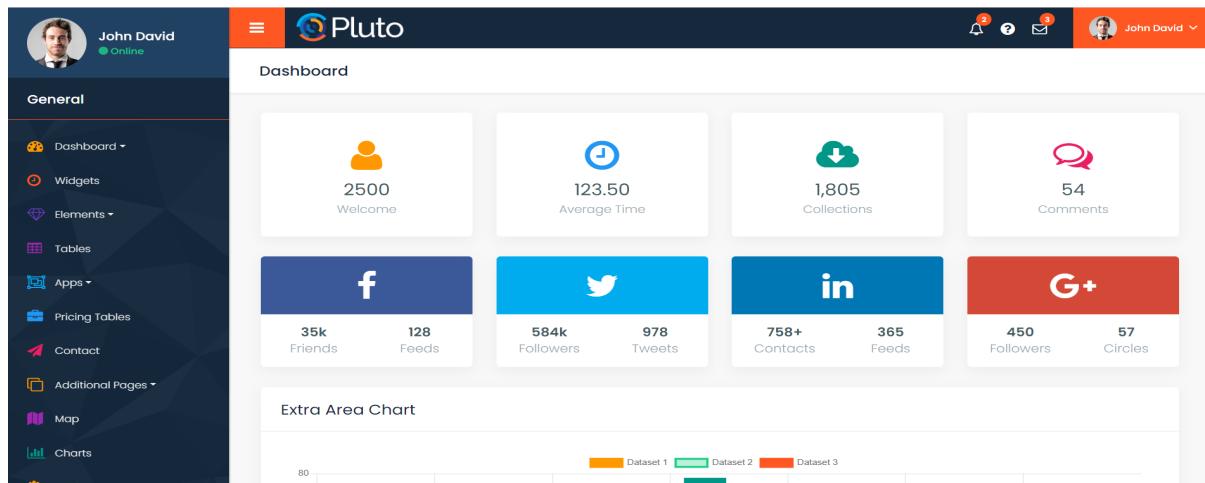


Figure 174: Pluto Theme from GitHub

*“Pluto is a Free Html Bootstrap Admin Template. This free admin template is well suited for web applications, business website and all that online project that needs admin dashboard. This Html admin website template save your time and money by completing all the task without any complications.”*

**License:** Creative Commons 3.0 – Free to use for personal and commercial use

After undergoing significant modifications, the Pluto Template has been refined to improve the navigation structure and container usage, resulting in enhanced data presentation. Extensive code clean-ups have also been implemented to remove unused dependencies, leading to optimized software runtime performance.

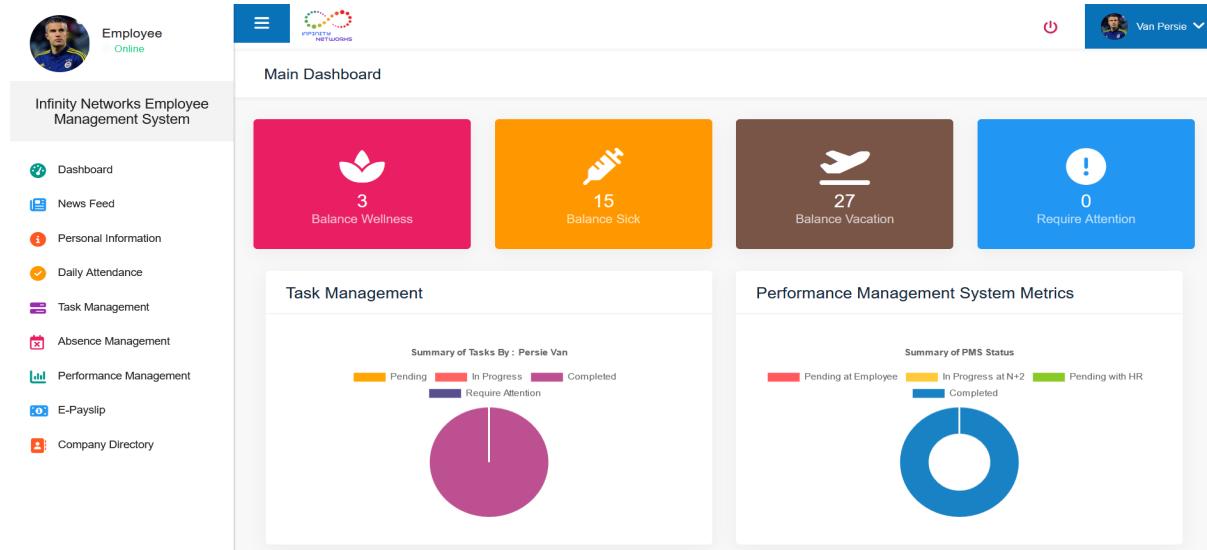


Figure 175:Pluto Template after clean-up and adding personal touch

These adaptations ensure a more tailored and efficient user experience within the Infinity Networks Online Employee Management System.

#### 9.14.4 Apache Server for hosting services

XAMPP version 3.2.4, a freely available Apache distribution, has been utilized for the Infinity Networks Online Employee Management System. This version includes MariaDB, PHP, and Perl, offering a convenient and straightforward installation process.

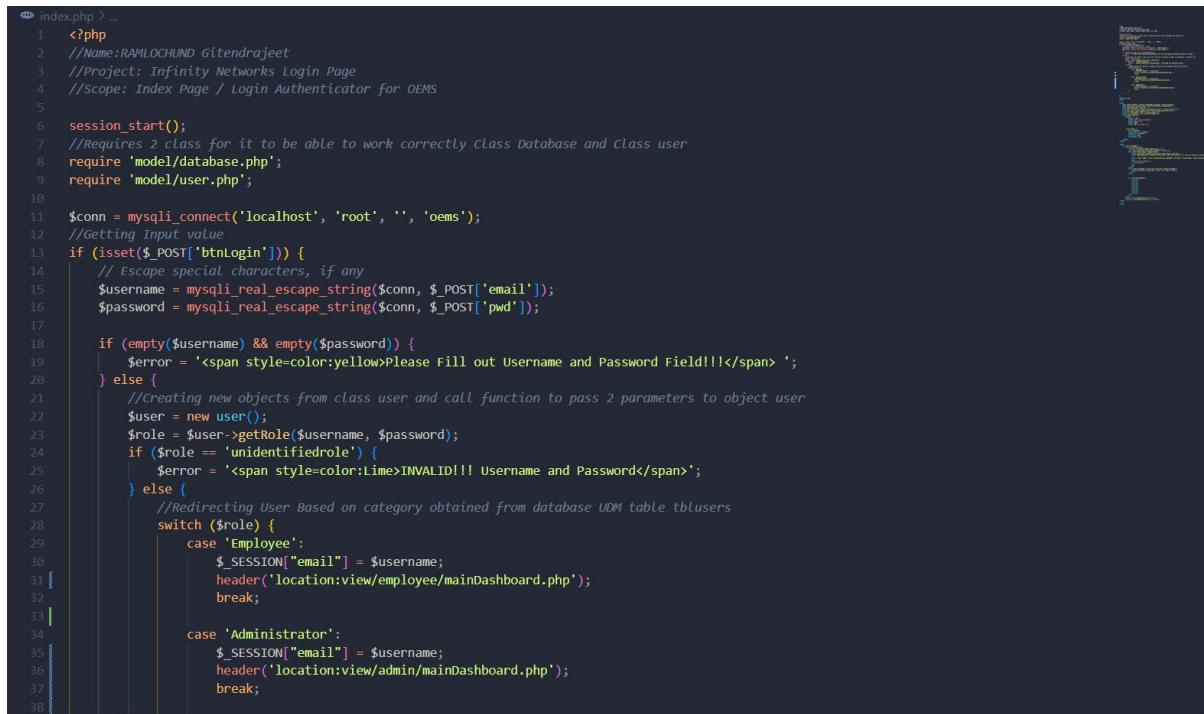
#### 9.14.5 Coding Software

Visual Studio Code Version 1.86.2 has been employed for coding both the front end and back end of the Online Employee Management System (OEMS). This versatile and widely used code editor offers a range of features and extensions that enhance productivity and facilitate smooth development workflows.

#### 9.14.6 Line breaks, Spaces, and Indentation

In accordance with the guidelines for line breaks, spaces, and indentation:

- Indentation is achieved using two spaces, avoiding tab characters.
- A space is left after commas in argument lists.
- Function names are not separated by spaces.
- Parentheses are wrapped around content as appropriate.



```

index.php > ...
1  <?php
2  //Name:RAMLOCHUND Gitendrajeet
3  //Project: Infinity Networks Login Page
4  //scope: Index Page / Login Authenticator for OEMS
5
6  session_start();
7  //Requires 2 class for it to be able to work correctly class Database and class user
8  require 'model/database.php';
9  require 'model/user.php';
10
11 $conn = mysqli_connect('localhost', 'root', '', 'oems');
12 //Getting Input value
13 if (isset($_POST['btnLogin'])) {
14     // Escape special characters, if any
15     $username = mysqli_real_escape_string($conn, $_POST['email']);
16     $password = mysqli_real_escape_string($conn, $_POST['pwd']);
17
18     if (empty($username) && empty($password)) {
19         $error = '<span style="color:yellow>Please Fill out Username and Password Field!!!</span> ';
20     } else {
21         //Creating new objects from class user and call function to pass 2 parameters to object user
22         $user = new user();
23         $role = $user->getRole($username, $password);
24         if ($role == 'unidentifiedrole') {
25             $error = '<span style="color:lime>INVALID!!! Username and Password</span>';
26         } else {
27             //Redirecting User Based on category obtained from database UDM table tblusers
28             switch ($role) {
29                 case 'Employee':
30                     $_SESSION["email"] = $username;
31                     header("location:view/employee/mainDashboard.php");
32                     break;
33
34                 case 'Administrator':
35                     $_SESSION["email"] = $username;
36                     header("location:view/admin/mainDashboard.php");
37                     break;
38             }
39         }
40     }
41 }
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```

### 9.14.8 Code Tags in PHP

Always use <?php?> to delimit PHP code, rather than the <? ?> shorthand. This is the most portable technique to include PHP code on many operating systems and installations, and it is necessary for PEAR compliance.

```
<br>
| | |   <?php if(isset($error)) {echo $error;}?>
<br>
```

Figure 178: PHP Code Tags

### 9.14.9 Brief Methods of Functions

Methods should be concise and focused, with a maximum length of a single page of code. This practice helps maintain readability and manageability of the codebase.

```
// Function to Change Password
public function changePassword($user_id, $password)
{
    $database = new DBHandler();

    // Prepared statement
    $database->query('UPDATE tbl_user SET password = :password WHERE user_id = :user_id');

    // Bind parameters
    $database->bind(':user_id', $user_id);
    $database->bind(':password', $password);

    // Execute prepared statement
    $database->execute();
}
```

Figure 179: Short Method in PHP

```
controller > employee > changePassword.php > ...
1  <?php
2  require('../model/user.php');
3  session_start();
4  $database = new DBHandler();

5
6  if (isset($_POST["btnSubmit"])) {
7      $user_id = $_POST['user_id'];
8      $password = $_POST['password'];
9
10
11     $user = new user();
12     $user->changePassword($user_id, $password);
13     $_SESSION['changePass'] = true;
14 }
15 header('location:../../view/employee/myinformation.php');
16 |
```

Figure 180: Calling Method in PHP

#### 9.14.10 Case Sensitivity and Capitalization

- Variables and functions: Use lowercase with underscores.
- Classes: Name classes using UpperCamelCase.
- Methods and properties: Name using lowerCamelCase.

