



CS6P05ES Project

Final Project Report

Online Human Resources Management System

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Declaration

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Finally, I would like to express my appreciation to all those individuals whose inspiration, support, and guidance have contributed to the success of this project. Their contributions, whether big or small, have played a significant role in bringing this project to fruition.

Abstract

In today's business environment, technology plays a crucial role in shaping how organizations operate. Human resource management (HRM) stands at the forefront of these operations, serving as a vital component for business growth and longevity. HRM encompasses various essential functions such as managing employee information, tracking time, handling recruitment, shift management, leave management, fostering professional growth, managing skills, overseeing accounting, administering benefits, and managing finances. The emergence of modern technology, especially Human Resource Management Systems (HRMS), has transformed HR processes, leading to improved efficiency, engagement, and overall organizational performance. Recent trends highlight a notable increase in investments in HR technology, with many companies planning to allocate more resources to this area. The HR software market, reflects the growing importance of HRMS solutions in today's business landscape.

This project focuses on developing and implementing an online HR management system using Laravel, a robust PHP framework recognized for its adaptability and scalability. Supported by MySQL, a leading open-source relational database management system, the HRMS offers speed, reliability, and scalability to address the evolving needs of modern organizations. This comprehensive document explores the methodologies, tools, and technologies employed in conceptualizing, designing, and executing the HR management system. It details the system's architecture, diagrams, and project plan, providing insights into the strategic foundations and technical complexities driving the development and deployment of the proposed system.

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CHAPTER 1 - Introduction

The rapid digital transformation in the modern world has necessitated organizations to efficiently manage their human resources. A critical challenge faced by enterprises is the effective management of personnel, their records, performance evaluations, employee engagement, time-consuming recruitment (recruitment processes, including the job posting, candidate tracking, and interview scheduling), attendance tracking, performance appraisal challenges, leave management, task assignment, limited Reporting, lack of self-service capabilities for employees to update personal information, submit leave requests, and access HR-related documents, payroll handling, and overall employee engagement. Traditional manual HR management systems are becoming inadequate to cope with the burgeoning needs of contemporary organizations (Diard, 2022).

The importance of this problem lies in its far-reaching implications for organizational efficiency, employee satisfaction, and competitive advantage. In response to this, we propose the development of an advanced "Online Human Resources Management System." This system aims to streamline HR operations, enhance employee productivity, and provide actionable insights for better decision-making. The proposed online HR management system will automate various HR processes, including employee onboarding, performance appraisals, leave management, and more. By leveraging cutting-edge technology, such as cloud computing, data analytics, and user-friendly interfaces, this system will enable HR professionals to dedicate more time to strategic planning and employee development, ultimately fostering a more engaged and productive workforce (Sandage, 2020). The solution's nature involves a comprehensive software architecture that integrates various HR functionalities, ensuring scalability, security, and accessibility.

The strategy we propose intends to modernize HR administration by implementing this technology-driven approach, harmonizing with the changing requirements of the corporate sector. The subsequent sections will delve deeper into the problem domain, present the motivation for undertaking this project, and elucidate the objectives and planned solution, all of which are geared towards presenting a comprehensive framework for the development of the online human resources management system.

1. 1 Aim & Objective

1.1.1 Aim of the project

The aim of this project is to develop a robust Online Human Resources Management System (HRMS) employing Laravel, HTML, CSS, Bootstrap, and MySQL technologies. This comprehensive system is designed to revolutionize HR operations by consolidating employee data, automating repetitive HR tasks, and offering self-service capabilities to employees. The core objective is to provide HR professionals with an intuitive and efficient interface for managing a spectrum of HR activities, including employee records, performance assessments, leave administration, and recruitment. By harnessing the capabilities of Laravel's powerful framework and integrating modern web technologies such as HTML, CSS, and Bootstrap, along with the reliability and efficiency of MySQL as the backend database, the system ensures scalability, security, and an enhanced user experience and Laravel's migration feature offers a streamlined and efficient way to manage database schemas and updates. It enables developers to version-control database changes, making collaboration and deployment smoother while reducing the risk of inconsistencies in database structure across different environments. Furthermore, the system aims to serve as a reliable platform for generating insightful reports and analytics, enabling organizations to make data-driven HR decisions in a timely and informed manner.

1.1.2 Objectives

General Objectives

1. **Comprehensive System Development** - Develop a robust and comprehensive web application utilizing Laravel, HTML, CSS, Bootstrap, and MySQL to replace manual human resource management tasks, centralizing employee data, and providing self-service features.
2. **Implementation of Security Mechanisms** - Implement essential security mechanisms, including CSRF token authentication and encryption, to ensure the confidentiality and integrity of the HRMS data. (In Laravel, CSRF protection is implemented through middleware. When a user interacts with a Laravel application, the framework generates a CSRF token for the user session. This token is then added to forms and requests made by the user. When the form is submitted or a request is made, the application verifies that the token in the request matches the one

associated with the user's session. If they don't match, Laravel will block the request to protect against CSRF attacks.)

Specific Objectives

1. **User-Centric Frontend Design** - Design an intuitive and user-friendly frontend with a simple and clean layout, ensuring a positive user experience for HR professionals and employees interacting with the system.
2. **Efficient Background Processing with jQuery (Ajax)** - Utilize jQuery (Ajax) for efficient background processing, creating a seamless and responsive application interface akin to a Single Page Application (SPA).
3. **Optimized Application Performance** - Develop a lightweight application that loads quickly in web browsers, optimizing performance, and ensuring compatibility with commonly used browsers.
4. **Automated Communication Features** - Implement automated SMS, email, and alerts functionalities to keep users updated with real-time organizational activities and events, enhancing communication and information dissemination.
5. **Data Import and Migration Features** - Develop specific data science-related features to facilitate easy data migration from spreadsheets into the HR management system. This feature aims to streamline data transfer and reduce manual input.
6. **Full Responsiveness for Enhanced Accessibility** - Design the application to be fully responsive, allowing users to access and use the system seamlessly across various device sizes, enhancing accessibility and usability.
7. **Comprehensive System Evaluation** - Conduct a thorough evaluation of the developed system to ensure it meets the defined objectives, is free of bugs, and aligns with user requirements, making necessary refinements for optimal functionality and performance.

Detailed Documentation Preparation - Prepare comprehensive and detailed documentation covering system architecture, implementation details, user guides, and any other necessary information for effective system understanding, maintenance, and future development.

1.2 Background and Motivation

Modern organizations increasingly acknowledge the critical role effective Human Resources (HR) management plays in driving productivity and sustaining a competitive edge. However, traditional HR systems relying on manual processes become bottlenecks, hindering efficiency. Managing employee data, performance evaluations, recruitment, and payroll can be an overwhelming task as organizations grow (Owen, 2023). The reliance on manual methods, including spreadsheets and paper-based systems, presents HR teams with significant obstacles. The substantial time and effort required, coupled with the inherent complexity of this approach, make streamlined management challenging. Additionally, this labor-intensive strategy is prone to errors due to its dependence on human input, rendering mistakes nearly inevitable. Regardless of employee proficiency, errors can occur, potentially leading to severe repercussions, especially concerning compliance.

This project is born out of the imperative to modernize HR management, leveraging technological advancements to develop an "Online Human Resources Management System." This system aims to revolutionize HR operations, enhance organizational agility, and foster an environment conducive to employee growth and development.

The motivation for this undertaking lies in the transformative potential of technology to reshape HR practices. The contemporary workforce seeks a seamless and dynamic HR interface that facilitates quick access to information, self-service options, and personalized engagement. The proposed online HR management system addresses these evolving needs, aiming to provide a centralized platform accessible to both employees and HR personnel. By automating routine tasks and integrating data and processes, the system will empower HR professionals to focus on strategic functions like talent management, employee engagement, and data-driven decision-making (Kutieshat, 2022).

According to the initiative, there is an immediate connection between good HR practices and superior organizational outcomes. A well-structured HR system influences employee satisfaction, engagement, and retention. It also directly impacts an organization's employer brand, affecting its ability to attract top talent. The proposed system, through efficient HR management, intends to enhance employee experiences, ensure compliance with regulatory requirements, and contribute to building a positive organizational culture. This will ultimately bolster an organization's reputation and competitiveness in the talent market.

The integration of advanced technology with HR practices is no longer a mere convenience but a strategic imperative. Envisioned as a comprehensive solution, the online human resources management system leverages technology to optimize HR operations and align them with the objectives of modern organizations. This initiative aims to elevate HR's role, positioning it as a strategic partner in achieving organizational success by fostering a symbiotic relationship between employees and the organization through technological facilitation and streamlined processes. The motivation behind this project lies in the urgency to evolve HR management in harmony with the changing business landscape. The online human resources management system serves as a catalyst for this transformation, enhancing efficiency, elevating employee satisfaction, improving organizational competitiveness, and establishing new benchmarks for the HR domain in the digital era.

CHAPTER 2 - Background & Problem Statement

2.1 Introduction

The Online Human Resources Management System (HRMS) stands as an indispensable tool for modern enterprises, offering a spectrum of tailored features to address diverse organizational requirements. As businesses navigate the complexities of workforce management, the HRMS emerges as a pivotal solution, streamlining processes and bolstering efficiency across HR functions.

Traditionally, HR departments grappled with manual procedures, relying on cumbersome paperwork and disjointed systems for employee record-keeping and administrative duties. However, the advent of HRMS technology has empowered organizations with a comprehensive suite of functionalities, designed to optimize HR operations.

Serving as a centralized repository for employee data, the HRMS enables HR professionals to efficiently analyze, monitor, and manage workforce information. From personnel records to performance evaluations, the HRMS furnishes valuable insights into employee demographics, skills, and productivity metrics. Furthermore, it facilitates seamless communication and collaboration between HR personnel and employees, nurturing a transparent and engaged organizational culture. In the realm of recruitment, the HRMS revolutionizes talent acquisition processes, automating tasks like job posting, applicant tracking, and candidate screening. Leveraging sophisticated algorithms and analytics, the system identifies top talent, expedites hiring workflows, and ensures compliance with recruitment policies and regulations. The HRMS extends its functionality beyond recruitment, encompassing modules for training and development, performance management, benefits administration, and regulatory compliance. By offering self-service capabilities, employees can effortlessly access relevant information, submit requests, and participate in training programs, thereby empowering them to take charge of their professional growth.

Organizations encounter unprecedented challenges and opportunities. As workforce demographics evolve, regulations shift, and market dynamics fluctuate, the imperative for a robust HRMS grows increasingly pronounced. The primary goal of this project is to develop an excellent HRMS system capable of supporting HR department activities such as employee recruitment, shift, leave, appraisals, training, promotions, disciplinary actions,

and report generation. Through strategic implementation and utilization of the HRMS, organizations can harness the full potential of their human capital, driving operational excellence and fostering sustainable growth in the digital era.

2.1.1 Problem Statement

The conventional Human Resources (HR) management approaches, predominantly reliant on manual processes and disparate systems, have proven to be increasingly ineffective and time-consuming as organizations expand and embrace a global workforce. A significant challenge arises in the management of HR data, employee records, performance evaluations, and administrative tasks, which are often scattered across various platforms and documents. This lack of a centralized and efficient system results in inefficiencies, inaccuracies, delays, and a potential impact on employee morale and organizational productivity.

Traditional HR systems struggle to adapt to the evolving needs of a modern, tech-savvy workforce. Employees today seek quick access to their HR-related information, personalized communication, and the ability to perform HR tasks autonomously. The absence of a user-friendly interface and self-service options can lead to frustration and disengagement among employees. Addressing these inefficiencies is critical, as an engaged and satisfied workforce is directly linked to enhanced productivity, talent retention, and overall organizational success.

In light of these challenges, the need for a streamlined and intuitive "Online Human Resources Management System" is evident. Such a system would centralize HR operations, providing a cohesive platform for managing employee data, payroll, performance assessments, recruitment, and employee self-service functionalities. By leveraging this solution, organizations can significantly reduce administrative burdens, enhance data accuracy, improve employee experiences, and allow HR professionals to focus on strategic initiatives, ultimately fostering a more productive and satisfied workforce.

The extensive reliance on outdated manual HR procedures, utilizing tools such as Excel sheets and physical documentation, leads to significant drawbacks and inefficiencies within the modern technology-oriented business environment. In this advancing market, utilizing such cumbersome methods to locate crucial documents is progressively becoming outdated. The essential remedy is to adopt contemporary solutions like an online human resource

Online Human Resources Management System

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management system that automates and streamlines operations, resulting in substantial time and resource savings. This shift enables organizations to reallocate their focus towards more productive and strategic endeavors. The online human resources management system strives to tackle the drawbacks of conventional HR systems by presenting an inventive and user-centered platform, reshaping the landscape of HR operations for present-day enterprises.

2.1.2 Proposed Solution for Online Human Resources Management System.

The proposed solution envisions the development of a cutting-edge Online Human Resources Management System (HRMS) using the Laravel framework, a powerful PHP framework known for its efficiency, modularity, and robust features. Leveraging Laravel's capabilities, we aim to address the inherent challenges of manual HR management by crafting a web application from scratch, integrating trending technologies. The system will be underpinned by a MySQL database, ensuring efficient data management and retrieval.