```
//Function to update UAC in Database
public function updateUAC($user_id, $isActive)
{
    $database = new DBHandler();
    //prepared statement
    $database->query('UPDATE tbl_user SET isActive=:isActive WHERE user_id=:user_id');

    //call bind method in database class
    $database->bind(':user_id', $user_id);
    $database->bind(':isActive', $isActive);
    //execute prepared statement
    $database->execute();
}
```

Figure 181: Case Sensitivity and Capitalization

### 9.15 IMPLEMENTATION OF SEVERAL COMPONENTS

The components listed below contain a variety of strategies that have all been very helpful to me in completing successful projects.

#### 1. Object Oriented Analysis and Design

- **Responsive Web Design:** Ensured the user interface of OEMS is responsive, providing optimal viewing experience across different devices such as mobile phones, tablets, and desktops.
- **Flat Style Quality Design:** Implemented a modern and visually appealing flat design for the user interface elements of OEMS.
- **Mobility Interface:** Developed a user-friendly interface that allows easy navigation and interaction with OEMS on mobile devices.

#### 2. Project Management System

- **Methodology Used:** Employed a structured project management methodology such as Agile to plan, execute, and monitor the development process of OEMS.
- **Cost Estimation:** Utilized a top-down approach to estimate the cost of developing OEMS, considering factors such as development resources, technology, and project scope.

#### 3. Advanced Database Techniques

- **Data Management:** Implemented functionalities to create, modify, and read data related to users, pms, leaves, and tasks in the database.
- **Querying Database:** Utilized SQL statements to query data from the database efficiently and accurately.

#### 4. Web Development

- **Appropriate Technology:** Choosed appropriate web development technologies and techniques such as HTML, CSS, JavaScript, and PHP to build OEMS.

#### 5. Graphics and Multimedia

- **Color Scheme:** Used a proper color scheme that enhances the visual appeal and usability of OEMS.
- **Optimized Graphics:** Optimized graphics and multimedia elements for web viewing to ensure fast loading times and smooth user experience.
- **Image Format:** Used PNG, Jpeg format for graphics and images, and optimize their size to reduce loading times.

#### 6. Software Quality Assurance

- **Software Testing:** Prioritized software testing throughout the development lifecycle of OEMS, ensuring high quality, reliability, and functionality of the system. Utilize techniques such as unit testing, integration testing, and user acceptance testing to validate the system's performance and usability.

### 9.16 CRITICAL CODES SEGMENTS

Combining tables using advanced database techniques has always been a challenging endeavour, especially within PHP environments lacking an Integrated Development Environment (IDE). Testing and ensuring the desired outcome become imperative under such circumstances.

Figure 170 represents a segment of a function responsible for retrieving all employees from the user table while excluding users with the Administrator role, illustrating the complexity involved in utilizing advanced database functionalities within PHP-based systems

```
// Get All Details from Employee Table
public function getAllEmployees($database)
{
    $database->query('SELECT *
    FROM tbl_employee e
    LEFT JOIN tbl_user u ON u.user_id = e.user_id
    WHERE u.role != "Administrator"');

    // Execute the query
    $row = $database->resultset();
    return $row;
}
```

Figure 182:Joining Tables in SQL

## **9.17 CHALLENGES ENCOUNTERED AND ITS RESOLUTIONS**

**Difficulty 1:** To Start, I had some difficulty selecting a suitable programming language either web or mobile.

**Resolution 1:** Initially, I embarked on the project using React Native programming, drawing from my prior experience with Infinity Networks Mobile Solutions. However, after several discussions with my project supervisor and showcasing the progress made, it became evident that the mobile solution might not fully accommodate all the desired features and would require significant time to design logics and information flows. Therefore, based on suggestions from my supervisor, I made the decision to transition to PHP for a web programming solution.

**Difficulty 2:** Another hurdle was the lack of encouragement and assistance throughout the project. With multiple demanding modules to handle during the semester, finding enough time for this project became a struggle. This lack of support made it tougher to manage time effectively and stay motivated.

**Resolution 2:** To address this issue, I sought support from my peers and instructors whenever possible. Additionally, I prioritized tasks and managed my time efficiently to ensure progress on the project despite other academic commitments. Additionally, setting clear goals and staying organized helped me stay focused and motivated throughout the development process.

## **9.18 TEST PLAN AND TESTS**

Software testing is the process of running a program or application to identify any potential issues or bugs. It involves validating and confirming that the software, application, or finished product functions as expected.

- Satisfies the technological and business requirements that influenced its conception and development.
- can be used with the identical characteristic
- Functions as intended

### 9.18.1 Test Plan

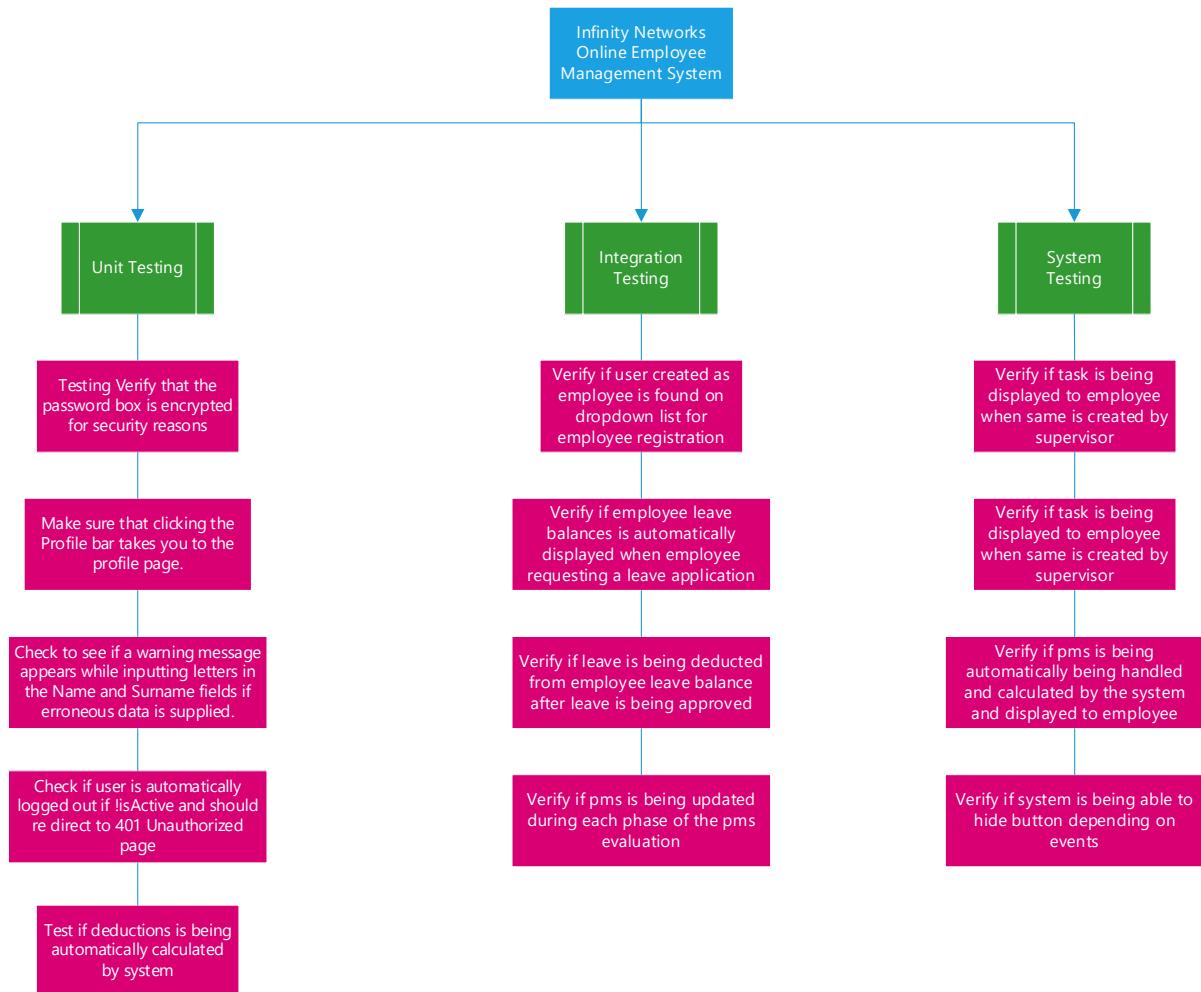


Figure 183: The Test Plan

### 9.18.2 Unit Testing

The White Box Testing approach is employed. A software testing technique known as "white box testing" involves the tester being aware of the internal organization, layout, and functionality of the product under test.

#### 9.18.2.1 When does it take place?

Prior to integration testing, unit testing is the first stage of software testing.

#### 9.18.2.2 Who will carry it out?

It will be carried out by the HR Administrator of Infinity Networks Employee Management System. Independent software testers might also carry it out in unusual circumstances.

**TEST 1: Verify that the password box is encrypted for security reasons.****How to replicate:**

- Enter the system by entering the URL
- Fill in Details and Enter password

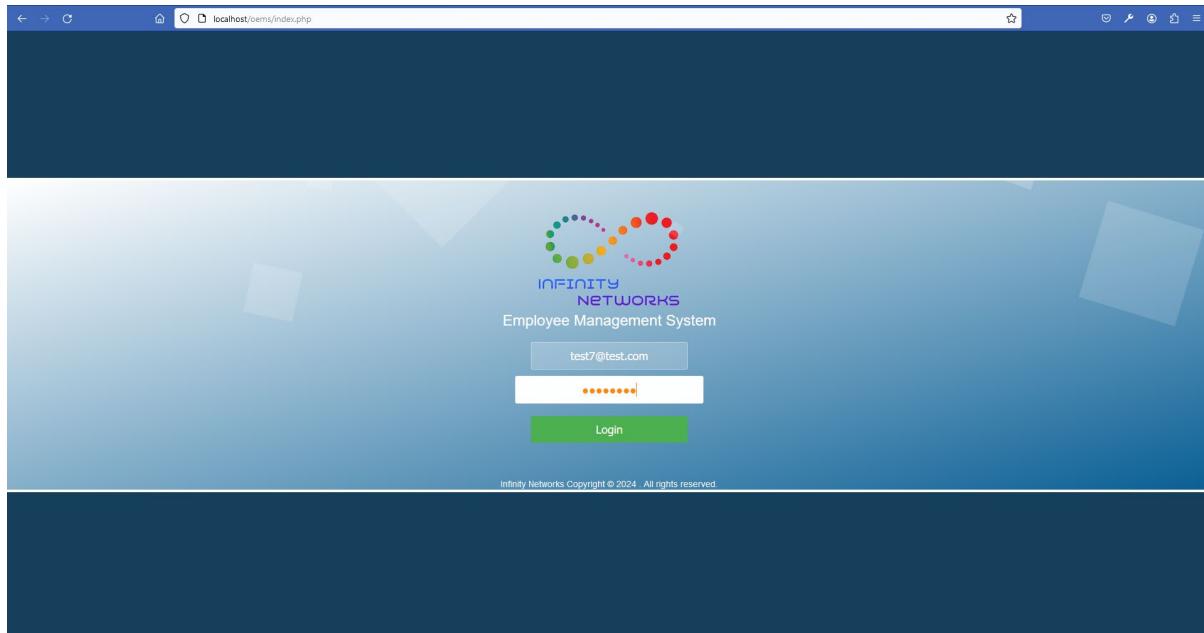


Figure 184 Unit Testing: Test Plan 1

**Expected Outcome:** Password should be encrypted and above Figure 172 is the evidence.

**TEST 2: Make sure that clicking the Profile bar takes you to the profile page.****How to replicate:**

- Login on System
- Click on the top right a dropdown list will show up, click it will redirect to the user profile.

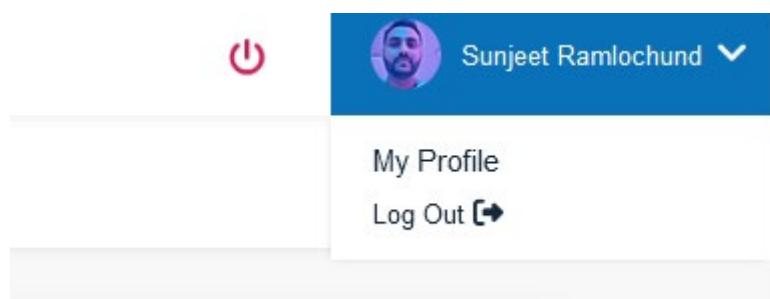


Figure 185 My Profile

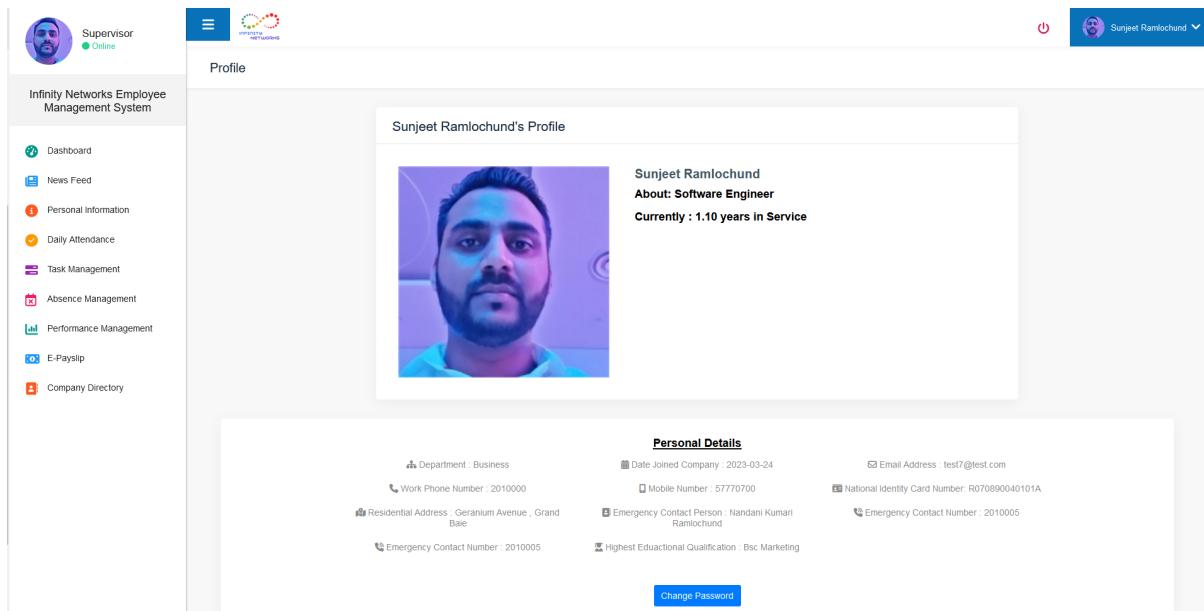


Figure 186 Unit Testing: Test Plan 2 Employee Profile

**Expected Outcome:** Redirects to Employee Profile and above Figure 174 is the evidence.

**TEST 3: Check to see if a warning message appears while inputting letters in the Name and Surname fields if erroneous data is supplied.**

#### How to replicate:

- Click on Create User on User Management Page
- Fill in Details and Enter numbers in Name or Surname fields
- Submit Form
- Error will be displayed

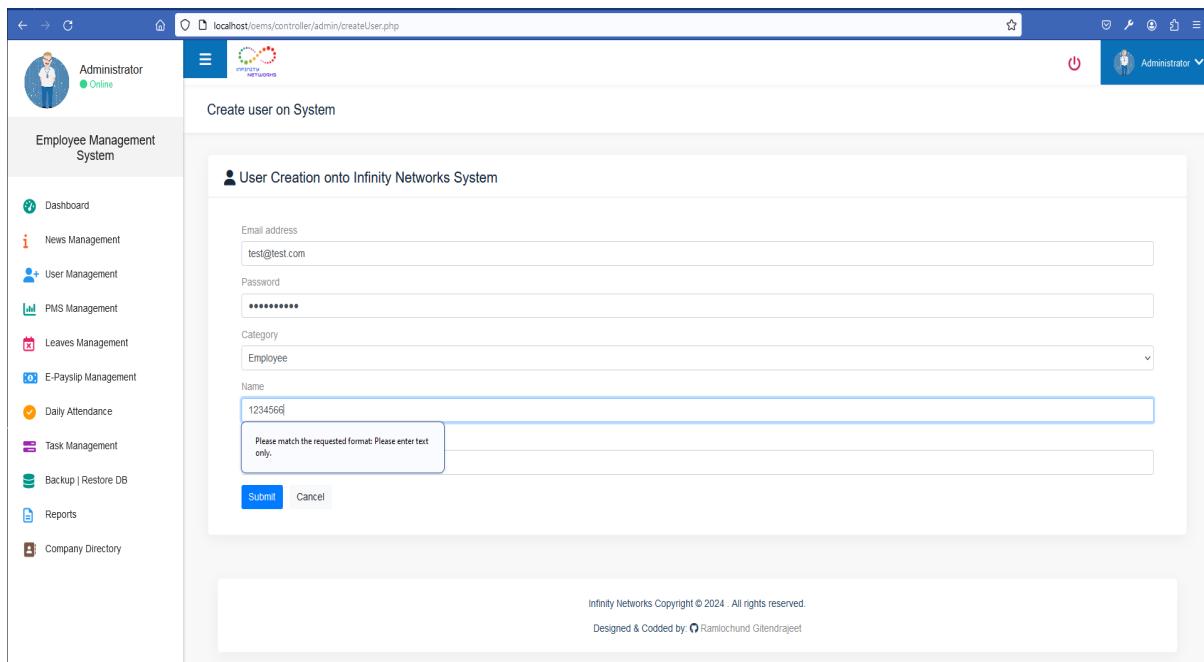


Figure 187 Unit Testing: Validation of Data

**Expected Outcome:** Error Message is displayed and Evidence Figure 175 demonstrate same.

**TEST 4: Check if user is automatically logged out if !isActive and should re direct to 401 Unauthorized page**

**How to replicate:**

- Click on User Management Page
- User being used for the test: **test17@test.com**
- Click → Modify UAC → Set Revoke User Access → Select Yes → Save Changes
- System will display a message, User Access Control Updated successfully!
- Now log onto system → will disable access in real time after revoke success.

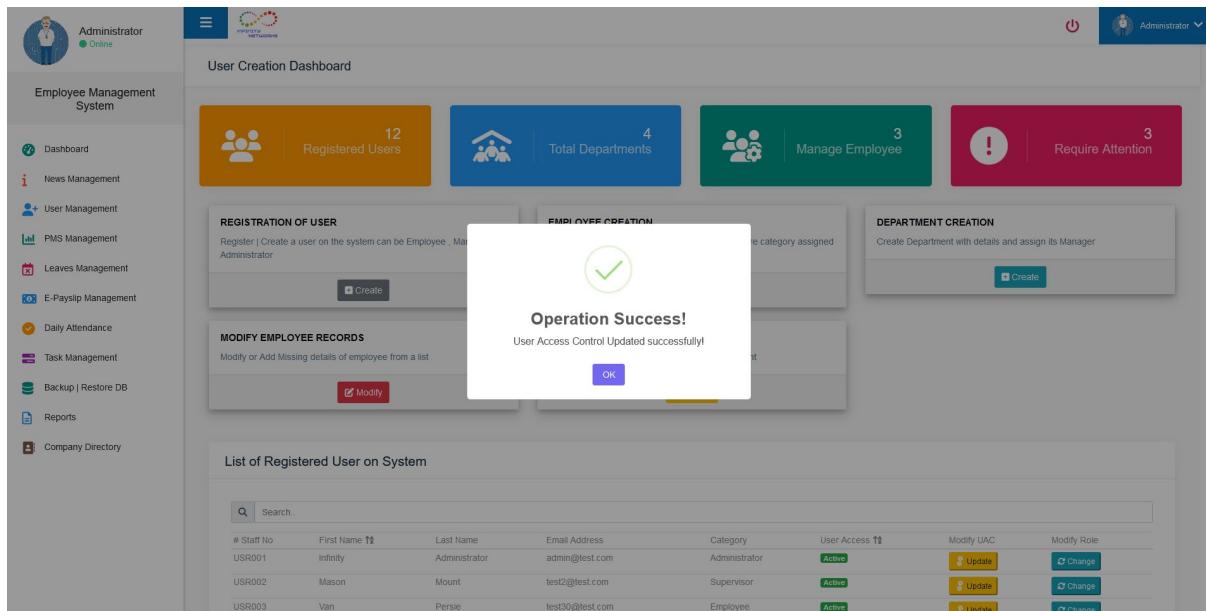


Figure 188 Unit Testing: Revoking User Access

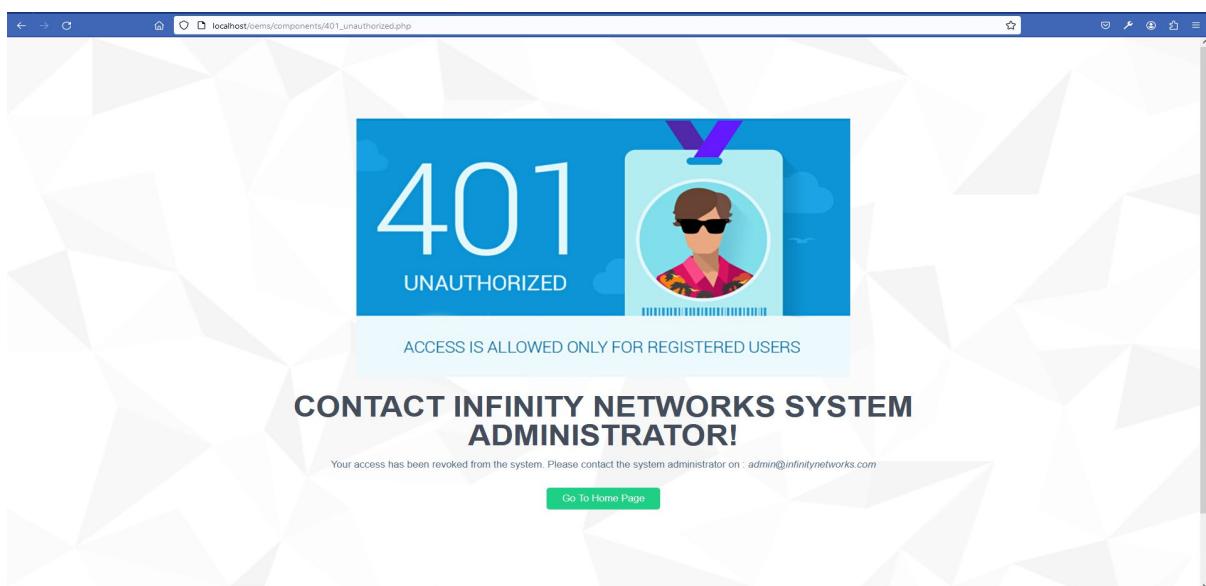


Figure 189: Revoked User Access Message Displayed

**Expected Outcome:** 401 Unauthorized page displayed after employee tried to access system, system effectively manages unauthorized access attempts and guides users on the appropriate course of action.

**TEST 5:** Verify if payslip deductions is being automatically calculated by system.

**How to replicate:**

- Click on E-Payslip Management Page
- Click on Manage → Create Payslip
- Input fields, “Overtime or Bus fare”,
- System should automatically calculate the Net Pay, Deductions and Gross Pay.

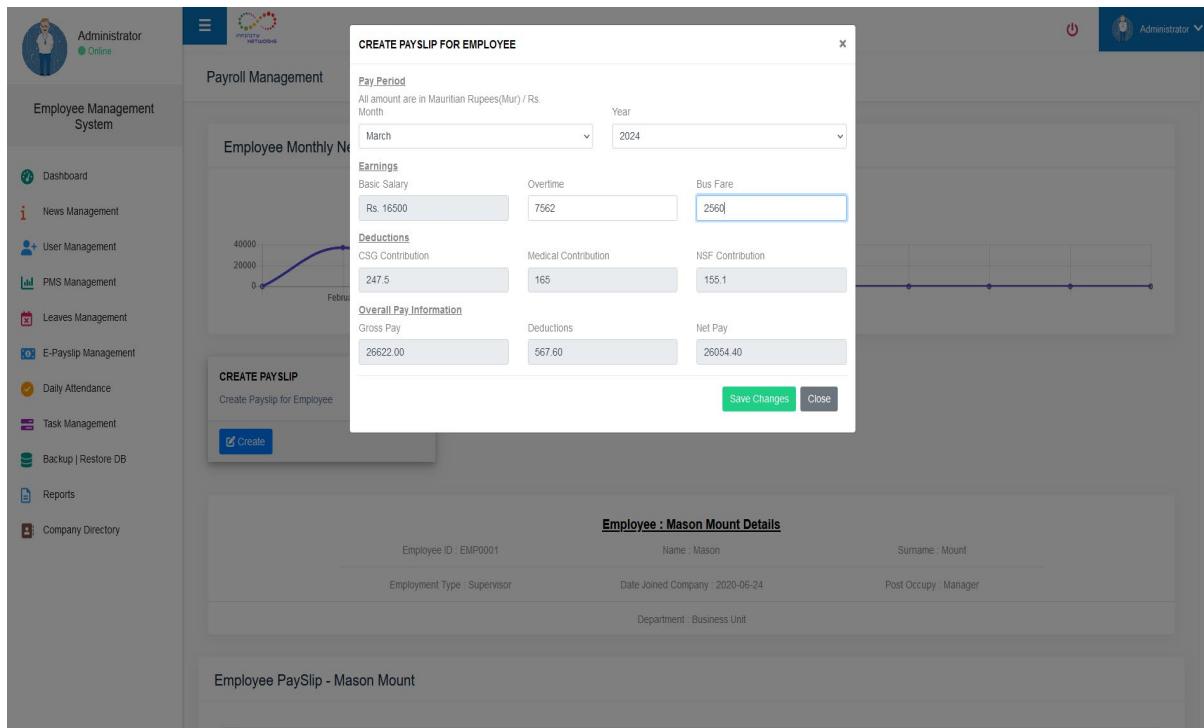


Figure 190 Unit Testing: System automated calculations