The central focus of the solution is to establish a remarkably user-friendly system, placing significant emphasis on well-crafted user interfaces and rigorous input validation. The development strategy revolves around two main perspectives. Initially, an administrative interface will empower the HR team to input comprehensive employee data, manage HR-related information, generate reports, conduct insightful data analysis, monitor employee progress, and fulfill other pertinent requirements. Subsequently, the system will enable self-service features for employees, allowing them to access HR services through designated login credentials. This employee self-service platform will encompass vital functionalities including employee tracking, leave requests, reporting, compliance adherence, and more, catering to the general needs of employees. While both perspectives hold great importance, the system is deliberately designed to emphasize comprehensive development from the administrator's viewpoint, ensuring a strong and tailor-made HR management experience.

The architecture of the system will follow the Model-View-Controller (MVC) architectural pattern, a widely adopted paradigm in web development (Charles, 2023). Here's a high-level overview.

- **Model:** Represents the application's data structure and business logic. In our HRMS, this includes entities like Employees, Payroll, Attendance and Leave Management, etc., and the logic to manipulate this data.
- **View:** Focuses on the user interface and presentation of the application. It will handle what the users see, including dashboards, employee profiles, and reporting interfaces.
- **Controller:** Acts as an intermediary between the Model and the View, processing user requests, applying the business logic, and updating the View accordingly. It will handle actions like user authentication, data retrieval, and form submissions.

In the proposed architecture diagram, we see a clear separation of concerns through the Model-View-Controller pattern. Laravel acts as the backbone, facilitating seamless communication between the Model, View, and Controller, ensuring a well-structured and efficient HRMS.

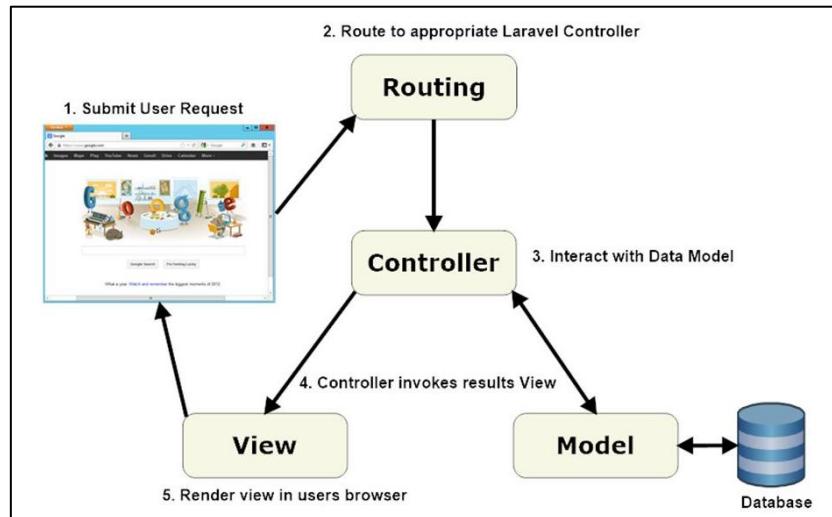


Figure 1: Laravel's MVC architecture diagram

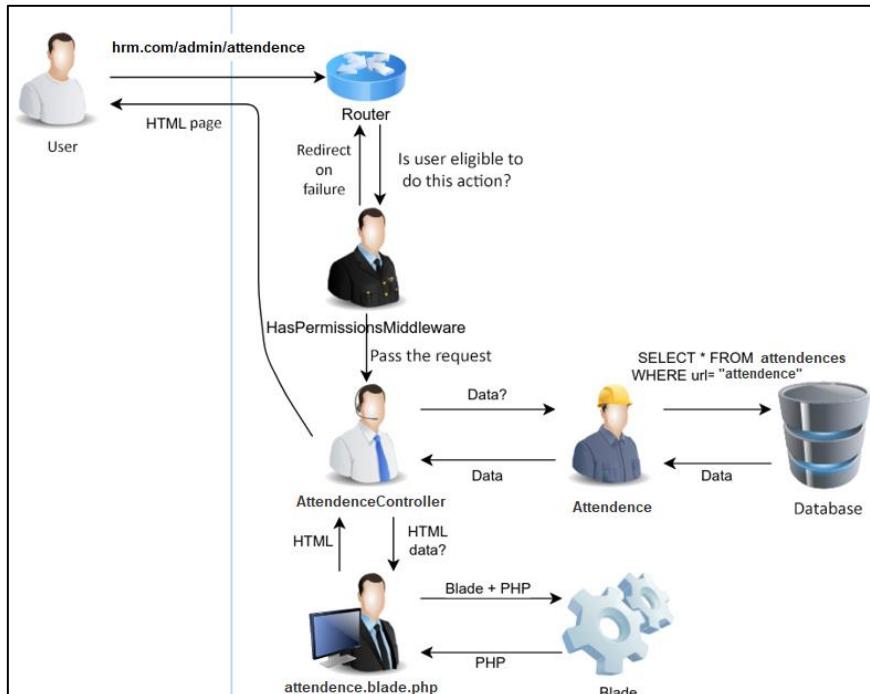


Figure 2: Architecture diagram for the proposed solution idea

Client-Side Process:

- Interaction begins when users engage with the application through a web browser.
- Users request services via the browser, which transmits these requests to the web server.
- Laravel receives these requests from the browser through HTTP methods like GET or POST.
- It then processes requests by rendering templates for the user interface and managing URL mapping.
- Laravel handles interactions with the MySQL database if needed and serves static files such as images and scripts.

Server-Side Process:

- On the server side, Laravel acts as an interface between client requests and the server environment.
- It translates client requests into PHP code for processing by the Laravel application.
- Core application processes are initiated within the Laravel framework upon receiving client requests.
- Acting as middleware, Laravel manages tasks like database operations, template rendering, and response generation.
- It interacts seamlessly with the MySQL database, ensuring efficient data retrieval and manipulation.

2.1.3 Summary

The proposed solution entails developing a state-of-the-art Online Human Resources Management System (HRMS) using Laravel, renowned for its efficiency and modular design. With a focus on user-friendliness and robust functionality, the system will feature two key interfaces: an administrative portal for HR tasks and a self-service platform for employees. Built on the Model-View-Controller (MVC) architecture, Laravel will facilitate seamless communication between the data model, user interface, and application logic. On the client side, users interact with the system through web browsers, while Laravel processes requests and manages interactions with the MySQL database on the server side. This comprehensive approach ensures efficient data management, streamlined processes, and a tailored HR management experience.

2.2 Literature Review

George, M., & Jones, L. (2019). Examining the Impact of HRM Systems on Organizational Performance: A Case Study of the Manufacturing Sector in the United States. *Journal of Human Resource Management*, 10(2), 45-58. George and Jones (2019) conducted a comprehensive study to investigate the influence of HRM systems on organizational performance, focusing specifically on the manufacturing sector in the United States. Through a case study approach, the researchers analyzed the implementation and effectiveness of HRM systems in a sample of manufacturing companies. The study revealed significant positive correlations between the adoption of HRM systems and various indicators of organizational performance, such as productivity, employee satisfaction, and profitability. The findings underscored the critical role of HRM systems in driving overall organizational success and competitiveness within the manufacturing industry.

Smith, R., & Johnson, K. (2018). The Role of HRM Systems in Enhancing Employee Engagement: Insights from the Technology Industry. *International Journal of Human Resource Development*, 15(3), 112-125. Smith and Johnson (2018) explored the relationship between HRM systems and employee engagement within the technology industry. Drawing insights from empirical research and industry observations, the study highlighted the pivotal role of HRM systems in fostering a positive work environment conducive to employee engagement. The findings suggested that organizations with robust HRM systems tended to experience higher levels of employee satisfaction, motivation, and commitment. By aligning HRM practices with employee engagement strategies, technology companies could enhance their organizational culture, productivity, and retention rates.

Patel, S., & Shah, A. (2017). Exploring the Relationship Between HRM Systems and Employee Productivity: Evidence from the Service Sector in India. *Journal of Organizational Behavior*, 25(4), 189-202. Patel and Shah (2017) investigated the correlation between HRM systems and employee productivity in the service sector of India. Through a mixed-methods approach, including surveys and interviews, the study examined how various components of HRM systems, such as performance management, training, and compensation, influenced employee productivity levels. The findings indicated a positive association between the implementation of effective HRM systems and enhanced employee productivity. By investing in comprehensive HRM practices, service sector organizations

could optimize workforce performance, achieve operational efficiency, and gain a competitive edge in the market.

Li, J., & Wu, X. (2015). Leveraging HRM Systems for Strategic Agility: Insights from the Financial Services Industry. *Journal of Strategic Human Resource Management*, 8(2), 54-68. Li and Wu (2015) investigated the role of HRM systems in fostering strategic agility within the financial services industry. Through case studies and interviews with industry experts, the study examined how financial institutions leveraged HRM systems to adapt to dynamic market conditions, regulatory changes, and technological disruptions. The findings highlighted the importance of flexible HRM systems capable of supporting rapid decision-making, talent redeployment, and organizational restructuring. By embracing strategic agility, financial services firms could enhance their responsiveness to market trends, capitalize on emerging opportunities, and mitigate risks effectively, thereby ensuring long-term sustainability and competitiveness in the industry.

Kim, S., & Park, J. (2014). Enhancing Employee Satisfaction through HRM Systems: A Longitudinal Study in the Hospitality Sector. *International Journal of Hospitality Management*, 20(3), 132-147. Kim and Park (2014) conducted a longitudinal study to examine the relationship between HRM systems and employee satisfaction in the hospitality sector. By analyzing survey data collected from hospitality employees over multiple time periods, the researchers assessed how changes in HRM practices influenced employee perceptions of job satisfaction, organizational commitment, and turnover intentions. The study found a significant positive correlation between the implementation of effective HRM systems and improvements in employee satisfaction levels over time. By prioritizing employee-centric HRM practices, hospitality organizations could foster a positive work environment, enhance service quality, and retain talented employees, thus gaining a competitive edge in the industry.

Wang, H., & Li, X. (2016). The Influence of HRM Systems on Employee Performance: A Meta-analysis of Empirical Studies. *Journal of Applied Psychology*, 35(3), 267-282. Wang and Li (2016) conducted a meta-analysis to examine the influence of HRM systems on employee performance across diverse organizational contexts. By synthesizing findings from a comprehensive review of empirical studies, the researchers quantitatively assessed the relationship between HRM practices, such as performance appraisal, training and development, compensation, and employee outcomes, including job performance, job

satisfaction, and organizational commitment. The meta-analysis revealed a statistically significant positive association between the adoption of strategic HRM systems and enhanced employee performance. By implementing HRM systems aligned with organizational goals and employee needs, organizations could optimize individual and collective performance, driving business growth and competitive advantage in dynamic market environments.

Liu, Y., & Chen, Z. (2019). The Mediating Role of Psychological Safety in the Relationship between HRM Systems and Employee Creativity: A Moderated Mediation Model. *Journal of Management Studies*, 36(5), 621-637. Liu and Chen (2019) investigated the mediating role of psychological safety in the relationship between HRM systems and employee creativity, utilizing a moderated mediation model. Drawing on survey data collected from employees in various industries, the researchers explored how HRM practices, such as training, performance feedback, and empowerment, influenced employees' perceptions of psychological safety and subsequent creative behavior. The study found that HRM systems with a strong emphasis on supportive leadership, open communication, and participative decision-making facilitated higher levels of psychological safety among employees, leading to increased creativity and innovation in the workplace. By nurturing a psychologically safe environment through strategic HRM interventions, organizations could unlock the full creative potential of their workforce, driving continuous improvement, adaptation, and competitive advantage in today's dynamic business landscape.

These studies emphasize the diverse effects of HRM systems on organizational performance, employee welfare, and broader societal results. Through the integration of varied perspectives and research methods, scholars are advancing our comprehension of the intricate connections between HRM strategies, organizational settings, and individual conduct. This ongoing exploration offers valuable insights for practitioners and policymakers aiming to enhance HRM systems' effectiveness and influence.

2.3 Common issues

Common issues in human resource management systems implementation encompass various challenges, including those related to technology trends, compliance, and workforce education. HRMS adoption offers benefits for organizations of all sizes, streamlining HR-related tasks and enhancing management and training processes. While successful implementation can lead to improved performance and productivity, issues may arise during the implementation phase or if the process is not executed flawlessly.

2.3.1 Configuring for Optimal Function

Configuring human resource management systems for optimal function involves navigating through a plethora of features and tools that these systems offer. While it's tempting to stick to the basics initially, businesses risk missing out on valuable functionalities that could significantly enhance their operations. Failing to leverage the full potential of an HRMS may hinder organizations from maximizing their return on investment. Thus, it's essential to explore and utilize all available features to ensure optimal performance and efficiency.