**Expected Outcome:** system effectively calculates the deductions, net pay and gross pay upon user inputs required data for processing, Figure 178 is the evidence.

### 9.18.3 Integration Testing

Individual software components are conceptually connected and tested collectively during integration testing.

It is to see if the expected outcome matches the test case description.

#### TEST 1: Verify if user created as employee is found on dropdown list for employee registration

##### How to replicate:

- Click on User Management Page
- Click on Create User → Fill in Details (We are Going to use: Eric Cantona) and Select Category as “Employee”.
- Submit Form
- Now navigate to Employee Creation → Create → It should display Eric Cantona as Employee.

User Creation onto Infinity Networks System

Email address: eric@test.com

Password: \*\*\*\*\*

Category: Employee

Name: Eric

Surname: Cantonna

Submit Cancel

Figure 191 Integration Testing: Create User

Create Employee on System

Employee Management System

Administrator Online

Create Employee on System

Employee Registration Form

Select Employee From Dropdown List

Test Again  
Jeff Bezos  
Jose Mourinho  
Eric Cantonna

Mauritan NIC(MIC)

Mobile number

Phone number

Residential Address

Emergency Contact Person

Emergency Contact Number

Date Joined Company

Highest Educational qualification

Figure 192: Displays user as Employee

**Expected Outcome:** After user is created as employee, user Eric Cantonna can be seen displayed in dropdown list as employee.

**TEST 2: Verify if employee leave balances is automatically displayed when employee requesting a leave application**

**How to replicate:**

- Click on Absence Management Page
- Click on Create Leave → Fill in Details and Select Leave type.
- It should automatically display the employee leave balance for leave he or she has selected.

The screenshot shows a web-based application window titled 'CREATE LEAVE FOR EMPLOYEE'. Under the 'Leave Type' section, 'Sick Leave' is selected. Below it, the text 'Sick Leave Balance: 22' is displayed. The 'Select Start Date and End Date' section contains two date input fields. The 'Leave Reason' section is empty. At the bottom right are 'Save Changes' and 'Close' buttons.

Figure 193 Integration Testing: Displays Employee Leave balance

If Leave is exhausted system displays warning message and leave balance.

The screenshot shows the same application window. This time, 'Wellness Leave' is selected in the 'Leave Type' dropdown. The 'Wellness Leave Balance: 0' message is shown below. The 'Start Date' is set to 20/02/2024 and the 'End Date' is set to 29/02/2024. A modal dialog box appears in the center, stating 'Leave duration cannot be greater than available balance for wellness' with 'OK' and 'Details' buttons. The original 'Save Changes' and 'Close' buttons are still visible at the bottom right.

Figure 194 System displays message to inform employee

**Expected Outcome:** System performs correctly and informs employee for each leave selected if balance is 0, no further processing is done by system.

### **TEST 3: Verify if leave is being deducted from employee leave balance after leave is being approved**

#### **How to replicate:**

- Click on Absence Management Page
- Click on Create Leave → Fill in Details and Select Leave type.
- It should automatically display the employee leave balance for leave he or she has selected.
- Now, the Administrator will check if the leave balance has been deducted via the employee management dashboard, it will display on top of the screen, this process is automated, hence require no additional user input.

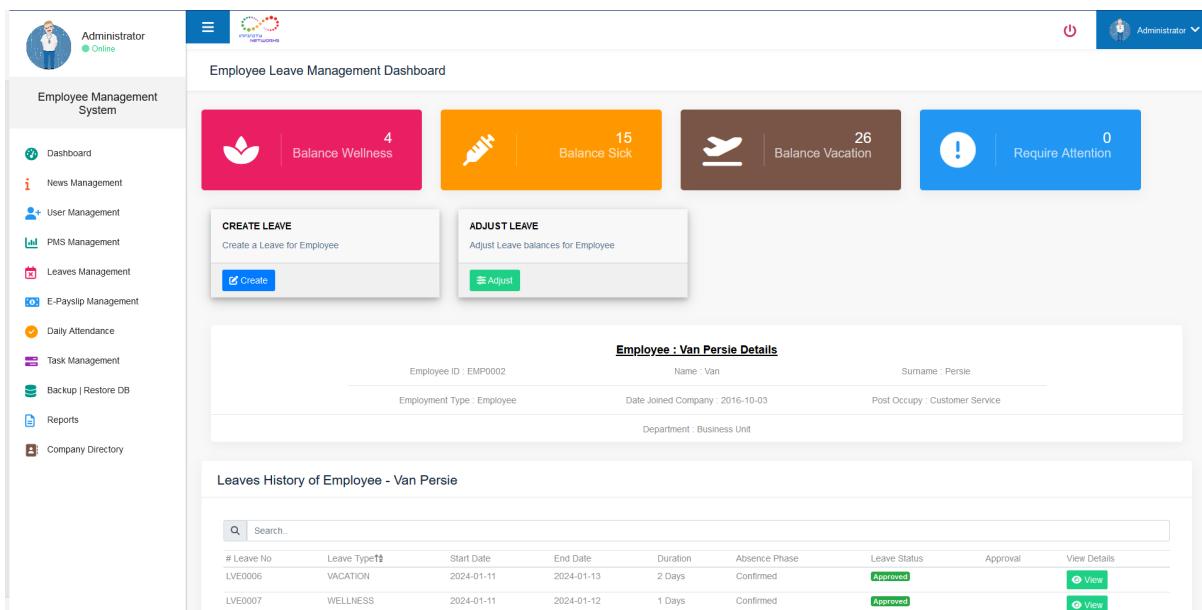


Figure 195 Integration Testing: Leave Balance Before

Creating a Leave, using case Vacation Leave for 1 day.

The 'CREATE LEAVE FOR EMPLOYEE' dialog box contains the following fields:

- Leave Type:** Vacation Leave
- Vacation Leave Balance:** 27
- Select Start Date and End Date:**
  - Start Date: 22/02/2024
  - End Date: 23/02/2024
- Total Leave Duration:** Duration: 1 days
- Leave Reason:** Test 3: Verify if the Leave is being deducted
- Buttons:**
  - Save Changes
  - Close

Figure 196 Integration Testing: Creating a Leave

Vacation Leave Balance has been deducted successfully by the system in an automated process guaranteeing the integrity of the system as per below Figure

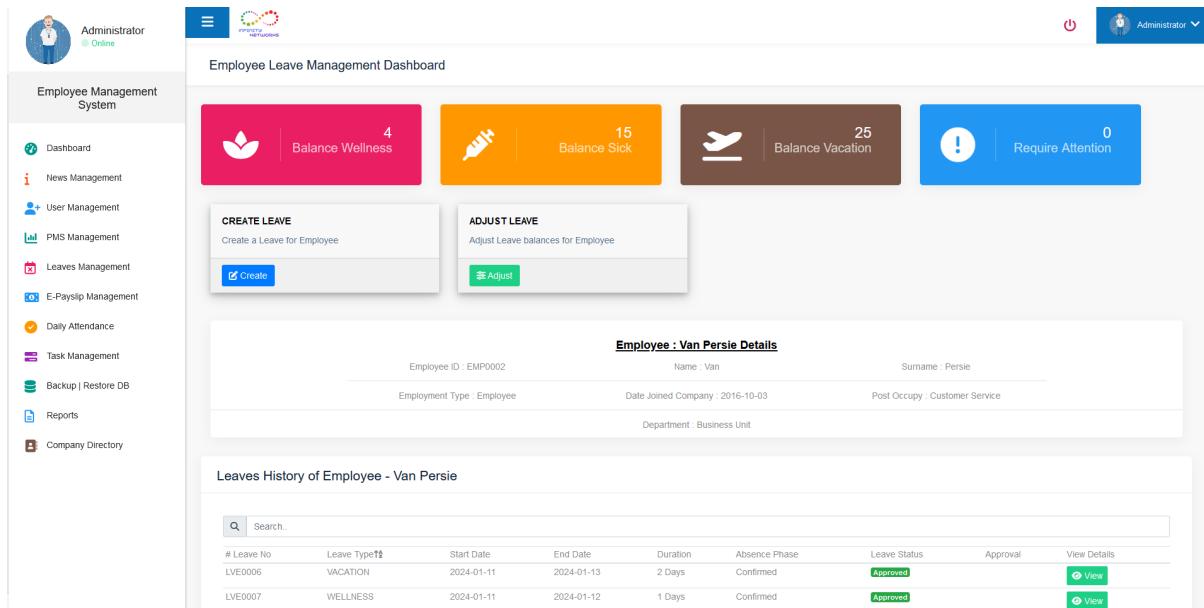


Figure 197 Integration Testing: Leave Balance After

**Expected Outcome:** The system has effectively deducted the balance of vacation leave through an automated process, ensuring the integrity of the system, as depicted in the following illustration, Figure 185.

#### **TEST 4: Verify if pms is being updated during each phase of the pms evaluation**

##### **How to replicate:**

- Click on Pms Management Page
- Click on Create PMS → Fill in Details.
- It should automatically update pms history of employee and display its current status.
- System sets the Pms Status to “Pending at Employee”

Figure 198 Integration Testing: Create Employee PMS

Once PMS has been created the PMS status is set to “Pending at Employee”.

The screenshot shows the Employee Management System dashboard. At the top, there are four status cards: 'PMS Completed' (1), 'PMS Active' (1), 'Pending Approval' (0), and 'Require Attention' (0). Below these is a 'CREATE PMS' button. The main section displays 'Employee : Van Persie Details' for Employee ID EMP0002, with fields for Name (Van), Surname (Persie), Employment Type (Employee), Date Joined Company (2016-10-03), Post Occupy (Customer Service), and Department (Business Unit). Below this is a 'History of Employee PMS - Van Persie Metrics' table:

# PMS No	PMS Period	Year   Months	PMS Phase	Status	Modify Status	Modify PMS Entry	Score Entry	View PMS
PMS0002	Quarter 1	2023-12-07	Completed	Score Updated				
PMS0008	Quarter 2	2024-02-22	Pending at Employee	Objectives Created				

Figure 199 Integration Testing: Pending at Employee

After Employee has updated his metrics the pms status is set to “Pending at Supervisor”.

The screenshot shows the Employee Management System dashboard. The status cards remain the same: 'PMS Completed' (1), 'PMS Active' (0), 'Pending Approval' (1), and 'Require Attention' (1). The 'Employee : Van Persie Details' section is identical to Figure 199. The 'History of Employee PMS - Van Persie Metrics' table now shows the status as 'Pending at Supervisor' for the second row:

# PMS No	PMS Period	Year   Months	PMS Phase	Status	Modify Status	Modify PMS Entry	Score Entry	View PMS
PMS0002	Quarter 1	2023-12-07	Completed	Score Updated				
PMS0008	Quarter 2	2024-02-22	Pending at Supervisor	Metrica Updated				

Figure 200 Integration Testing: Pending at Supervisor

The final step is input from supervisor which is required to close the PMS flow, supervisor inputs the scores and the system automatically updates the PMS.

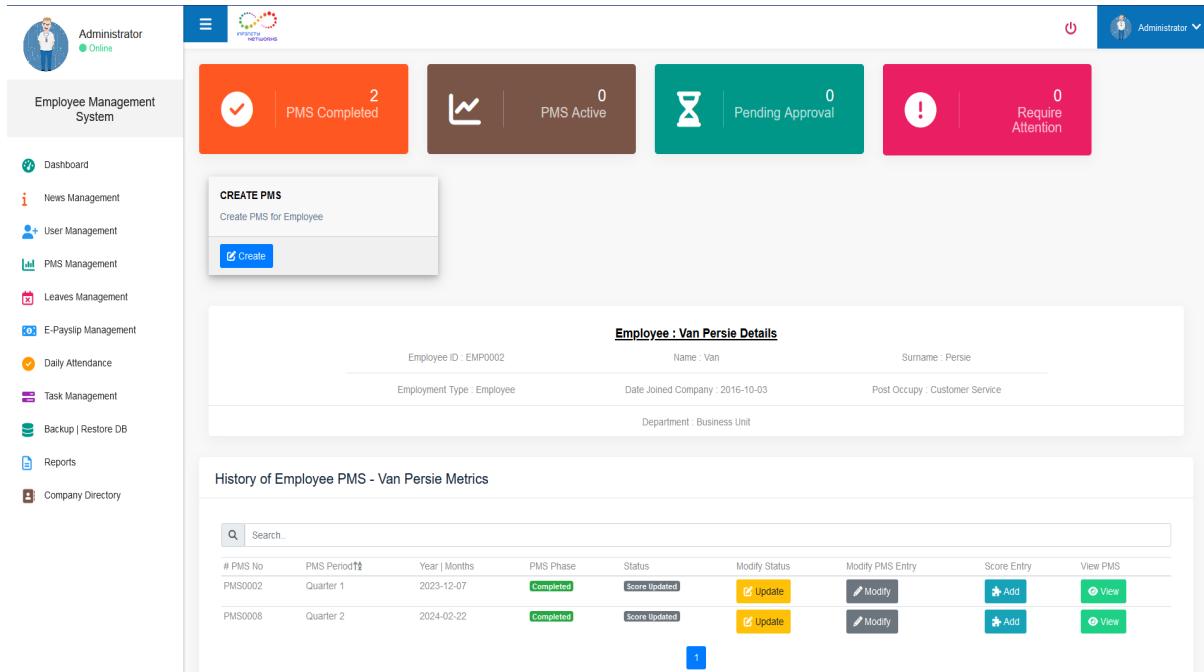


Figure 201 Integration Testing: PMS Completed

**Expected Outcome:** The system successfully manages the flow of correct information for each step of the PMS process, ensuring that the appropriate data is updated automatically as required.

#### 9.18.4 System Testing

Now, the entire system will undergo comprehensive testing to ensure its functionality and performance as a cohesive unit.

#### TEST 1: Verify if task is being displayed to employee when same is created by supervisor

##### How to replicate:

- Click on Task Management Page
- Click on Create Task → Fill in Details → Assign to Employee

The screenshot shows the "CREATE TASK AND ASSIGN TO EMPLOYEE" form with the following fields:

- Task Name:** System Testing
- Task Description:** Verifying if Task is successfully created and assigned to employee
- Set Deadline:** 25/02/2024
- Assign To:** Van Persie

At the bottom are two buttons: **Create Task** (green) and **Close**.

Figure 202 System Testing: Creating a Task and assign to employee

The employee accesses the dashboard and navigates to the task section. The system retrieves and displays all tasks assigned to the employee, allowing them to view the details of each task. If no tasks are assigned, the system presents an appropriate message. The employee interacts with the tasks as required, and the system updates task statuses based on the employee's actions.

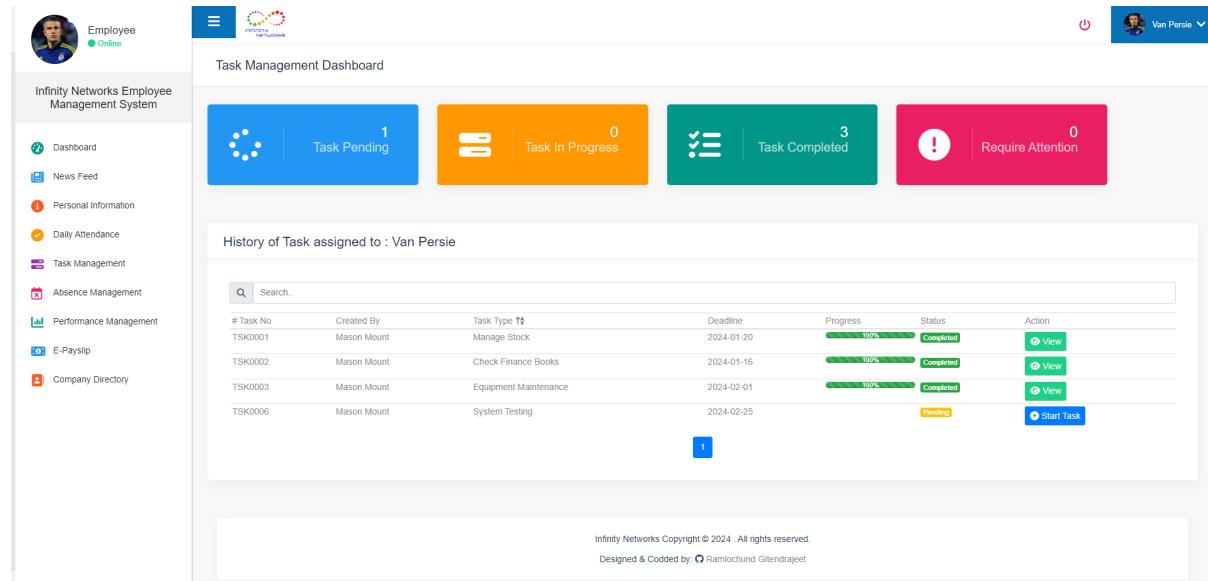


Figure 203 System Testing: Employee view task assign to him

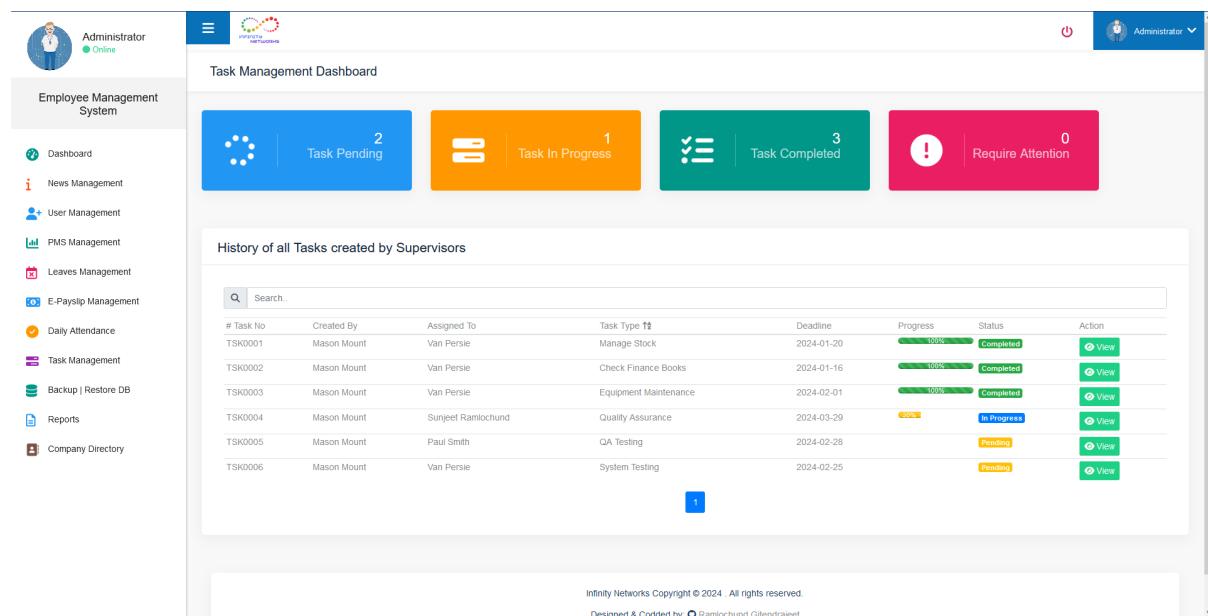


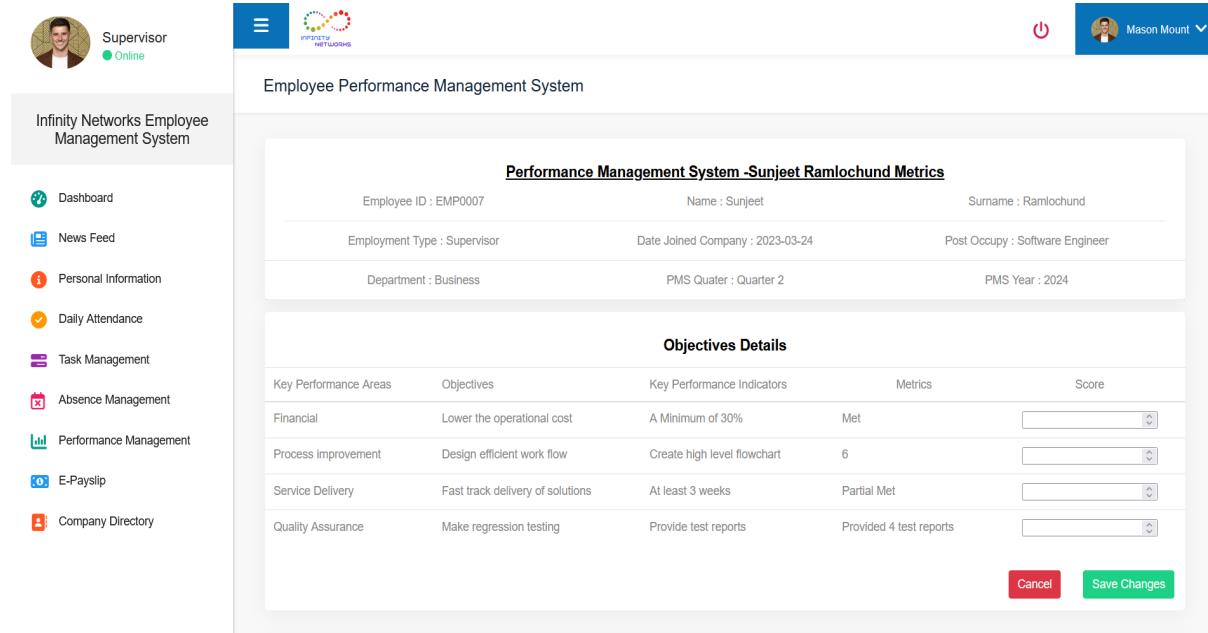
Figure 204 System Testing: System updates Administrator dashboard for task

**Expected Outcome:** The system demonstrates proficiency in managing tasks by efficiently handling the creation, assignment, and updating of tasks.

**TEST 2:** Verify if pms is being automatically being handled and calculated by the system and displayed to employee

### How to replicate:

- Click on PMS Management Page
- Click on Create PMS → Fill in Details → Employee Input Metrics → Supervisor Inputs Scores



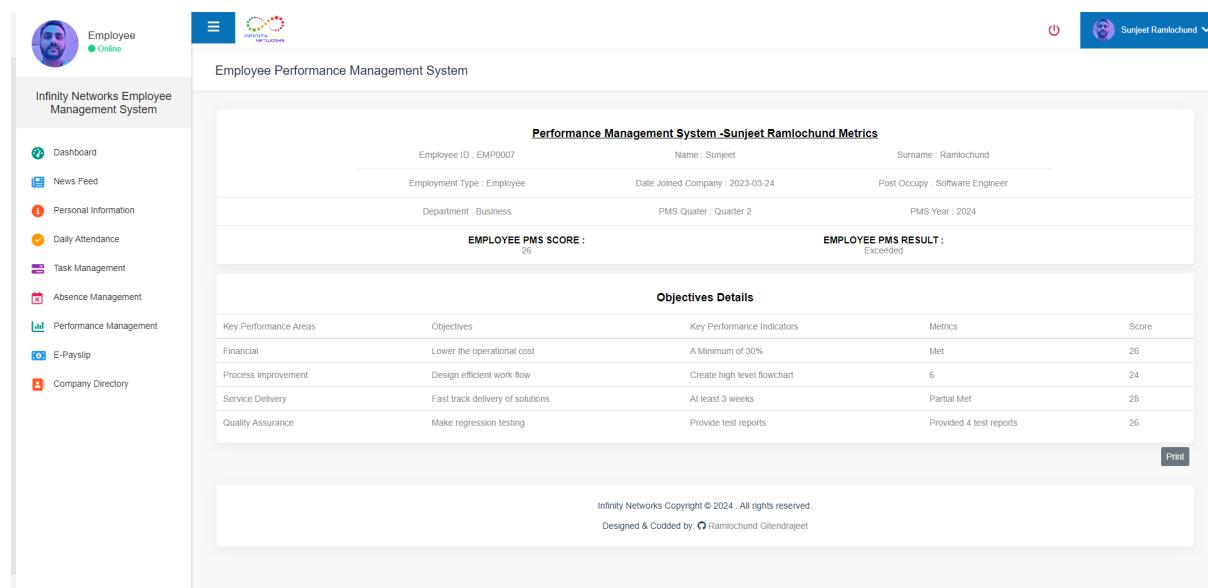
The screenshot shows the 'Employee Performance Management System' interface. On the left, there's a sidebar with a user profile (Supervisor, Online), the system name, and various menu items: Dashboard, News Feed, Personal Information, Daily Attendance, Task Management, Absence Management, Performance Management, E-Payslip, and Company Directory. The main content area has a header 'Performance Management System -Sunjeet Ramlochund Metrics'. It displays basic employee information: Employee ID: EMP0007, Name: Sunjeet, Surname: Ramlochund, Employment Type: Supervisor, Date Joined Company: 2023-03-24, Post Occupy: Software Engineer, Department: Business, PMS Quater: Quarter 2, and PMS Year: 2024. Below this is a section titled 'Objectives Details' with a table:

Key Performance Areas	Objectives	Key Performance Indicators	Metrics	Score
Financial	Lower the operational cost	A Minimum of 30%	Met	<input type="text"/>
Process Improvement	Design efficient work flow	Create high level flowchart	6	<input type="text"/>
Service Delivery	Fast track delivery of solutions	At least 3 weeks	Partial Met	<input type="text"/>
Quality Assurance	Make regression testing	Provide test reports	Provided 4 test reports	<input type="text"/>

At the bottom right are 'Cancel' and 'Save Changes' buttons.

Figure 205 System Testing: Supervisor Input Scores

- Employee logs onto system and click on PMS Management → View PMS → System has automatically calculated and displayed pms result of employee.