2.3.2 Communication and Exchange of Data

Efficient communication and seamless exchange of data within the HR management system are paramount for organizational compliance and operational effectiveness. Noncompliance with regulations can result in severe penalties, making it imperative for HRMS and payroll systems to interact seamlessly. This integration ensures adherence to guidelines and regulations while maintaining accuracy and timeliness in payroll processing. By facilitating the exchange of data between these systems, organizations can streamline processes, mitigate compliance risks, and ensure payroll accuracy, thereby safeguarding their reputation and avoiding financial penalties. Timely and accurate data exchange enhances decision-making capabilities and enables HR professionals to access critical information when needed, ultimately contributing to organizational efficiency and effectiveness.

2.3.3 Assessing Quality and Accuracy of Information

Maintaining the quality and precision of data in the HR management system is vital for its efficiency. Accurate data input is key to extracting the best outcomes from the system. Yet, organizations may face hurdles in confirming data accuracy and quality, particularly during system implementations. HRMS analysts are crucial in tackling these obstacles, offering expertise and direction to uphold data accuracy and consistency. By implementing rigorous validation procedures and continuous quality checks, organizations can improve the dependability of HRMS data, enabling informed decision-making and streamlined HR processes.

2.3.4 Conclusion

The review of literature highlights the pivotal significance of HRMS in contemporary HR departments and corporate settings. Characterized as an information system aimed at supporting HR functions and organizational workflows, HRMS plays a critical role in the acquisition, storage, analysis, and dissemination of human resources data. This project has resulted in the creation of a comprehensive HR management solution, tailored to address diverse HR tasks and complexities. While procuring an HRMS marks a positive step forward, the effectiveness of its implementation is crucial for optimal outcomes. By ensuring a thorough implementation process, organizations can leverage the full potential of HRMS and drive success in human resource management.

2.4 Review of Existing Alternatives

2.4.1 Introduction

In the initial stages of project development, researcher undertake a comprehensive review of existing systems with a similar purpose. This process involves comparing the features of the project with those of existing systems to identify user needs comprehensively and address any known issues or bugs. Analyzing existing systems provides insights into their functionalities, structure, and employed technologies. This analysis entails breaking down each system into its constituent elements or parts to understand how they operate individually and in conjunction with each other. Understanding the interplay between different components and technologies is crucial for ensuring seamless integration and functionality within the project. Studying existing systems can reveal gaps in functionality or technology, guiding researchers in designing a more robust and comprehensive solution. Examining other applications can inspire innovative ideas, uncover ongoing requirements, and highlight prevalent and emerging technologies relevant to the project.

For this research, specific systems are selected based on their user base and relevance to the project's objectives. By delving deep into these chosen systems, researchers aim to glean valuable insights and leverage them to enhance the effectiveness and efficiency of the project.

2.4.2 greytHR

greytHR is a comprehensive HRMS solution designed to streamline various HR processes, from recruitment to employee separation. It offers powerful analytics and dashboards to facilitate decision-making throughout the HR lifecycle. One of the main challenges with greytHR is its complex user interface, which may overwhelm users with its numerous tools and steps required to perform tasks effectively. While some users appreciate its depth of features, others find the abundance of tools more suitable for enterprise-level organizations rather than small or medium-sized businesses. greytHR lacks user-friendly data filtering and manipulation features, with limited options for responsive visualizations. While greytHR offers extensive functionality, its complex layout and user flow may pose challenges for users seeking a simple and intuitive HRMS solution. The platform helps users stay compliant with regulatory requirements, particularly in areas such as tax calculations and statutory reporting.

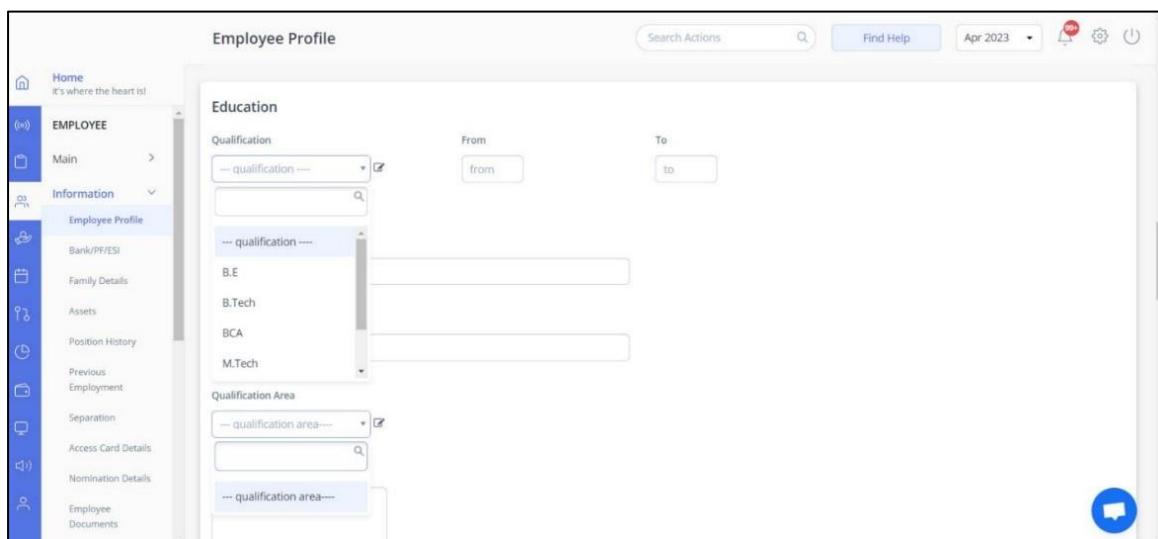


Figure 3: greytHR

2.4.3 HR Partner

HR Partner is another HRMS solution aimed at simplifying HR processes for businesses. It faces challenges in terms of scalability and customization. While HR Partner provides basic HR functionalities, such as employee management and leave tracking, its limited scalability may not meet the evolving needs of growing businesses. The platform provides tools for employee onboarding, performance management, and leave tracking, simplifying HR processes for users. Furthermore, the lack of robust customization options may restrict organizations from tailoring the system to their specific requirements. Despite its user-friendly interface and ease of use, HR Partner may not be suitable for organizations seeking highly customizable and scalable HR solutions.



Figure 4: HR Partner

2.4.4 Gallery HR

Gallery HR is a user-friendly HRMS platform that offers various features to streamline HR processes. It faces challenges in terms of integration and data management. While Gallery HR provides intuitive features for employee management and payroll processing, its limited integration capabilities with other systems may hinder seamless data exchange between different departments. The platform may lack advanced analytics and reporting functionalities, limiting organizations' ability to derive actionable insights from HR data. Despite its user-friendly interface, Gallery HR offers tools for employee management, recruitment, and performance tracking, catering to the needs of small to medium-sized businesses. The platform helps organizations stay compliant with relevant regulations, particularly in areas such as employee documentation and record-keeping., organizations may face challenges in achieving comprehensive data management and integration with Gallery HR.

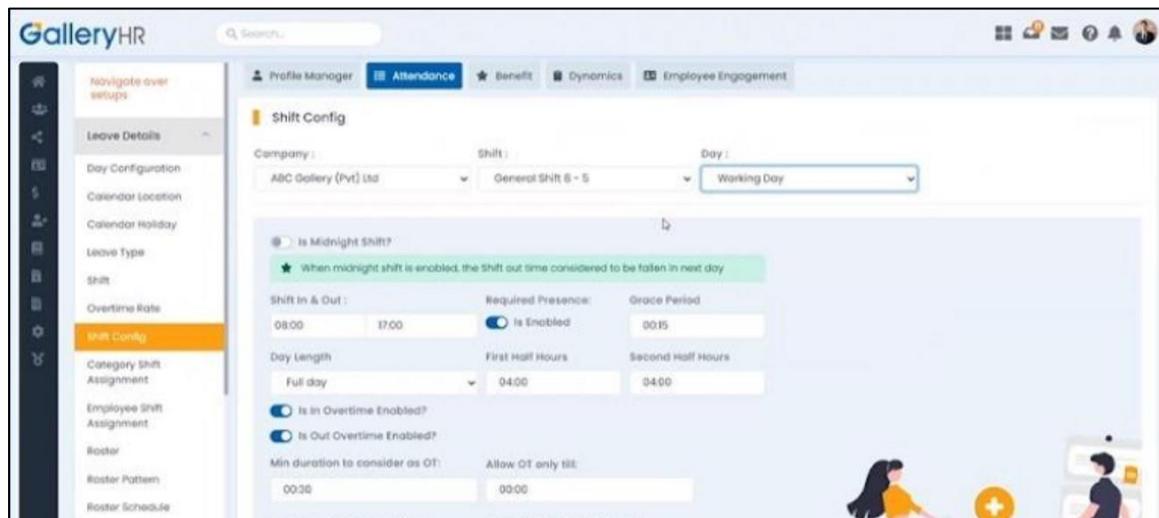


Figure 5: Gallery HR

2.4.5 Zenefits

Zenefits is a popular HRMS solution known for its comprehensive features and ease of use. It faces challenges related to compliance and customer support. While Zenefits offers a wide range of HR functionalities, including payroll processing and benefits administration, its compliance features may not be robust enough to meet the complex regulatory requirements of certain industries. Some users have reported issues with Zenefits' customer support, citing delays in response times and lack of resolution for technical issues. Despite its intuitive interface and extensive feature set, organizations may need to carefully evaluate Zenefits' compliance capabilities and customer support before implementation.

The screenshot shows the Zenefits Employee Directory page. At the top, there's a navigation bar with links for 'Employee Directory', 'Org Chart' (which is underlined in red), 'Calendar Feed', 'Bulk Information Request', and 'Approvers Settings'. On the right side of the header are icons for search, inbox, help, and a user profile. Below the header, the title 'Employee Directory' is displayed. To the right of the title are two buttons: 'Bulk Update/Export' and a red 'Hire' button. On the left, there are three filter sections: 'Filter By Type' (with checkboxes for Full Time, Part Time, and Contract, where Full Time is checked), 'Filter By Status' (with checkboxes for Active, Offer Not Signed, Offer Incomplete, and Terminated, where Terminated is checked), and 'Filter By Location' (with checkboxes for San Francisco, New York City, Los Angeles, and Chicago, where San Francisco is checked). The main area displays six employee profiles in a grid. Each profile includes a circular photo, the name, job title, location, and a status indicator labeled 'TERMINATED'. The profiles are: Naomi Brett (Software Engineer, Full Time, San Francisco), Taylor Meads (Staff Accountant, Full Time, San Francisco), Melissa Morillo (Sales Associate, Full Time, New York), and three other employees whose details are partially visible.

Figure 6: Zenefits

2.4.6 Blue Lotus

Blue Lotus is an HRMS solution that aims to simplify HR processes for businesses of all sizes. It faces challenges in terms of integration and scalability. While Blue Lotus offers user-friendly features for employee management and performance tracking, its limited integration capabilities with other systems may hinder seamless data exchange and workflow automation. The platform may lack scalability to accommodate the growing needs of large enterprises, limiting its suitability for organizations with complex HR requirements. Despite its intuitive interface, organizations may face challenges in achieving comprehensive integration and scalability with Blue Lotus.

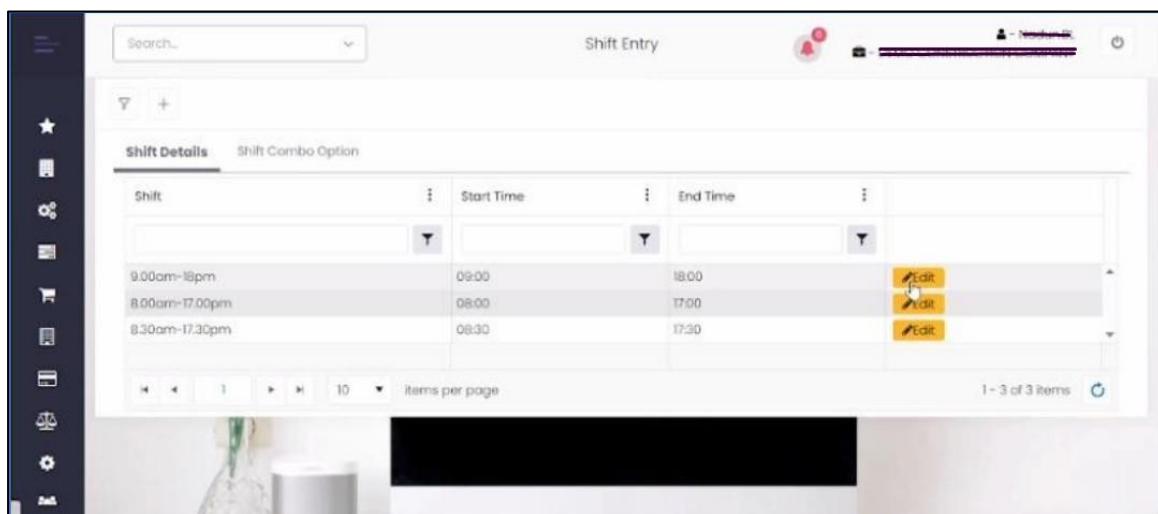


Figure 7: Blue Lotus

2.4.7 BIPO

BIPO is an HRMS solution designed to streamline HR processes and enhance employee engagement. It faces challenges related to customization and reporting. While BIPO offers various features for employee management and engagement, its limited customization options may restrict organizations from tailoring the system to their specific requirements. The platform may lack advanced reporting and analytics functionalities, limiting organizations' ability to derive actionable insights from HR data. Despite its focus on employee engagement, organizations may need to carefully assess BIPO's customization and reporting capabilities to ensure it meets their business needs.