The screenshot shows the 'Employee Performance Management System' interface from the employee perspective. The sidebar and basic employee info are similar to the supervisor view. The main content area has a header 'Performance Management System -Sunjeet Ramlochund Metrics'. It displays the same basic information and includes sections for 'EMPLOYEE PMS SCORE : 26' and 'EMPLOYEE PMS RESULT : Exceeded'. Below this is the 'Objectives Details' table:

Key Performance Areas	Objectives	Key Performance Indicators	Metrics	Score
Financial	Lower the operational cost	A Minimum of 30%	Met	26
Process improvement	Design efficient work flow	Create high level flowchart	6	24
Service Delivery	Fast track delivery of solutions	At least 3 weeks	Partial Met	28
Quality Assurance	Make regression testing	Provide test reports	Provided 4 test reports	26

At the bottom right is a 'Print' button.

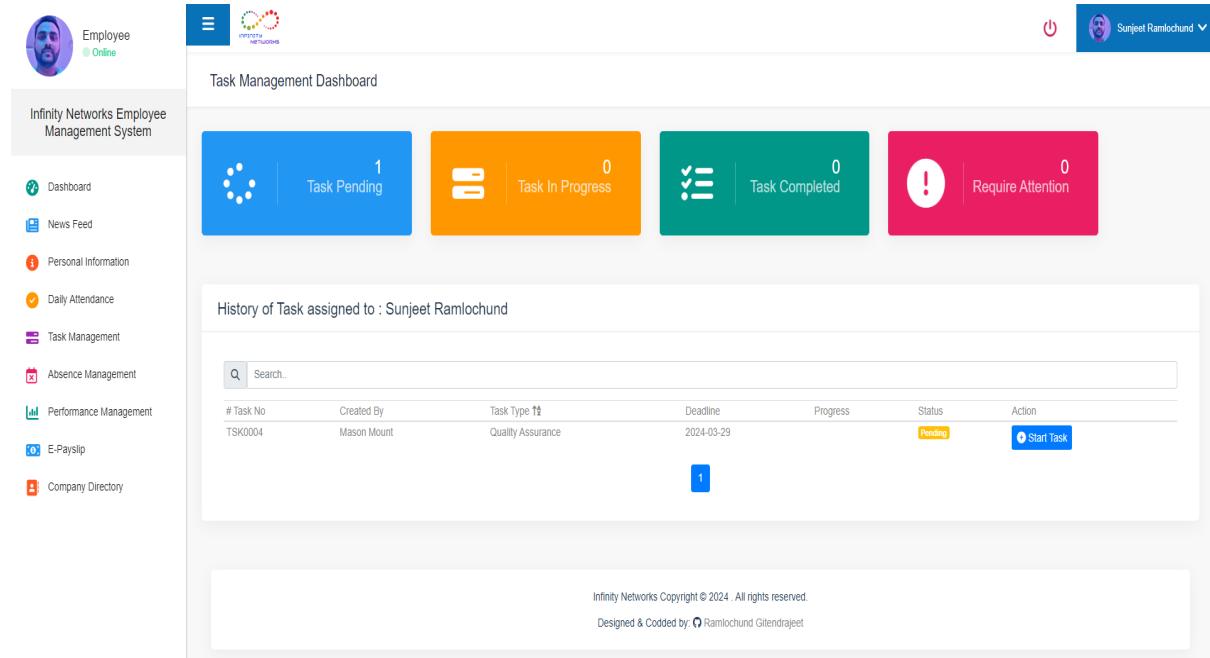
Figure 206 System Testing: Employee View PMS

**Expected Outcome:** The system has demonstrated its capability to successfully handle interactions between supervisors and employees, ensuring that data is accurately set and updated as required.

### **TEST 3: Verify if system is being able to hide button depending on events**

#### **How to replicate:**

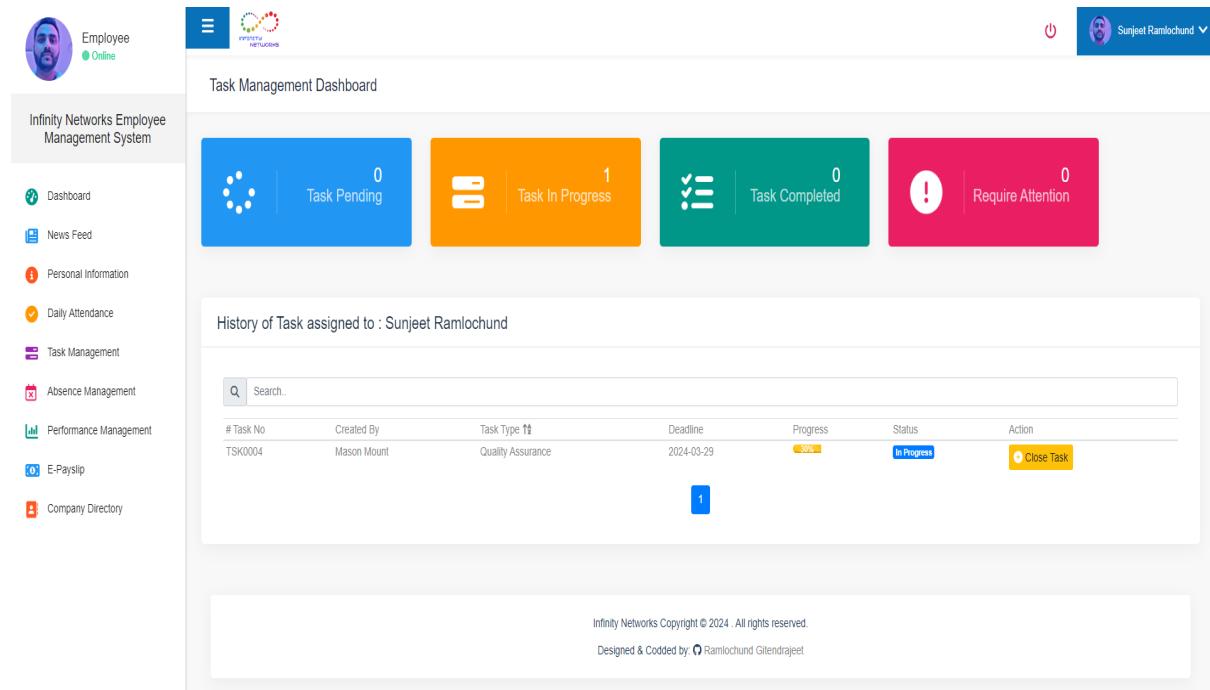
- Click on Task Management Page
- I am using case where employee is going to view his task assigned to him and fill start the task and close task.



The screenshot shows the Task Management Dashboard for the Infinity Networks Employee Management System. The dashboard features four colored boxes: blue (Task Pending: 1), orange (Task In Progress: 0), green (Task Completed: 0), and red (Require Attention: 0). Below the dashboard is a section titled "History of Task assigned to : Sunjeet Ramlochund" containing a table with one row of data. The table columns are: # Task No, Created By, Task Type, Deadline, Progress, Status, and Action. The data row is: TSK0004, Mason Mount, Quality Assurance, 2024-03-29, 0%, Pending, and a blue "Start Task" button. At the bottom of the page, there is a copyright notice: "Infinity Networks Copyright © 2024. All rights reserved. Designed & Codded by: Sunjeet Ramlochund Gitendrajeet".

Figure 207 System Testing: Start Button based on Event

Upon the task is started, the system automatically handles the event and button changes state to close task. When employee has completed the task, he inputs the details and add feedback to the task.



The screenshot shows the Task Management Dashboard for the Infinity Networks Employee Management System. The dashboard features four colored boxes: blue (Task Pending: 0), orange (Task In Progress: 1), green (Task Completed: 0), and red (Require Attention: 0). Below the dashboard is a section titled "History of Task assigned to : Sunjeet Ramlochund" containing a table with one row of data. The table columns are: # Task No, Created By, Task Type, Deadline, Progress, Status, and Action. The data row is: TSK0004, Mason Mount, Quality Assurance, 2024-03-29, 100%, In Progress, and a yellow "Close Task" button. At the bottom of the page, there is a copyright notice: "Infinity Networks Copyright © 2024 . All rights reserved. Designed & Codded by: Sunjeet Ramlochund Gitendrajeet".

Figure 208 System Testing: Close Button based on Event

Employee the close the task by submitting the required details, system automatically handles the close task event which changes state and a view button is displayed.

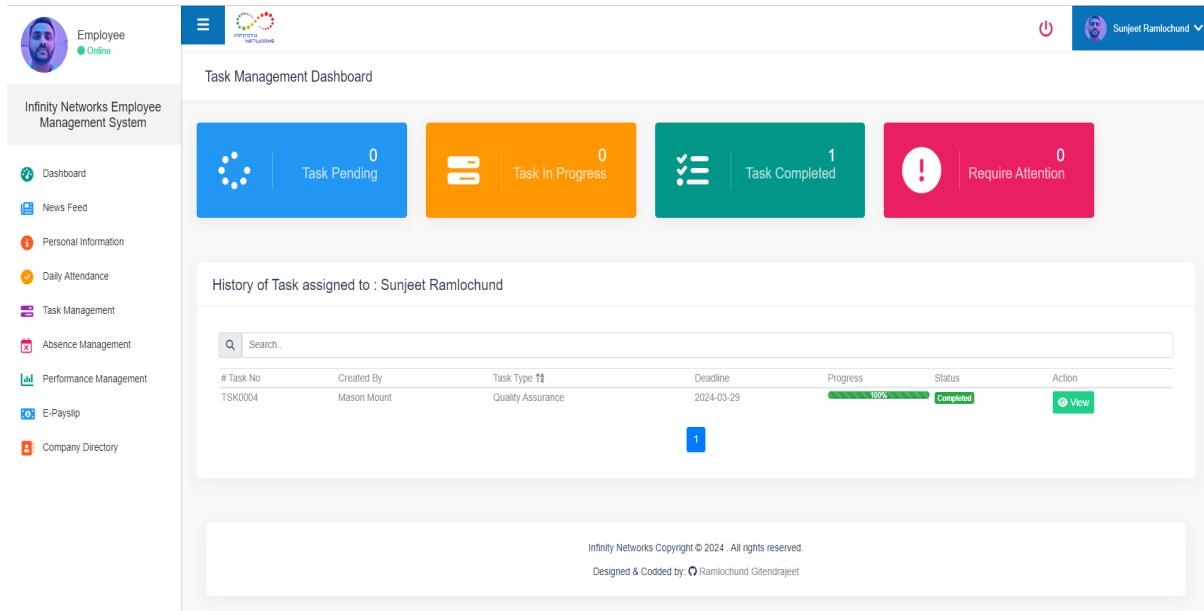


Figure 209 System Testing: View Button based on Event

**Expected Outcome:** The system smoothly manages various real-time events, such as task events. For instance, it accurately displays three types of buttons based on programmed criteria, ensuring updated information is consistently presented.

## 9.19 BACKUP OF DATA IN OEMS

The backup process for OEMS involves regularly duplicating and storing the system's database to ensure data integrity and availability in case of unforeseen events such as hardware failures, data corruption, or accidental deletions. This process typically includes creating a copy of the database structure and its contents, usually in SQL format, and storing it securely either locally or on a remote server. By performing regular backups, OEMS can minimize the risk of data loss and maintain business continuity, ultimately safeguarding critical organizational information.

### SQL Backup

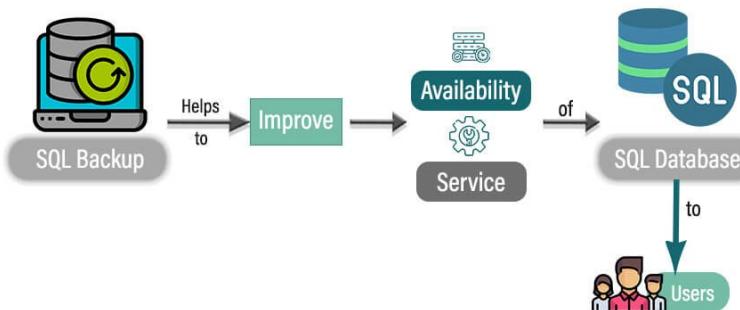


Figure 210: Backup in OEMS

### 9.19.1 Using Full Backup for OEMS

OEMS is utilizing a full data backup approach, where the entire database, including its structure and contents, is duplicated and stored. This comprehensive backup strategy ensures that all critical data within the system is protected and can be restored in its entirety if needed.

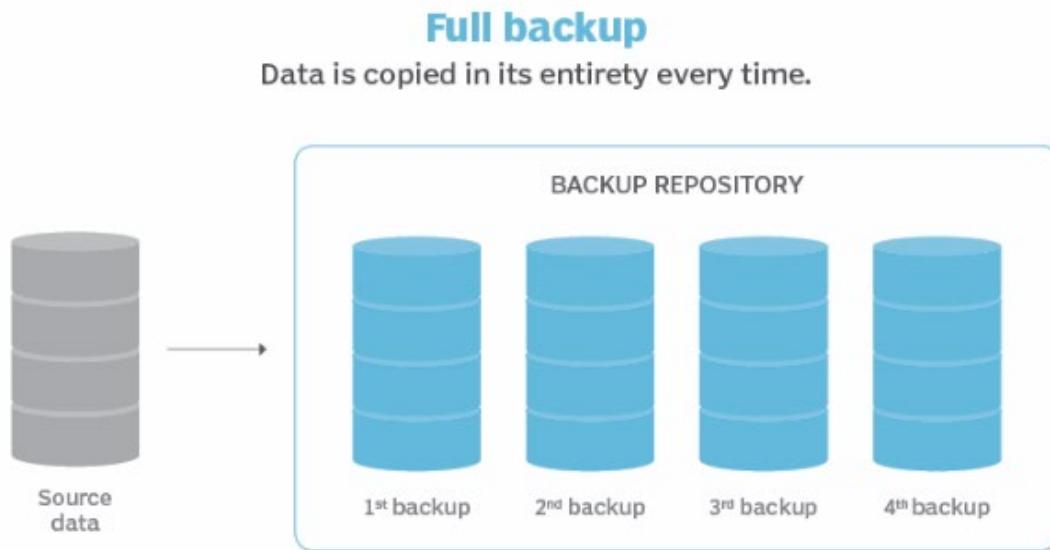


Figure 211: OEMS Using Full Backup Approach

### 9.19.2 Designing Script to Back up the database on one go

This backup code creates a copy of all the important information stored in the OEMS system, like employee details and task assignments. It does this by connecting to the system's database and collecting data from all the different parts of the system.