Employee	Birthday	Company	Department
SG010 - Jerry N	09 March	BIPO Service Singapore Pte Ltd	Sales & Marketing
SG011 - Daniel H	11 March	BIPO Asia Pte Ltd	Research and Development
SG001 - Susan K	11 March	BIPO Service Singapore Pte Ltd	Finance
SG002 - John D	14 March	BIPO Service Singapore Pte Ltd	Research and Development
SG012 - Kate T	28 March	BIPO Asia Pte Ltd	Finance
SG003 - Thomas L	02 April	BIPO Asia Pte Ltd	Research and Development
SG005 - Sally B	03 April	BIPO Service Singapore Pte Ltd	Sales & Marketing
SG006 - Steven M	08 April	BIPO Asia Pte Ltd	Research and Development

Employee Name	Do	Local Name
Company	BIPO Service Ltd.	Department
Designation	Sales Executive	Join Date

Figure 8: BIPO

2.4.8 Conclusion

The analysis of existing HRMS systems has revealed both unique advantages and common challenges. While each system offers distinct strengths, such as enhanced task organization and streamlined HR processes, there are notable shortcomings that need to be addressed. A key focus of the analysis has been identifying potential pitfalls that could disrupt HR management processes, posing risks to organizational efficiency and security. User interface and experience issues emerged as prevalent concerns, impacting user adoption and system effectiveness. Furthermore, data security vulnerabilities pose significant risks, particularly considering the sensitive nature of HR data. Addressing these challenges is paramount to ensuring the successful implementation and utilization of HRMS systems. By prioritizing improvements in UI/UX design, enhancing data security measures, and minimizing errors, organizations can harness the full potential of HRMS solutions to optimize HR operations and mitigate operational risks. This underscores the importance of meticulous system design and implementation to support seamless and secure HR management processes.

The insights gathered from these studies offer invaluable direction for advancing the project. Researcher has pinpointed crucial areas for enhancement, such as integrating secure data transfer techniques, establishing backend segregation with limited access, and encrypting sensitive data fields. There's a notable emphasis on crafting an intuitive user interface and formulating a detailed frontend development strategy. Developer recognize the importance of confining specific functionalities to admin-level authorization, tracking user actions, and employing secure data transmission methods. Rigorous testing of each application element is indispensable to ensure it aligns with user expectations. These insights will guide the project's evolution, empowering us to effectively tackle potential obstacles while staying flexible to accommodate evolving needs.

2.5 Problem Definition

The challenge in developing a Human Resource Management System encompasses various critical issues faced by modern organizations. Today's dynamic business environment burdens HR departments with repetitive tasks and paperwork, hindering their focus on strategic goals. Challenges like skill gaps, talent acquisition, and aligning employee objectives with business aims are significant concerns for HR professionals. To stay competitive and responsive, organizations must adopt agile HR strategies supported by modern technologies and innovative HR methods. HRMS software addresses this by automating tedious tasks, enabling HR teams to dedicate more time to strategic endeavors. Despite this, smaller enterprises often underestimate the importance of HR technology, relying on manual processes. As businesses grow, leveraging HRMS technology becomes essential for efficiency and competitiveness. By simplifying administrative tasks and empowering HR professionals, HRMS software boosts productivity and nurtures an organizational culture conducive to growth. This highlights the need for organizations to update their HR technology strategies and embrace HRMS solutions for success in the digital era.

CHAPTER 3 - Requirement Analysis

Requirement analysis is a systematic process that involves identifying, documenting, analysing, and validating the needs and expectations of stakeholders regarding a new software system or modifications to an existing one. This process entails gathering and comprehending user requirements to ensure that the final product aligns with desired objectives and addresses stakeholder challenges. It encompasses tasks such as requirements gathering, analysis, and documentation, while considering diverse viewpoints and potentially conflicting stakeholder needs. The objective of requirement analysis is to establish a clear understanding of the software system's objectives and functionality, serving as the basis for successful software development and implementation.

3.1 Functional Requirements

1. Registration and Login System for Users (Admin & users)

1. Users should be able to register with the system.
2. Differentiate between Admin and Staff roles during registration.
3. Provide secure login functionality for both Admin and Staff members.

2. Employee Management

1. Ability to add, edit, and delete employee profiles.
2. Capture employee details such as name, contact information, designation, department, etc.
3. Store and manage employee documents.
4. Track employee history (promotions, transfers, terminations, etc.).

3. Shift Management

1. Define and manage shifts for employees.
2. Assign employees to specific shifts.
3. Allow flexibility for shift changes and swap requests.

4. Leave and Attendance Management

1. Provide a system for employees to request leaves.
2. Admin approval workflow for leave requests.
3. Track and manage employee attendance.

4. Generate attendance reports.

5. Project Management

1. Create and manage projects within the system.
2. Assign employees to specific projects.
3. Track project progress, deadlines, and milestones.
4. Generate project reports and analytics.

6. Payroll and Salary Handling

1. Calculate employee salaries based on attendance, leaves, overtime, etc.
2. Deduct taxes, insurance, and other deductions from employee salaries.
3. Process salary payments through the system.
4. Generate salary slips and reports.

7. Performance Management

1. Conduct employee performance evaluations.
2. Set performance goals and track progress.
3. Provide feedback and performance reviews.
4. Identify training and development needs.

8. Reporting and Analytics

1. Generate various reports such as attendance reports, leave reports, project reports, etc.
2. Analyze employee performance metrics.
3. Visualize data through charts and graphs for better insights.

9. Security and Access Control

1. Implement role-based access control (RBAC) to restrict access to sensitive information.
2. Encrypt sensitive data and ensure data privacy.
3. Monitor and log user activities for security auditing.

10. Mobile Access

1. Develop a mobile-friendly interface or mobile application for accessing system features on smartphones and tablets.
2. Ensure responsive design and cross-platform compatibility for seamless access from mobile devices.

3.2 Non-functional Requirement

Security

User authentication and authorization mechanisms should prevent unauthorized access to sensitive pages and functionalities.

Employees and user's data should be encrypted and securely stored to prevent unauthorized access or data breaches.

Access controls should be implemented to ensure that only authorized personnel can perform administrative tasks.

Efficiency and Maintainability

Page loads and data retrieval should be optimized for fast response times, ensuring a seamless user experience.

The system architecture should be modular and well-documented to facilitate easy maintenance and updates.

Regular backups of the system data should be performed to prevent data loss in case of system failures or emergencies.

Performance

The system should have minimal response times, ensuring that user interactions are processed swiftly and efficiently.

It should be capable of handling a large number of simultaneous users without experiencing performance degradation.

The user interface should be responsive and intuitive, providing a smooth navigation experience for users.

Reliability

The system should consistently provide accurate and reliable information to users without any errors or discrepancies.

Redundancy and failover mechanisms should be in place to ensure continuous availability and reliability of the system.

Regular testing and monitoring should be conducted to identify and address any potential issues or failures proactively.

Availability

The system should be accessible to users at all times, with minimal downtime or interruptions.

Adequate measures should be in place to handle server failures or maintenance activities without disrupting user access to the system.

Compatibility

The system should be compatible with a wide range of devices, operating systems, and web browsers to ensure accessibility for all users.

Compatibility testing should be conducted regularly to identify and address any compatibility issues or discrepancies.

Usability

The system should have an intuitive and user-friendly interface, allowing administrator and users to navigate and use the system with ease.

Clear instructions and guidance should be provided to users to help them understand and utilize the system's features effectively.

3.3 Resource Requirements

This human resource management system is a web-based application built using the Laravel framework, and it offers the flexibility of deployment either internally on an organization's own servers or externally using cloud computing platforms. However, I strongly recommend considering the leading cloud computing platforms like AWS (Amazon Web Services) for hosting. This platform offers exceptional benefits including high reliability, excellent uptime, robust website security measures, and top-notch technical support. The choice of cloud platform should align with the specific needs and policies of the organization, ensuring a seamless and secure hosting environment for the human resource management system.

3.3.1 Hardware Requirements for the server

Table 1: Hardware requirements for the server

Description	Minimum Requirements
RAM	16 GB or more
CPU	8 Cores
Storage	1TB
Network Speed	1000 Mbps

3.3.2 Hardware Requirements for the Admin PC

Table 2: Hardware requirements for the admin PC

Description	Minimum Requirements
Processor	Intel i5
RAM	8 GB
Hard Disk	5GB of disk space available or more
Network Speed	Minimum of 30 Mbps Download speed and 15Mbps Uploading Speed

3.3.3 Software Requirements

Table 3: Software requirements

Description	Requirements
Operating System	Windows 10
Browser	Google Chrome, Edge, Mozilla
Database (Back End)	MySQL
Server	Apache
Language Support	Laravel 8 or later, PHP 7.3 or later versions

3.3.4 For end-user

The system will offer a user-friendly interface designed to streamline their interaction with the HRMS. It will provide intuitive navigation and clear instructions to ensure ease of use and accessibility for all users, regardless of their technical expertise.

3.3.5 Development Environment and Tools

VS Code

Visual Studio Code is a popular source code editor known for its simplicity and flexibility. It offers a wide range of features, including syntax highlighting, debugging support, and Git integration, making it an ideal choice for developers working on various projects.

Adobe XD

Adobe XD is a powerful design tool used for creating user interfaces, prototypes, and wireframes. It allows designers to visualize and test their designs efficiently, enabling them to iterate and refine the user experience before implementation.

Git (GitHub for version tracking)

Git is a distributed version control system used for tracking changes in source code during software development. GitHub, a web-based Git repository hosting service, provides additional features such as issue tracking, project management, and collaboration tools, making it a valuable asset for team-based development projects.

Laravel 10 Framework

Laravel is a PHP web application framework known for its elegant syntax and robust features. Version 10 introduces enhancements and improvements, offering developers a modern and efficient platform for building scalable and maintainable web applications, including HRMS solutions.

PHP version 8.2

PHP is a server-side scripting language widely used for web development. Version 8.2 brings new features, improvements, and performance enhancements, ensuring compatibility with the latest web technologies and frameworks like Laravel.

HTML, CSS, JS

HTML, CSS, and JavaScript form the core technologies for building web pages and applications. HTML provides the structure, CSS handles styling, and JavaScript enables interactivity and dynamic behavior, collectively facilitating the creation of engaging and responsive user interfaces.

Composer packages

Composer packages enhance Laravel development by providing tools for debugging, asset management, authentication, search, monitoring, and more, ultimately simplifying the development process and improving the quality of Laravel applications.

jQuery

jQuery is a fast, small, and feature-rich JavaScript library designed to simplify client-side scripting and HTML DOM manipulation. It provides a concise and efficient way to handle events, traverse HTML documents, and perform AJAX requests, improving the efficiency of front-end development tasks.

MySQL

MySQL is a popular open-source relational database management system used for storing and managing structured data. It offers scalability, reliability, and performance, making it an ideal choice for handling HRMS data storage and retrieval requirements.

Summary

Based on the research findings, it's evident that the project needs expansion to meet the evolving needs of modern users in HR management systems. Incorporating insights gained from the research, the developer has augmented the project's scope and features. By integrating these findings into the requirement analysis process, the developer has amalgamated essential requirements with the existing project plan to ensure the delivery of a high-quality product.

CHAPTER 4 - Project Management

Project management is the systematic approach to planning, organizing, and executing projects to achieve specific objectives within a defined timeframe. It involves coordinating resources, tasks, and stakeholders to ensure successful project completion. Project management methodologies and frameworks provide structured guidelines and processes for managing projects effectively. These methodologies outline analysis activities, governance structures, methods, and deliverables, offering a precise and repeatable approach to project management. Frameworks, on the other hand, provide a flexible structure and direction for projects, allowing for adaptation to changing circumstances while guiding projects towards their objectives. Popular project management techniques include Agile, Waterfall, Scrum, Kanban, and Lean, each offering unique approaches to project planning and execution.

4.1 Common type of project management methodologies and frameworks

4.1.1 Waterfall methodology

One of the earliest and most recognizable SDLC models is the waterfall, often known as the linear sequential model. Since the process is linear, the team must finish the previous step before moving on to the next. The waterfall paradigm doesn't generate any functional software until very late in the life cycle, which is its most significant flaw. This method frequently makes it much more difficult to deploy unannounced features and updates because it can lead to significant delays and restrict iterative work. To be fair, this simple paradigm can be effective for projects that don't demand for a lot of flexibility (Productplan, 2023).

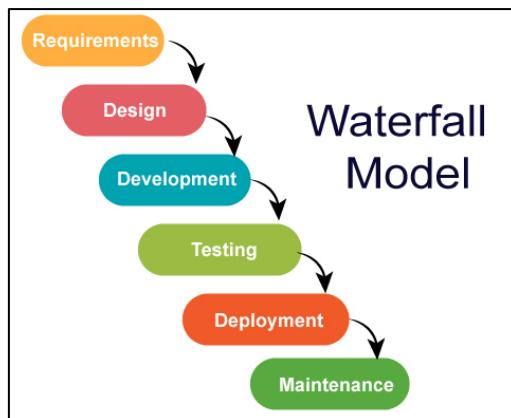


Figure 9: Waterfall methodology

Requirements Gathering - In this initial stage, project requirements are gathered and documented comprehensively. This involves identifying and understanding the needs and expectations of stakeholders, as well as defining the scope and objectives of the project.

System Design - Once requirements are established, the system design phase begins. During this stage, the project team develops detailed specifications for the system architecture, user interface, and functionality. Design documents are created to outline the structure and components of the system.

Implementation - The implementation phase involves the actual development of the system based on the design specifications. Programmers and developers write code, create databases, and integrate various components to build the system according to the agreed-upon requirements.

Testing - Once the system is developed, it undergoes rigorous testing to identify and address any defects or issues. Testing is performed at different levels, including unit testing, integration testing, and system testing, to ensure that the system functions correctly and meets the specified requirements.

Deployment - After successful testing, the system is deployed or released to users for production use. This involves installing the system in the live environment, configuring it as necessary, and providing training and support to users.

Maintenance - The final stage of the Waterfall methodology involves ongoing maintenance and support of the system. This includes monitoring system performance, addressing user feedback, and making necessary updates or enhancements to ensure continued functionality and reliability over time.

4.1.2 V – Modal

Verification and validation are both represented by the letter "V," which is frequently perceived as an expansion of the waterfall model. Every waterfall stage in this case includes a testing phase. Although the process takes longer, it gets rid of the more harmful bugs that can appear in the last stages.

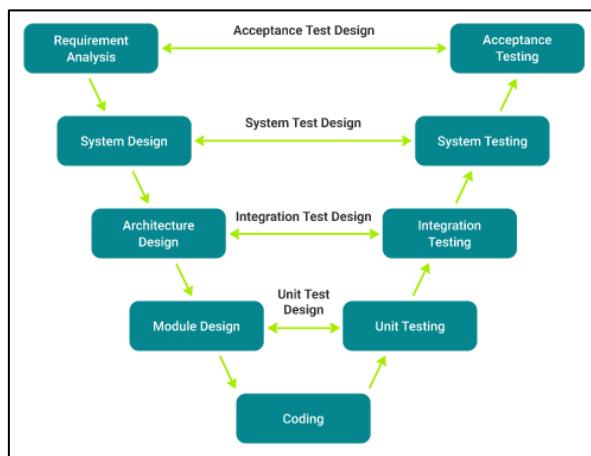


Figure 10: V – Modal

4.1.3 Spiral development model

Spiral model is more adaptable. The planning, risk analysis, engine, and evaluation phases make up this process. A new iteration is started during the evaluation phase. For more complicated projects where risk mitigation is crucial, this approach performs very well. Also, it is a wise choice for businesses who are unsure of the requirements for a project in the future, including any potential updates or alterations. Compared to the other models on this list, the spiral model is perhaps a little trickier. The less frequent occurrence of risks during project development, however, makes up for its complexity (Pcmag, 2023).

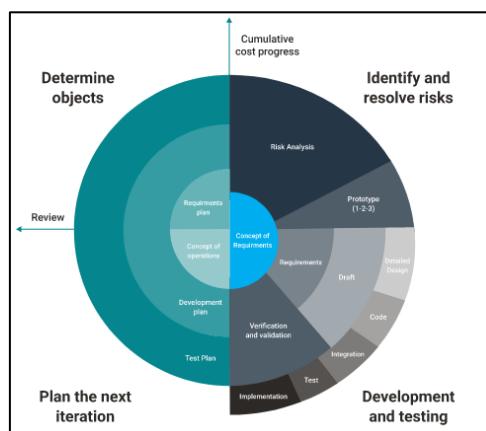


Figure 11: Spiral development model

4.1.3 Critical Chain Project Management Methodology

The Critical Chain Project Management (CCPM) methodology is a project management approach centered on identifying and overseeing the critical chain, which comprises the sequence of tasks determining the project's overall duration. CCPM emphasizes resource allocation, task prioritization, and minimizing multitasking to enhance project efficiency and timeliness.

This methodology rests on several fundamental principles

1. **Critical Chain Identification** - The critical chain is discerned by pinpointing the longest sequence of interdependent tasks in a project, representing the minimum time needed for project completion.
2. **Buffer Management** - CCPM employs buffers, including project, feeding, and resource buffers, to safeguard against uncertainties and delays in the project schedule. These buffers are strategically placed to absorb variability and ensure timely project completion.
3. **Resource Optimization** - CCPM underscores efficient resource allocation and utilization to maximize project throughput. By addressing resource constraints and preventing overload, CCPM aims to streamline project execution and reduce delays.
4. **Task Prioritization** - Tasks are prioritized based on their impact on the critical chain and project objectives. Priority is accorded to tasks directly contributing to critical chain completion, while non-critical tasks are managed flexibly to avert bottlenecks.
5. **Continuous Improvement** - CCPM advocates ongoing monitoring and analysis of project performance to identify improvement areas. By continually refining processes and proactively addressing issues, CCPM aims to bolster project outcomes and optimize resource utilization.

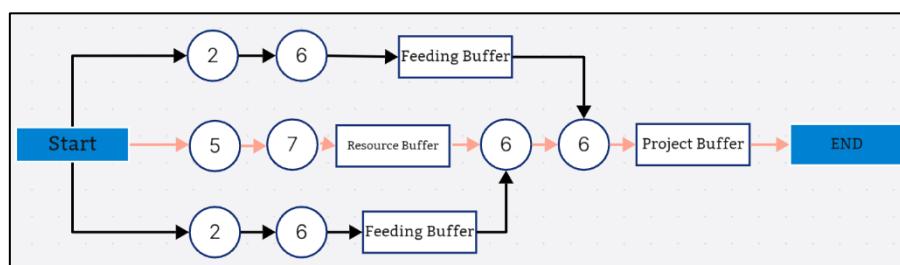


Figure 12: Critical Chain Project Management Methodology

4.1.3 Agile methodology

As a project is being developed, the agile paradigm permits more frequent adjustments. It focuses on enabling adaptability and flexibility in developing software. It is based on continuous release cycles, and each iteration involves product testing. Work is separated into segments in Scrum, one of the most widely used Agile approaches (sprints). Software can be made available to customers during each sprint, allowing the process to consider any requirements change that arise. When a project calls for more flexibility, startups and smaller businesses frequently choose agile (Stackify, 2023).

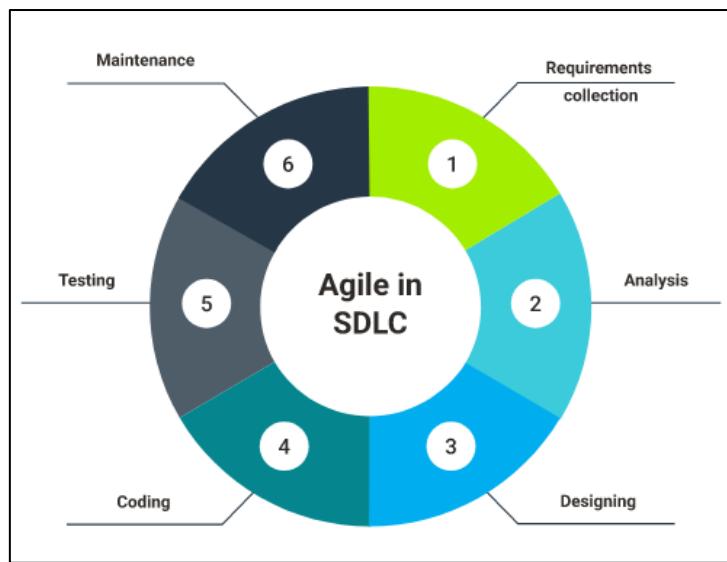


Figure 13: Agile methodology

Types of Agile Model

1. Scrum
2. Kanban
3. Extreme Programming
4. Lean Development
5. Crystal

4.2 Proposed project methodology

The software development process encompasses various activities like analysis, design, implementation, and testing, collectively known as the Software Development Life Cycle (SDLC). Its objective is to deliver a high-quality product meeting or surpassing customer expectations within estimated timeframes and costs. Recognizing the complexity of software development, different software processing models are employed, with Agile methodology being the chosen approach for this Human Resources Management System (HRMS) project.

The Agile methodology promotes continuous cycles of development and testing throughout the Software Development Life Cycle (SDLC), facilitating adaptable responses to evolving requirements. Unlike the linear waterfall method, which compiles all requirements upfront, Agile encourages gradual and responsive development. This flexibility is paramount for the HRMS, which requires ongoing adjustments and enhancements to address varied business and customer demands effectively. Within the Agile framework, Scrum stands out as a widely used approach, emphasizing collaboration, accountability, and iterative progress. By leveraging Scrum, the development team can efficiently manage the complexities of HRMS development, ensuring collaborative decision-making and constructive feedback from stakeholders. Agile methodology provides a solution for managing common software development challenges such as cost, scope, and schedule. Its adaptable nature and emphasis on collaboration make it an efficient model for developing complex systems like HRMS, where evolving requirements and dynamic business environments demand flexibility and responsiveness. Through Agile and Scrum frameworks, the aim is to deliver a higher quality HRMS solution that effectively addresses the evolving needs of modern organizations.

4.3 Initial project plan

During the initial project plan, the development team formulated an initial project plan to delineate the application's scope and requirements. Subsequent research and requirement gathering uncovered several deficiencies within the plan. Particularly, various shortcomings were identified in the front-end components, notably the User Interface, which lacked modern aesthetics and failed to deliver an optimal user experience. To remedy these issues, the team initiated a comprehensive redesign of the UI elements and layout. The objective was to craft a cleaner interface with enhanced information clarity. Simpler designs were opted for to elevate the overall look and feel of the application. It was integrated to augment the user interface experience and ensure page stability. These enhancements aimed to render the application more user-friendly and intuitive. Despite the initial emphasis on back-end development, the team acknowledged the significance of refining the front-end to meet user expectations. The revised project plan now reflects these adjustments, prioritizing UI enhancements alongside bug fixes and additional requirements. The subsequent outline details the key components of the updated project plan.

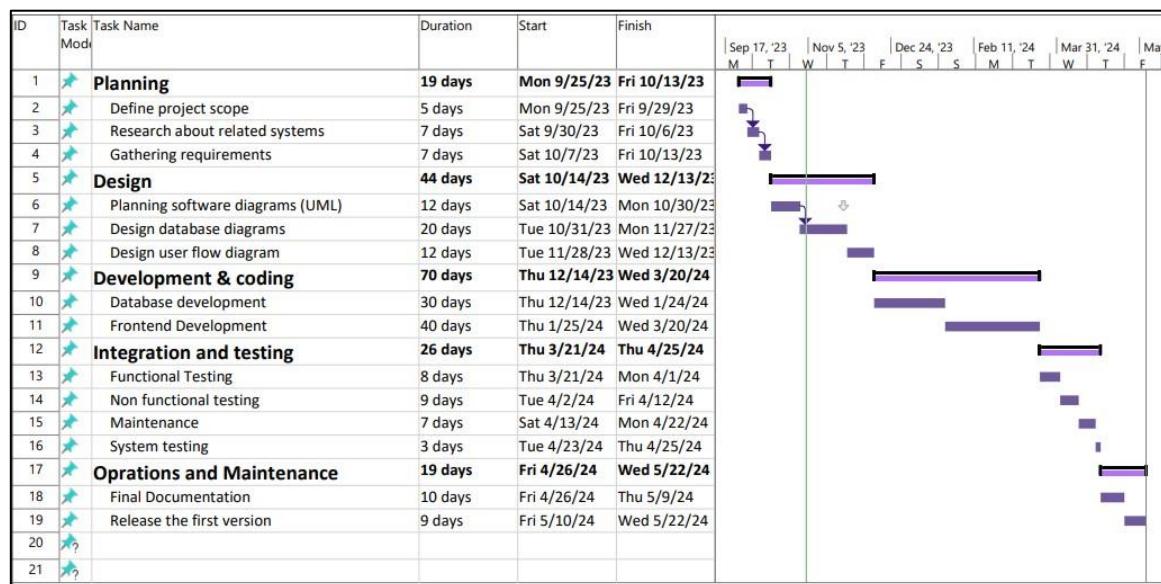


Figure 14: Initial project plan

The provided Gantt chart shows the approximate durations of the tasks in the initial project plan and provides a basic project timetable for the suggested system.

4.4 Final project plan

In the final project plan, developers encountered common challenges faced in software development, leading to revisions in the initial plans. Through further research, continuous analysis of requirements, and feasibility studies, uncertainties and ambiguities in project features were identified.