```
backupSQL.php >
C: > xampp > htdocs > OEMS > controller > exports > backupSQL.php
1  <?php
2  //Name:RAMLOCHUND Gitendrajeet
3  //Project: OEMS Infinity Networks
4  //Scope: BACKUP SCRIPT / SQL Format
5  // Database configuration
6  $host = "localhost";
7  $username = "root";
8  $password = "";
9  $database_name = "oems";
10
11 // Get connection object and set the charset
12 $conn = mysqli_connect($host, $username, $password, $database_name);
13 $conn->set_charset("utf8");
14
15
16 // Get All Table Names From the Database
17 $tables = array();
18 $sql = "SHOW TABLES";
19 $result = mysqli_query($conn, $sql);
20
21 while ($row = mysqli_fetch_row($result)) {
22     $tables[] = $row[0];
23 }
24
25 $sqlScript = "";
26 foreach ($tables as $table) {
27
28     // Prepare SQLscript for creating table structure
29     $query = "SHOW CREATE TABLE $table";
30     $result = mysqli_query($conn, $query);
31     $row = mysqli_fetch_row($result);
32
33     $sqlScript .= "\n\n" . $row[1] . ";\n\n";
34
35
36     $query = "SELECT * FROM $table";
37     $result = mysqli_query($conn, $query);
```

Figure 212: Script to perform Full Back up in OEMS

This script handles the backup process for the database used in OEMS. Firstly, it configures the database connection by specifying the host, username, password, and database name. Then, it establishes a connection to the MySQL database using these configuration variables. Next, it retrieves the list of tables in the database and stores them in an array.

For each table, it generates SQL commands to recreate the table structure and insert the table data. These commands are appended to a variable called \$sqlScript. If there is data to backup, the script creates a backup file with a unique name based on the current timestamp.

This backup file is then downloaded to the user's browser using PHP's header functions to set the appropriate content type and file name, and readfile() to output the file contents.

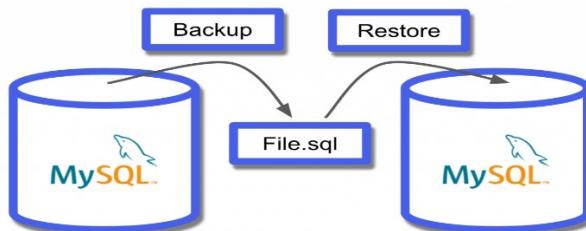


Figure 213: Backup OEMS using SQL Format

### 9.19.3 Saving backup file with database name and timestamp

The script saves the backup file with a name that contains the timestamp and the name of the database. This guarantees that every backup file has a distinct name and is easily recognizable. In order to distinguish the filename and aid in backup organization chronologically, a timestamp is appended to it. When necessary, backup files may be easily managed and retrieved thanks to this naming standard.

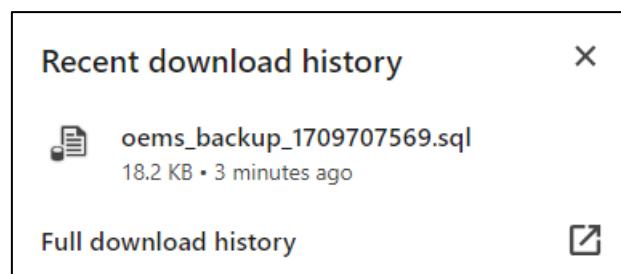


Figure 214: Backup in SQL Format with timestamp

## 9.20 IMPLEMENTATION OF SYSTEM

The most optimal deployment strategy for OEMS would be in a dedicated data centre, offering robust architecture and security measures while avoiding Infinity Networks maintenance fees. The servers would be located within a colocation facility, ensuring:

- 24/7 access to services
- Monitoring redundancies for reliability
- Local network accessibility
- Enhanced security and compliance measures.

Figure 198 is the deployment diagram for OEMS on a managed service datacentre.

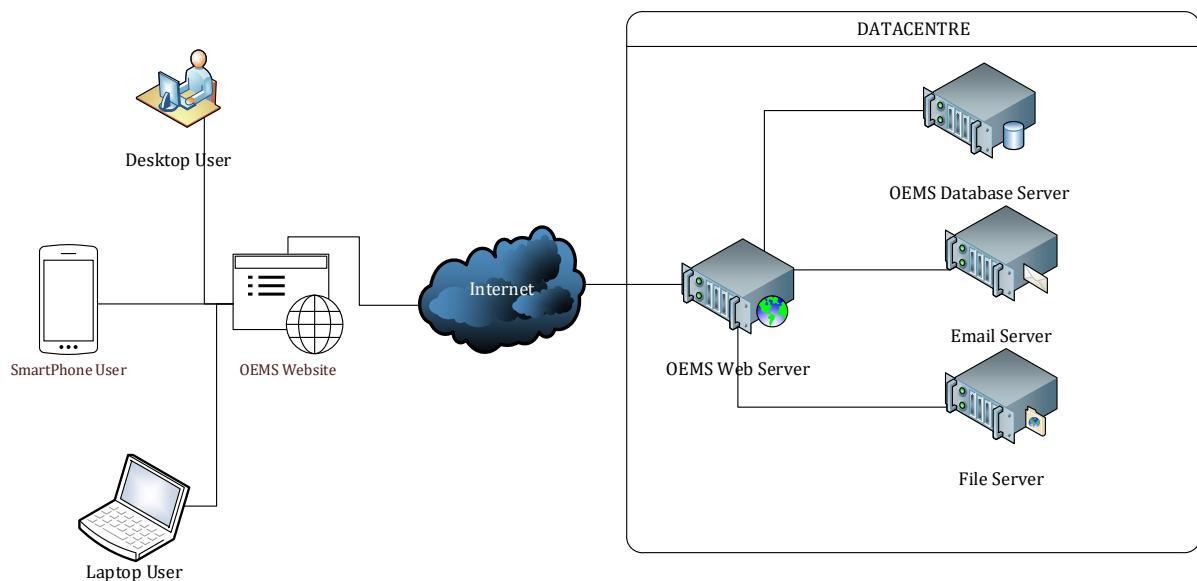


Figure 215: Deployment at a Datacentre

### 9.20.1 Other Deployment Strategies for OEMS

Some of the deployment strategies that can be employed to deploy OEMS are:

- Cloud Deployment: Hosting the application on cloud platforms like AWS, Azure, or Google Cloud for scalability, flexibility, and cost-effectiveness.
- On-Premises Deployment: Installing and running the application on servers within the organization's own premises, providing full control over hardware and software resources.
- Hybrid Deployment: Combining elements of both cloud and on-premises deployment to leverage the benefits of both approaches, such as keeping sensitive data on-premises while using cloud services for scalability.
- Managed Hosting: Utilizing managed hosting services where a third-party provider handles the infrastructure management, allowing the organization to focus on application development and usage.
- Containerized Deployment: Packaging the application and its dependencies into containers using technologies like Docker and deploying them across different environments consistently.

## 9.21 DEPLOYMENT OF OEMS THROUGH CLOUD (AWS)

### 9.21.1 Creating a EC2 Machine with OS

OEMS has been deployed over Cloud, using AWS as cloud provider, below the documented steps that have been followed for a proper deployment using an Amazon EC2 instance with Windows Server 2022:

1. **Sign in to AWS:** Go to AWS Management Console (<https://console.aws.amazon.com/>) and sign with AWS account.
2. **Launch Instance:** In the EC2 Dashboard, click "Launch Instance".
3. **Choose AMI (Amazon Machine Image):**
  - Select the "AWS Marketplace" tab.
  - Search for "Windows Server 2022 Base" and choose the appropriate AMI provided by Microsoft and Click "Select"

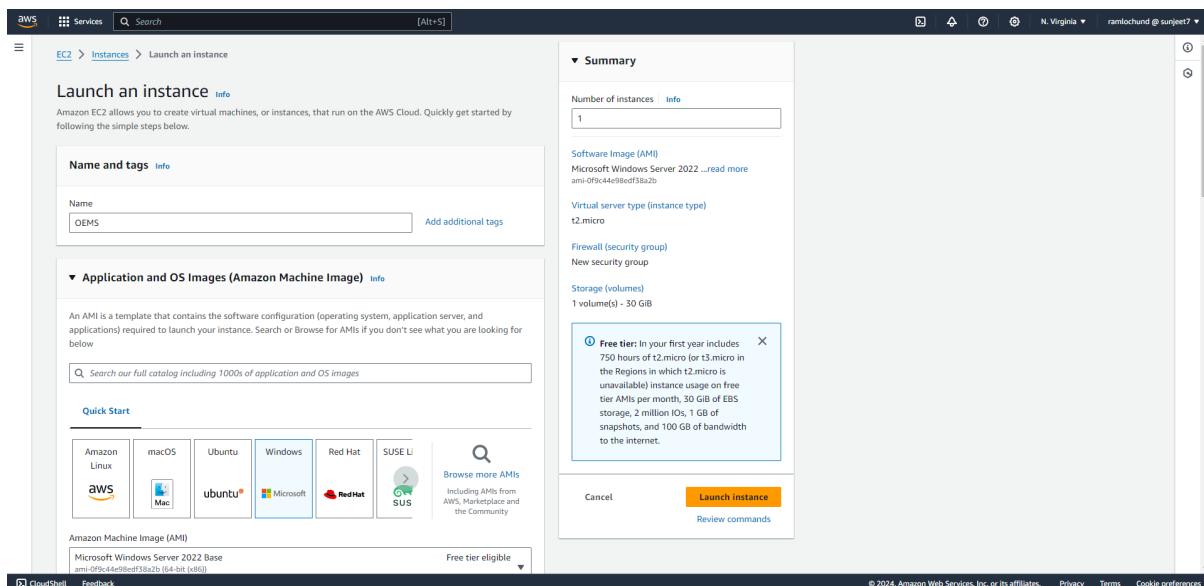


Figure 216: Creating EC2 Instance

4. **Choose Instance Type:** Choose an instance type (e.g., t2.micro) and click "Next".
5. **Configure Instance Details:** Leave the default settings, then click "Next".
6. **Add Storage:** Leave the default settings then click "Next".
7. **Configure Security Group:**
  - Create a new security group or select an existing one.
  - Click "Review and Launch".
8. **Review Instance Launch:** Review your settings and click "Launch".
9. **Create a Key Pair:**
  - Create a new one.
  - Download the key pair file (\*.pem) and Click "Launch Instances".

### 9.21.2 Configure Inbound and Outbound for EC2

In this step I am going to configure the EC2 inbound and outbound traffic rules for the ec2 to be accessible through the internet.

- 1. Sign in to the AWS Management Console:** Go to <https://console.aws.amazon.com/> and sign in with AWS account.
- 2. Navigate to EC2 Dashboard:** Click on the "Services" dropdown menu at the top left corner of the AWS Management Console, and then select "EC2" under the "Compute" section.
- 3. Select Security Groups:** In the EC2 Dashboard, select "Security Groups" from the navigation pane on the left.
- 4. Choose the Security Group:** Select the security group associated with the EC2 instance to configure.

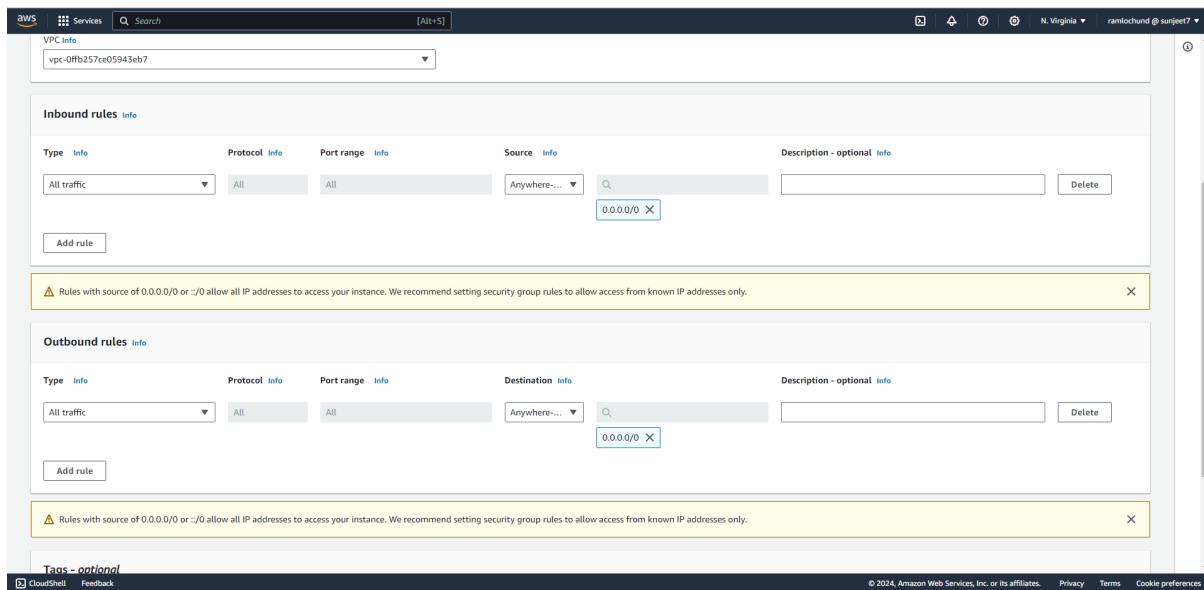


Figure 217: Configuring the Inbound and Outbound Security

- 5. Inbound Rules:** To configure inbound rules (incoming traffic):
  - Click on the "Inbound rules" tab then Click the "Edit inbound rules" button.
  - Click the "Add rule" button and select the type of traffic to allow (e.g., HTTP, HTTPS, RDP) and Select Type: "All Traffic" and Click "Save rules"
- 6. Outbound Rules:** To configure outbound rules (outgoing traffic):
  - Click on the "Outbound rules" tab, Click the "Edit outbound rules" button.
  - Click the "Add rule" button.
  - Choose the type of traffic to allow (e.g., All traffic, HTTP, HTTPS) and Select Type: "All Traffic" and Click "Save rules."

### 9.21.3 Launching and Deploying the Web application over the EC2

In this step I am going to launch the EC2 and deploy the web application to be accessible through the internet.

#### 1. Launch an EC2 Instance:

- Sign in to AWS Management Console and navigate to the EC2 service.
- Launch a new EC2 instance with a Windows Server operating system.

#### 2. Connect to EC2 Instance:

- Connect to EC2 instance using Remote Desktop Protocol (RDP) with the provided public IP address and administrator credentials.

#### 3. Download and Install XAMPP:

- Download the latest version of XAMPP for Windows from the Apache Friends website (<https://www.apachefriends.org/index.html>).
- Run the XAMPP installer on the EC2 instance and follow the installation instructions.

#### 4. Start XAMPP Services:

- Once XAMPP is installed, launch the XAMPP Control Panel and start the service

#### 5. Configure Apache for the Web Application:

- Place the web application files in the appropriate directory within the XAMPP installation directory (typically **C:\xampp\htdocs**).