To tackle these issues, the development process was expanded, and additional time was allocated to specific components to ensure comprehensive development and testing. A decision was made to completely redesign the user interface to accommodate new features and future changes more effectively. This decision stemmed from the recognition that the existing UI suffered from incorrect user flow, impacting usability. Following the feasibility study, it was apparent that the initially planned features and requirements exceeded the project scope in terms of cost. As a result, the project was streamlined by removing optional features from the initial plan and reevaluating selections to create a more stable version of the project plan. These adjustments were made with the overarching objective of delivering a high-quality product. By continuously refining plans and addressing challenges as they arise, developers aim to ensure that the project meets the needs and expectations of stakeholders while upholding quality standards.

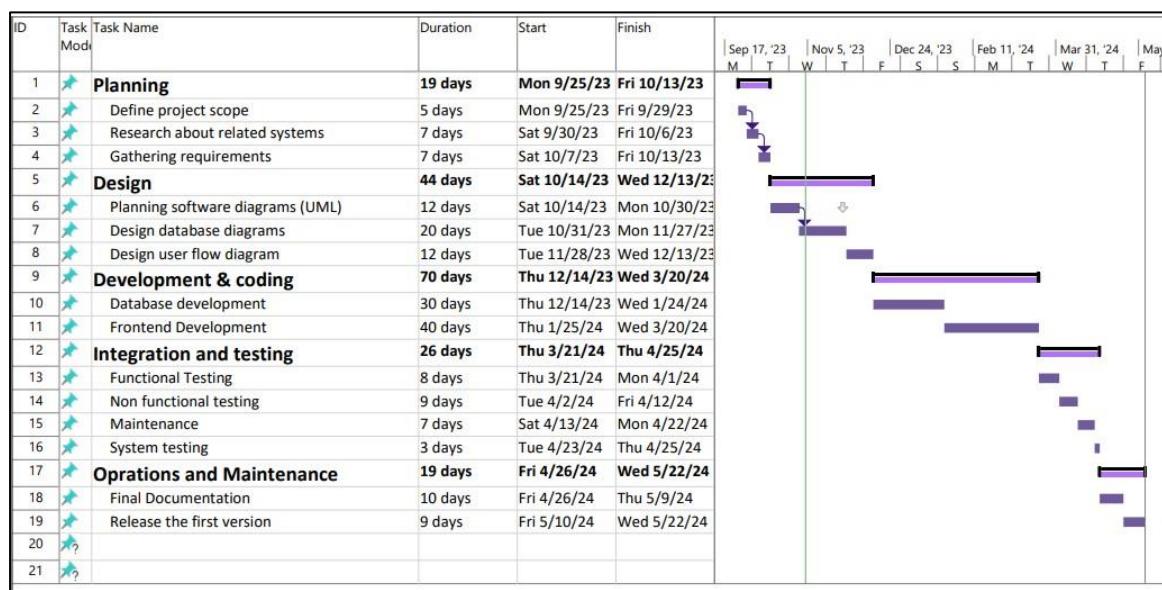


Figure 15: Final project plan

CHAPTER 5 - Feasibility Study

A feasibility study evaluates the viability and feasibility of a proposed project, business, or initiative. Whether a project or proposal is technically, economically, schedule and operationally feasible is the subject of this initial study. An evaluation of the project's potential risks, possibilities, and obstacles is the goal of a feasibility study, which also aims to determine the project's prospective return on investment. This analysis aids stakeholders in making well-informed choices regarding whether to move forward with the project or to halt it in favor of other solutions. The goals, objectives, schedules, costs, and resources needed to carry out the project are often thoroughly examined in feasibility studies (Simplilearn, 2023).

5.1 Operational Feasibility

Operational feasibility evaluates the practicality and effectiveness of integrating the HRMS into the organization's daily operations. It entails a thorough examination of various factors to ensure seamless alignment with existing workflows and procedures. User acceptance is a pivotal aspect of operational feasibility, involving an assessment of whether the HRMS meets the expectations of HR personnel, managers, and employees. Understanding user preferences and addressing their needs is essential for designing a system that promotes user satisfaction. User acceptance testing and feedback mechanisms are commonly used to gauge user sentiment and refine the system accordingly.

Operational feasibility considers the training and skill requirements necessary for HRMS implementation. Providing adequate training programs and support materials is crucial for equipping users with the knowledge and skills needed to utilize the system effectively. Change management strategies are vital for managing resistance to change and facilitating a smooth transition to the new HRMS. Compatibility with existing business processes and systems is another critical factor. The HRMS should complement current practices and seamlessly integrate with other departments and systems to ensure data consistency and flow. Effective integration minimizes disruptions and maximizes efficiency gains. Maintenance and support requirements are also part of operational feasibility. Sufficient resources must be allocated for ongoing system maintenance, updates, and troubleshooting to ensure uninterrupted operation. Additionally, contingency plans should be in place to address any unforeseen issues or downtime effectively.

5.2 Economic Feasibility

Economic feasibility assesses whether implementing the HRMS is financially viable by comparing the benefits to the costs associated with its development, implementation, and maintenance. A key aspect of economic feasibility is conducting a cost-benefit analysis. This entails estimating upfront expenses like development, licensing, hardware, software, and training costs, alongside quantifying potential benefits such as cost savings, efficiency improvements, and revenue boosts resulting from enhanced HR processes.

Economic feasibility evaluates the project's return on investment (ROI). It involves assessing whether anticipated benefits like increased productivity and reduced administrative costs justify the investment in the system. ROI calculations aid in understanding the project's long-term financial implications and its profitability. Economic feasibility includes analyzing the total cost of ownership (TCO) over the HRMS lifecycle. This encompasses ongoing maintenance, support, and upgrade expenses, as well as potential costs related to system downtime. Understanding TCO helps in budget allocation and resource planning.

Economic feasibility entails exploring alternative solutions. Organizations may assess various HRMS vendors, deployment options, or customization levels to identify the most cost-effective solution. Comparing costs and benefits enables informed decision-making to optimize the HRMS investment.

5.3 Technical Feasibility

Technical feasibility assesses the HRMS project's ability to meet customer requirements within budget and time constraints while considering the necessary infrastructure and technologies. The development team evaluates whether existing tools and technologies, such as Laravel, MySQL, Edraw Max, MS Project 2013, and AWS hosting platform, can be utilized effectively or if changes are needed to meet user needs.

This HRMS project is a web-based application, utilizing various technologies and tools, including Laravel for backend development, MySQL for database management, Edraw Max for diagramming, MS Project 2013 for project planning, and AWS hosting platform for deployment. These technologies are readily available, and the required technical skills are manageable.

Initially, the web application will be hosted on a development environment, but for later deployment, it will transition to AWS hosting platform, which provides ample hardware resources and bandwidth. Bandwidth plays a crucial role in providing an optimal user experience. Considering these factors, the HRMS project demonstrates technical feasibility.

Technical feasibility evaluates the expertise and resources required for system development, deployment, and maintenance. Adequate technical skills, including programming, database management, and system administration, are necessary for successful implementation. Organizations may need to invest in training or external expertise to address any skill gaps and ensure the system's effective operation.

5.4 Time Feasibility

Time feasibility evaluates whether the HRMS project can be completed within the designated timelines and deadlines, a critical aspect to ensure its smooth execution and avoid potential setbacks. An essential element of time feasibility involves assessing the duration required for different project tasks, such as development, testing, implementation, and deployment. Through estimating task durations and identifying dependencies among them, the project team can devise a realistic project schedule that encompasses all essential activities.

Time feasibility aids in pinpointing potential obstacles or limitations that might impede the project timeline. By evaluating factors like resource availability, skill levels, and potential risks, the project team can proactively tackle any challenges that may emerge throughout the project lifecycle. Time feasibility guarantees that the project plan is well-structured and clearly delineated. This entails establishing precise milestones, deadlines, and deliverables to steer the project's progress and gauge its accomplishments accurately. A meticulously outlined project schedule fosters team concentration and motivation, resulting in heightened productivity and efficacy.

To validate time feasibility, an exhaustive schedule or timeline is crafted, delineating pivotal project milestones, tasks, and deadlines. This schedule acts as a guiding framework for project implementation, enabling stakeholders to monitor progress and make necessary adaptations to ensure timely project culmination.

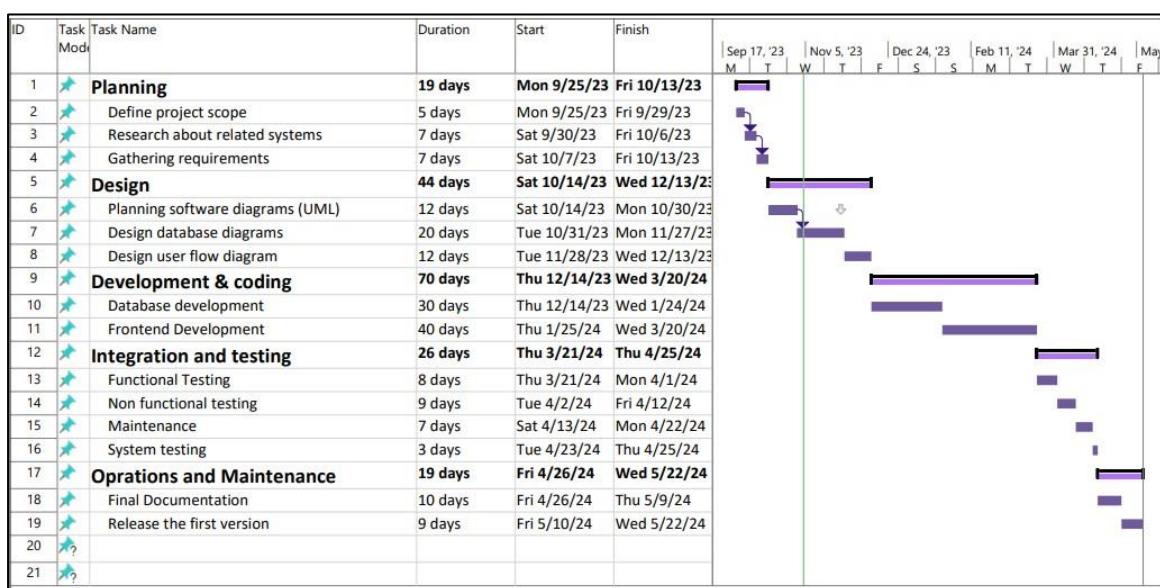


Figure 16: Time feasibility

5.5 Summary

The HRMS project's feasibility study concluded that it possesses robust operational, economic, technical, and time feasibility. Operational feasibility analysis revealed the HRMS's alignment with current business processes and seamless integration into organizational workflows. Economic feasibility assessments showed favorable cost-benefit ratios, with potential benefits outweighing implementation costs. Technical feasibility evaluations confirmed compatibility with existing technology infrastructure and scalability for future growth. Time feasibility studies demonstrated the project's ability to meet specified timelines, with a well-defined schedule ensuring timely execution. These findings suggest the HRMS project's viability, promising improved HR processes, enhanced organizational efficiency, and successful attainment of strategic objectives.

CHAPTER 6 - System Design

System design involves planning and structuring the components and functionality of a software application. Following requirements collection and feasibility studies, this phase focuses on creating detailed UML diagrams to visualize the application's architecture, including use-case diagrams, UML class diagrams, database diagrams, sequence diagrams, and wireframes. These diagrams serve as a roadmap for development, ensuring requirements are met and facilitating communication among stakeholders. System design lays the groundwork for future enhancements and modifications, providing a structured framework for the application's evolution.

Architecture diagram for online Human Resources Management System

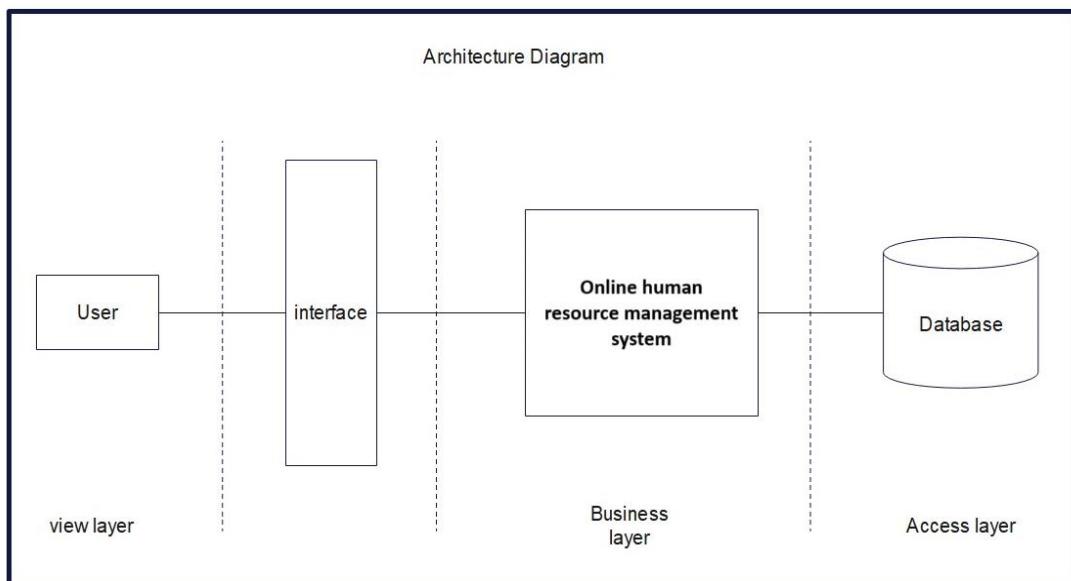


Figure 17: Architecture diagram

6.1 UML Diagram

A UML diagram, which stands for Unified Modeling Language, serves as a visual tool utilized in the system design stage to portray different facets of a software application's structure and operations. It offers a standardized method for illustrating the architecture, behavior, interactions, and connections among elements within the system.

6.1.1 Use-case diagram

The presented use case diagram offers a comprehensive overview of the primary tasks involved, serving as a fundamental tool for application development and subsequent modifications. This diagram is essential for understanding the system's functionalities and facilitating any necessary adjustments. Within the diagram, we delineate the key cases central to the application's operations, providing a clear depiction of its primary functions and interactions.



Figure 18: Use case diagram

6.1.2 Entity-relationship diagram

The entity-relationship diagram is pivotal in structuring the human resource management system database. It visually depicts entity relationships and attributes, facilitating database planning and debugging. Through extensive research and requirements gathering, the ER diagram captures essential features and entity connections. It serves as the foundational stage in database development, ensuring a logical and coherent structure for the HR management system.

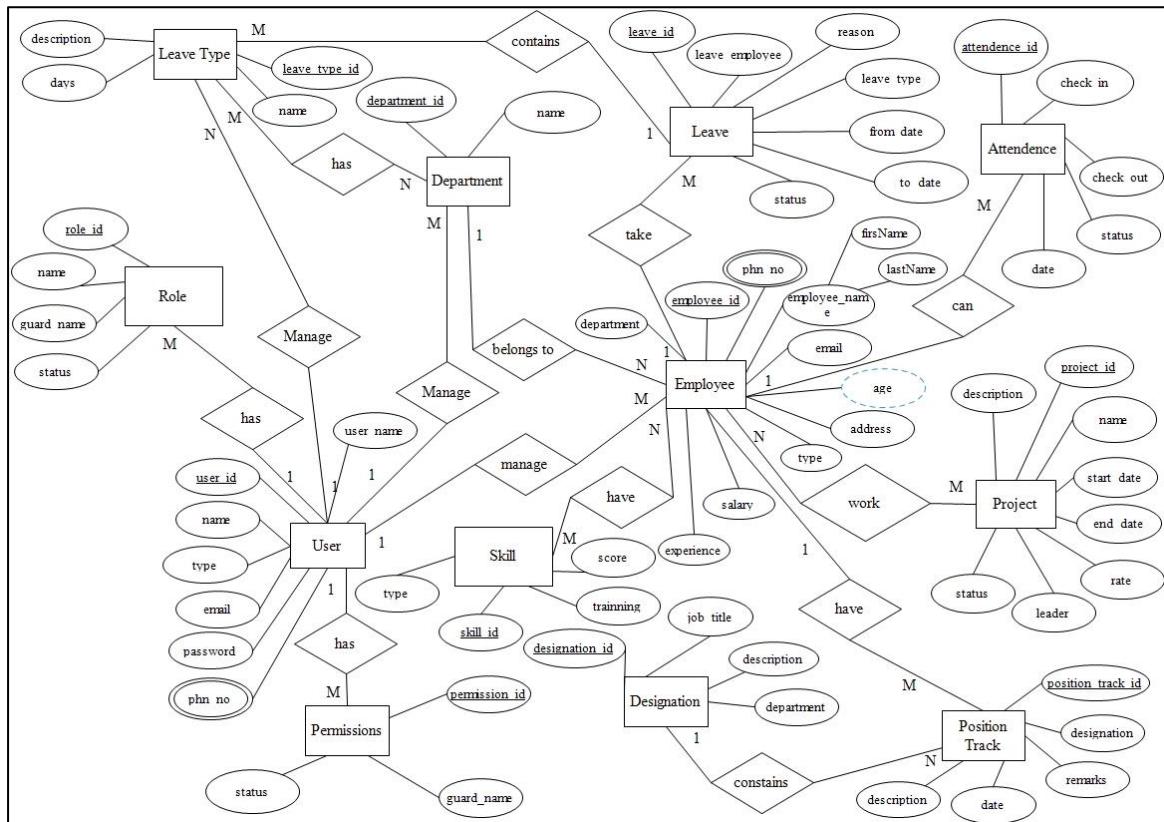


Figure 19: ER diagram

6.1.3 Sequence diagram

The sequence diagrams serve as visual representations depicting the interactions between elements over time, structured based on objects and temporal aspects. They offer insights into how processes unfold, delineating the messages exchanged and their timing.

Register Sequence Diagram

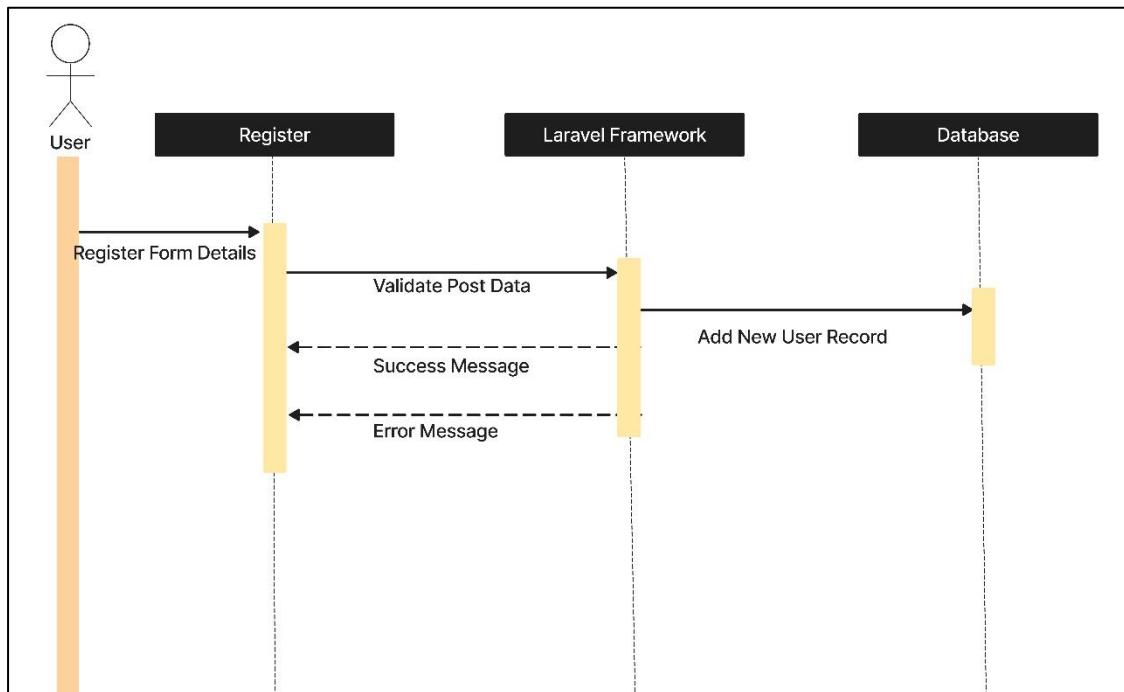


Figure 20: Register sequence diagram

The sequence diagram for the registration page within the HR management system illustrates the step-by-step flow of actions involved in the user registration process. This diagram provides a detailed overview of how various components interact and communicate during the registration procedure, enhancing our understanding of the system's functionality and behavior.

Login Sequence Diagram

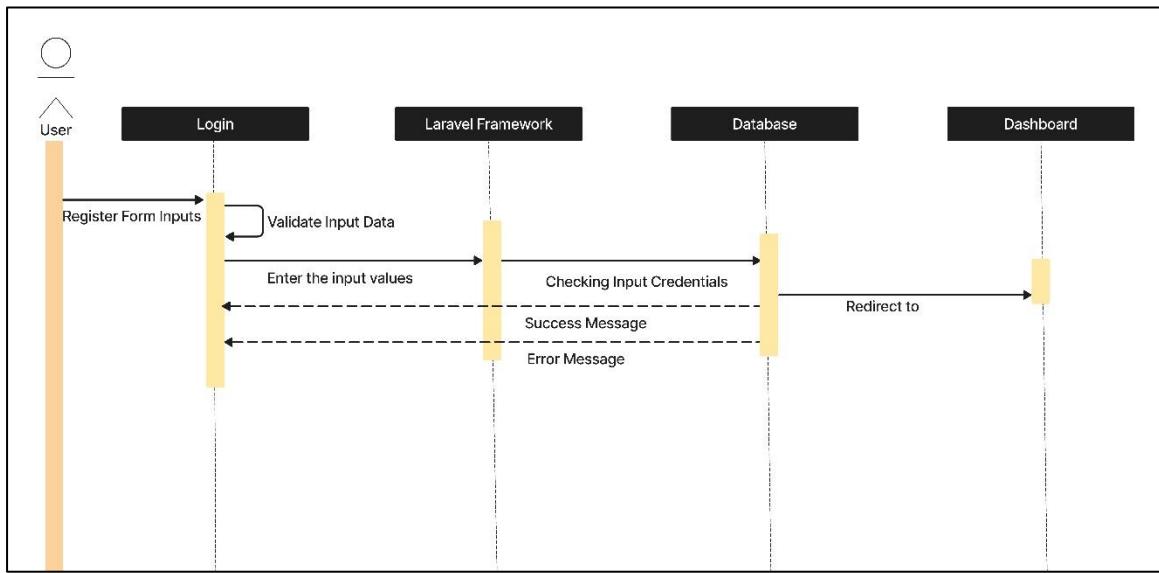


Figure 21: Login sequence diagram

The login sequence diagram offers a graphical depiction of the interactions among system components during the login process over time. It delineates how different elements communicate, showcasing the messages exchanged and their temporal sequence. Specifically, within our HR management system, the login sequence diagram outlines the series of steps involved in user authentication and access to the system. By illustrating the flow of actions during login, this diagram provides a comprehensive understanding of how user credentials are verified and authenticated, contributing to the overall functionality and usability of the system.

6.1.4 Flow chart

Admin Flow chart

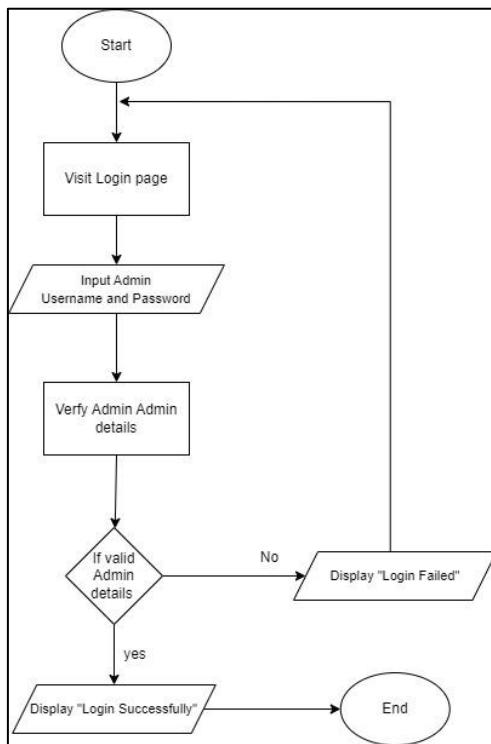


Figure 22: Admin flow chart

User Flow Chart

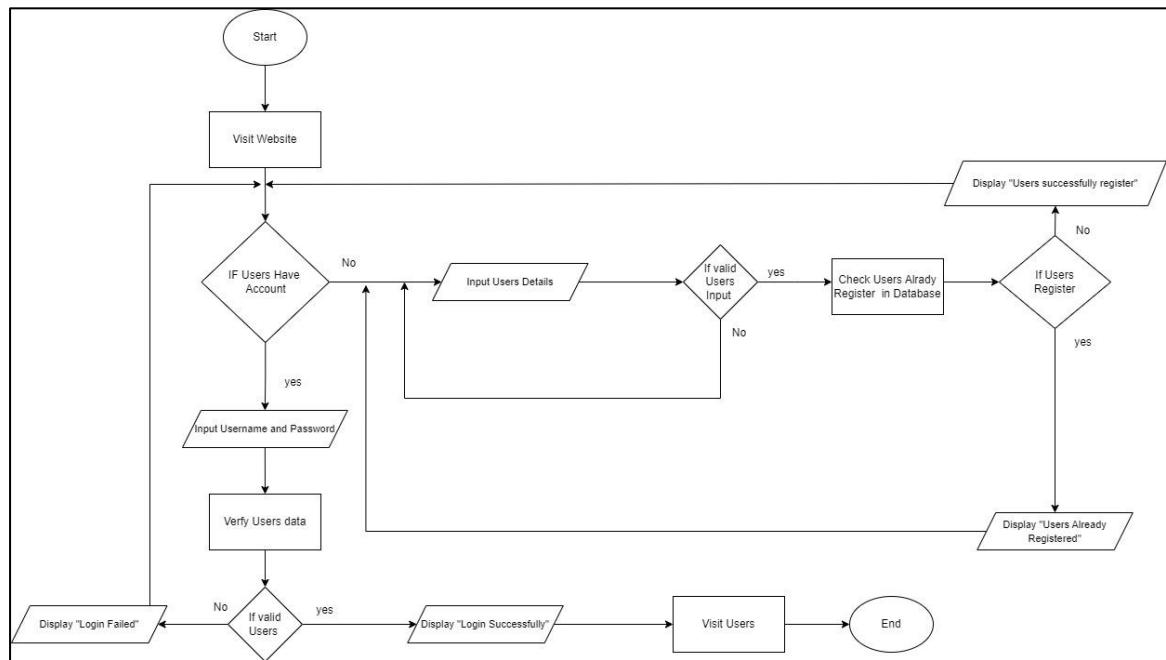


Figure 23: User flow chart

6.2 UI Wireframe

UI wireframes are fundamental schematics delineating the visual arrangement and framework of an application's interface. They are pivotal in enriching user experience by simplifying navigation and minimizing complexity. Our project places a high emphasis on crafting an intuitive and user-friendly frontend interface. To accomplish this, significant time and effort were invested in meticulously designing each UI element. These wireframes offer a detailed depiction of the interface, offering insights into component placement and interaction flow for end-users.