#### 6. Test the Web Application:

- Open a web browser on the local machine and enter the public IP address of the EC2 instance in the address bar , in my case: *http://54.225.10.207/*

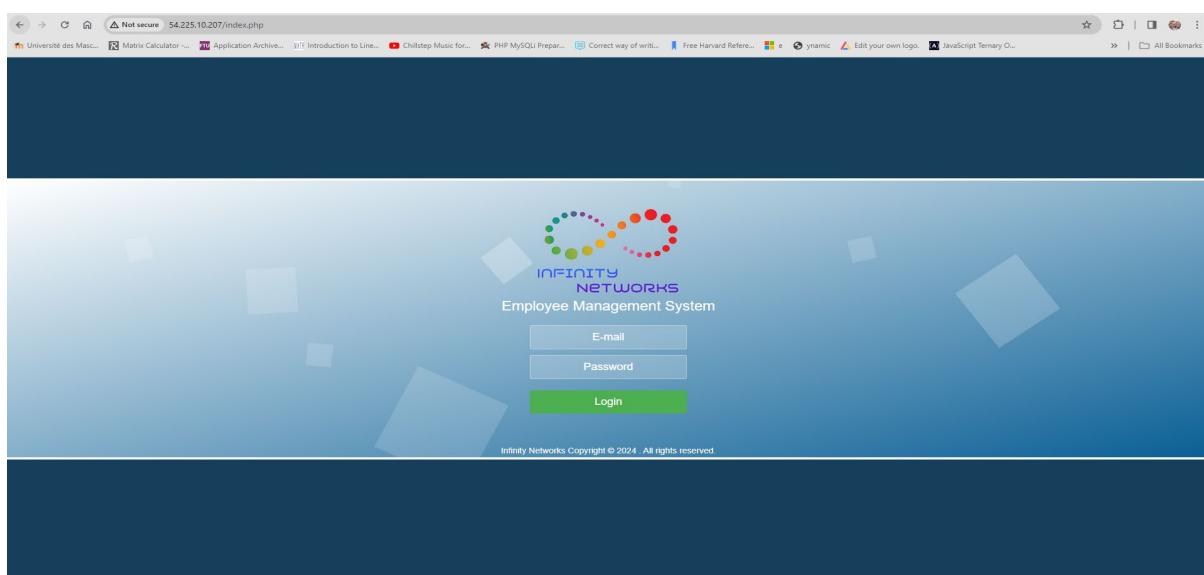
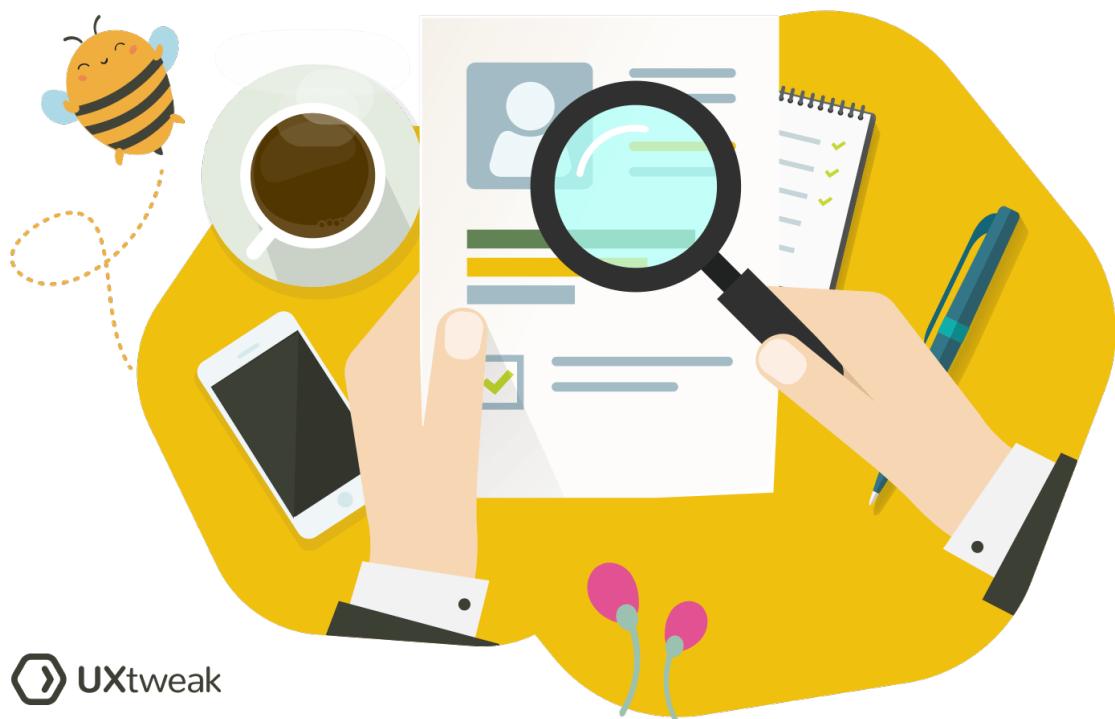


Figure 218: Accessing the Web Application using Public IP Address



## CONCLUSION AND EVALUATION



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## 10 CONCLUSIONS

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As a software engineering student at the university, working on the Online Employee Management System (OEMS) project has been an amazing experience for me. I had many obstacles during the growth process that forced me to increase my knowledge and abilities. Every challenge, from choosing the right technologies to coming up with efficient development plans, offered insightful knowledge and important lessons about the profession of software engineering. I was nevertheless excited about the project's potential to completely transform employee management, even in the face of early obstacles.

Being able to help create a system that is accessible and easy to use was one of the project's most fulfilling parts. I put a lot of effort into making sure OEMS could be used and accessible easily on a variety of platforms, such as PCs and smartphones. The emphasis on mobility not only improved the system's usability but also highlighted how crucial adaptation is to contemporary software development.

As I gained more knowledge about the project, I continued to enhance it and add features to better serve user demands. I was motivated to research cutting-edge technologies and industry best practices for software design and development since each iteration brought new challenges and opportunities for advancement. The excitement of seeing the initiative come to life and the awareness that it would benefit the organization greatly motivated me to overcome obstacles and achieve success.

The mobile app's development did not come without difficulties. It was necessary to carefully organize the procedure, take into account different use cases, and incorporate several functionalities. It requires a thorough understanding of mobile app development ideas and processes as new implementations and upgrades were made.

It takes a detailed grasp of user demands and habits to create a successful mobile app. Delivering a reliable and user-friendly solution depends on careful planning, ongoing input, and flexibility to shifting requirements. The coordination of numerous features and guaranteeing smooth connection with other services, such as Firebase and GitHub, complicated the development process further.

As a result, the Infinity Networks Mobile Solutions app serves as an example for me and also sets a benchmark for myself and the importance of careful preparation, flexibility, and diligence in creating a strong and useful mobile application that efficiently meets the needs of its users. The process from conception to execution demands commitment, knowledge, and tenacity, but the payoff is a priceless tool that boosts productivity and streamlines processes.

An important turning point in my academic and professional career has been finishing the OEMS project. It demonstrates how much I've grown as a software engineer and shows off my capacity to take on challenging issues and provide workable answers. I'm eager to use the skills and knowledge I've gained from this project in my upcoming endeavours and am confident in my ability to make a significant contribution to the software engineering community.

## **11 EVALUATION**

The system boasts a user-friendly interface, ensuring ease of use and accessibility for all users. Its mobile-friendly design enhances user experience, allowing for seamless interaction on various devices. The system accommodates three key actors: the Administrator, Supervisor, and Employee, each equipped to efficiently navigate and engage with the platform. However, users may experience performance issues when accessing the system with a slow internet connection, resulting in delays or unresponsiveness.

The Following requirements Functional and Non-Functional were evaluated as follows:

*Table 28 : Evaluation of FR and NFR*

<b>Functional And Non-Functional Requirements</b>	<b>Target Achieved</b>
User Registration: Ability to register both Employees and Supervisors.	Yes
News Feed Management: Creation, updating, and display of news feed content.	Yes
Performance Management System (PMS): Creation, updating, display, and automated calculation of PMS metrics.	Yes
Task Management: Creation, updating, and assignment of tasks to employees.	Yes
Search and Sorting: Capability to search for and sort data within the system.	Yes
Leave Management: Creation, management, deduction, and updating of leave balances.	Yes
Attendance Recording: Ability to record employee attendance.	Yes
Department Management: Creation, updating, and assignment of departments to employees.	Yes
Payslip Generation: Creation, management, and generation of employee payslips.	Yes
Leave Application and Approval: Ability to apply for and approve leave applications for employees.	Yes
Company Directory: Generation of a directory based on employee details.	Yes
Reporting: Generation and display of reports on employees, tasks, and leaves.	Yes
User Security: Provision of secure user login functionality.	Yes
Backup and Restoration: Ability to back up and restore the entire system database.	Yes
Dashboard Functionality: Performance of all system functions via a comprehensive dashboard interface.	Yes

## 11.1 ADDITIONAL FEATURES

Table 29: Additional Features

Additional Features	Target Achieved
To Export reports data to CSV File	Yes
Host website on Linux	Yes
Security measures have been strengthened by implementing user category-based access controls. If a user attempts to access functionalities outside of their assigned category, the system automatically logs them out to ensure compliance with access restrictions.	Yes
Options to Print reports and PMS Result directly via a printer	Yes
Deployment of Web application over cloud (AWS) accessible through internet.	Yes
Develop a Mobile Application (Work in Progress)	Yes

## 11.2 FUTURE IMPROVEMENT

- Combining machine learning and advanced analytics to provide predictive insights
- Improved security features using cutting-edge encryption and authentication
- Integration of third-party apps and other enterprise systems
- Introduction of virtual assistants and employee self-service portals
- Fully complete the mobile application and integrate it with OEMS CMS

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## 13 GLOSSARY

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**HTML** Hyper Text Markup Language

**HTTP** stands for Hypertext Transfer Protocol an application layer protocol in the Internet protocol suite model for distributed, collaborative, hypermedia information systems

**OOA** Object-Oriented Analysis

**OOD** Object-Oriented Design

**PHP Hypertext Pre-processor:** a widely-used open-source general-purpose scripting language that is especially suited for web development and can be embedded into HTML.

**OEMS** Online Employee Management System

**UML** Unified Modelling Language

**WWW** World Wide Web

**JS** is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS

**CSV** stands for (Comma Separated Values) format is the most common import and export format for spreadsheets and databases

**URL** Uniform Resource Locator (URL), colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network

**GUI** Graphic User Interface

**HCI** is Human–computer interaction is research in the design and the use of computer technology, which focuses on the interfaces between people and computers

**FR** Functional Requirement

**NFR** Non-Functional Requirement

**AWS** Amazon Web Services

**EC2** Amazon Elastic Compute Cloud