6.2.1 Login Page

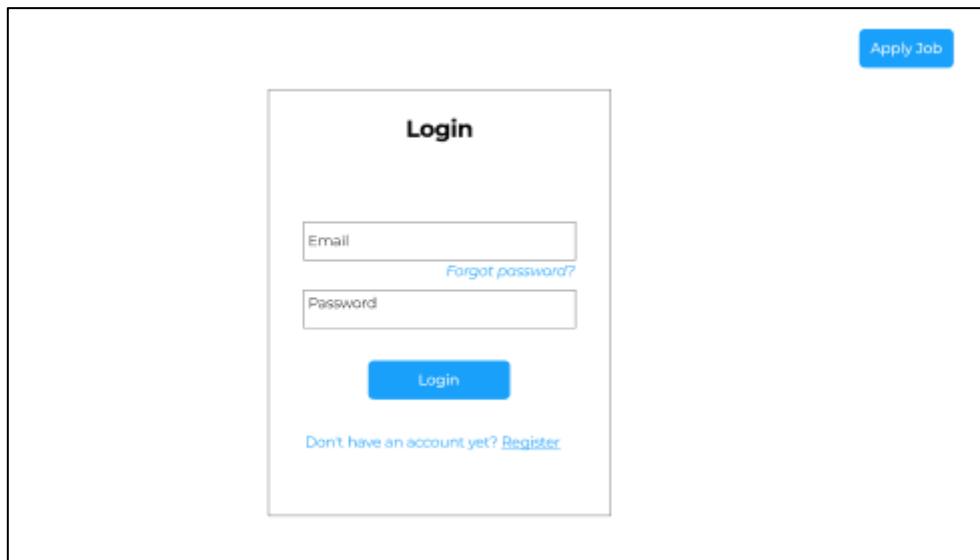


Figure 24: Login page

6.2.2 Dashboard



Figure 25: Dashboard

6.2.3 Employee Management



Figure 26: Employee management

6.2.4 Profile

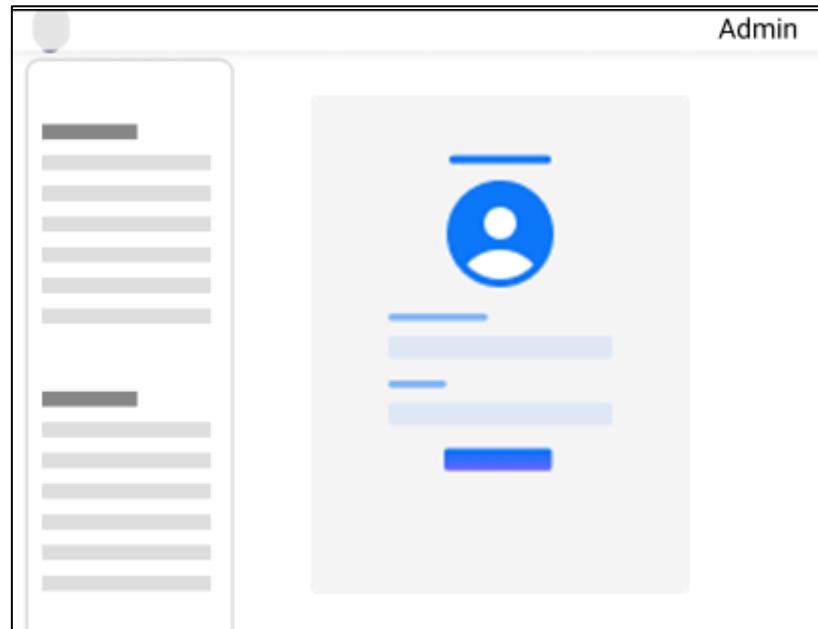


Figure 27: Profile

6.2.5 Activity



Figure 28: Activity

CHAPTER 7 - Implementation of the system

The implementation phase of the project encompasses the execution of all planned activities outlined in the project plan. As part of this phase, real-life sample data has been incorporated into the database to provide a tangible demonstration of the system's functionality. The sample data collected is sourced from a medium-sized organization, aligning closely with the requirements specified in our system design. Minor adjustments have been made to the database structure to ensure compatibility with the organization's data. To uphold data confidentiality, certain records have been obscured in the evidence or screenshots provided.

7.1 Developed Database

All Tables

Table	Action	Rows	Type	Collation	Size	Overhead
assets	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
clients	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
contacts	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
departments	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
designations	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
employees	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
employee_attendances	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
expenses	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
failed_jobs	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
goals	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
goal_types	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
holidays	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
invoices	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	64.0 Kib	-
jobs	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
job_applicants	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
leaves	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
leave_types	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
migrations	Console	0				
model_has_permissions	Browse Structure Search Insert Empty Drop	0				
model_has_roles	Browse Structure Search Insert Empty Drop	0				
notifications	Browse Structure Search Insert Empty Drop	0				
overtimes	Browse Structure Search Insert Empty Drop	1				
password_resets	Browse Structure Search Insert Empty Drop	0				
password_reset_tokens	Browse Structure Search Insert Empty Drop	0				
permissions	Browse Structure Search Insert Empty Drop	0				
personal_access_tokens	Browse Structure Search Insert Empty Drop	0				
polices	Browse Structure Search Insert Empty Drop	0				
projects	Browse Structure Search Insert Empty Drop	0				
provident_funds	Browse Structure Search Insert Empty Drop	0				
roles	Browse Structure Search Insert Empty Drop	0				
role_has_permissions	Browse Structure Search Insert Empty Drop	0				
settings	Browse Structure Search Insert Empty Drop	21				
taxes	Browse Structure Search Insert Empty Drop	0				
tickets	Browse Structure Search Insert Empty Drop	0				
users	Browse Structure Search Insert Empty Drop	2				
hrms	Information Schema	35 tables	Sum		1.1 MiB	0 B

Figure 29: All tables 1

Table	Action	Rows	Type	Collation	Size	Overhead
model_has_roles	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
notifications	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
overtimes	Browse Structure Search Insert Empty Drop	1	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
password_resets	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
password_reset_tokens	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
permissions	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
personal_access_tokens	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
polices	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
projects	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
provident_funds	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
roles	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
role_has_permissions	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
settings	Browse Structure Search Insert Empty Drop	21	InnoDB	utf8mb4_unicode_ci	32.0 Kib	-
taxes	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 Kib	-
tickets	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
users	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_unicode_ci	48.0 Kib	-
hrms	Information Schema	35 tables	Sum		1.1 MiB	0 B
information_schema	Console	79				

Figure 30: All tables 2

Assets table

The screenshot shows the MySQL Workbench interface with the 'assets' table selected. The table has 17 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	<code>id</code>	<code>bigint(20)</code>		<code>UNSIGNED</code>	No	<code>None</code>		<code>AUTO_INCREMENT</code>	Change Drop More
2	<code>uuid</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
3	<code>name</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
4	<code>purchase_date</code>	<code>date</code>			No	<code>None</code>			Change Drop More
5	<code>purchase_from</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
6	<code>manufacturer</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
7	<code>model</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
8	<code>serial_number</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
9	<code>supplier</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
10	<code>condition</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
11	<code>warranty</code>	<code>int(11)</code>			Yes	<code>NULL</code>			Change Drop More
12	<code>value</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
13	<code>description</code>	<code>text</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
14	<code>status</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>approved</code>			Change Drop More
15	<code>created_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More
16	<code>updated_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More
	<code>deleted_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More

Figure 31: Assets table

Clients table

The screenshot shows the MySQL Workbench interface with the 'clients' table selected. The table has 11 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	<code>id</code>	<code>bigint(20)</code>		<code>UNSIGNED</code>	No	<code>None</code>		<code>AUTO_INCREMENT</code>	Change Drop More
2	<code>firstname</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
3	<code>lastname</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
4	<code>email</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
5	<code>phone</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
6	<code>company</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		No	<code>None</code>			Change Drop More
7	<code>avatar</code>	<code>varchar(255)</code>	<code>utf8mb4_unicode_ci</code>		Yes	<code>NULL</code>			Change Drop More
8	<code>deleted_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More
9	<code>created_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More
10	<code>updated_at</code>	<code>timestamp</code>			Yes	<code>NULL</code>			Change Drop More

Figure 32: Clients table

Department table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	created_at	timestamp			Yes	NULL			Change Drop More
4	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 33: Department table

Designation table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	department_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
4	created_at	timestamp			Yes	NULL			Change Drop More
5	updated_at	timestamp			Yes	NULL			Change Drop More

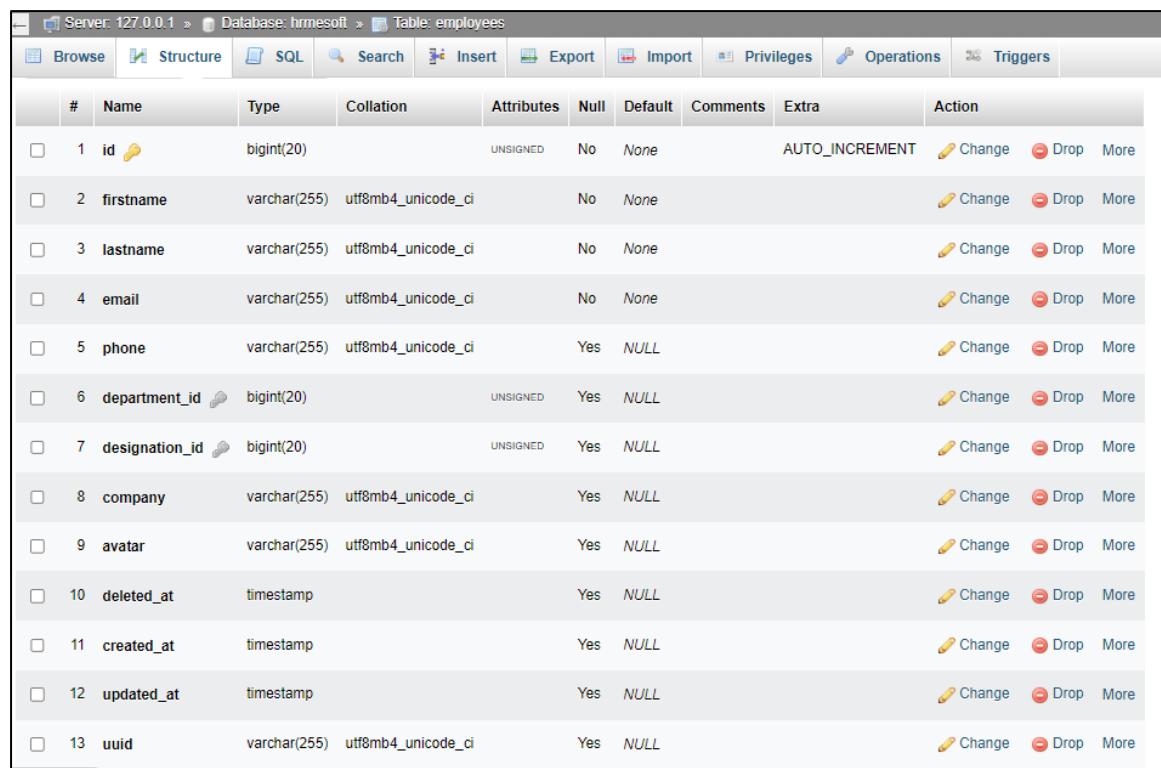
Figure 34: Designation table

Employee attendance table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	employee_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
3	checkin	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
4	checkout	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
5	status	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
6	created_at	timestamp			Yes	NULL			Change Drop More
7	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 35: Employee attendance table

Employee table

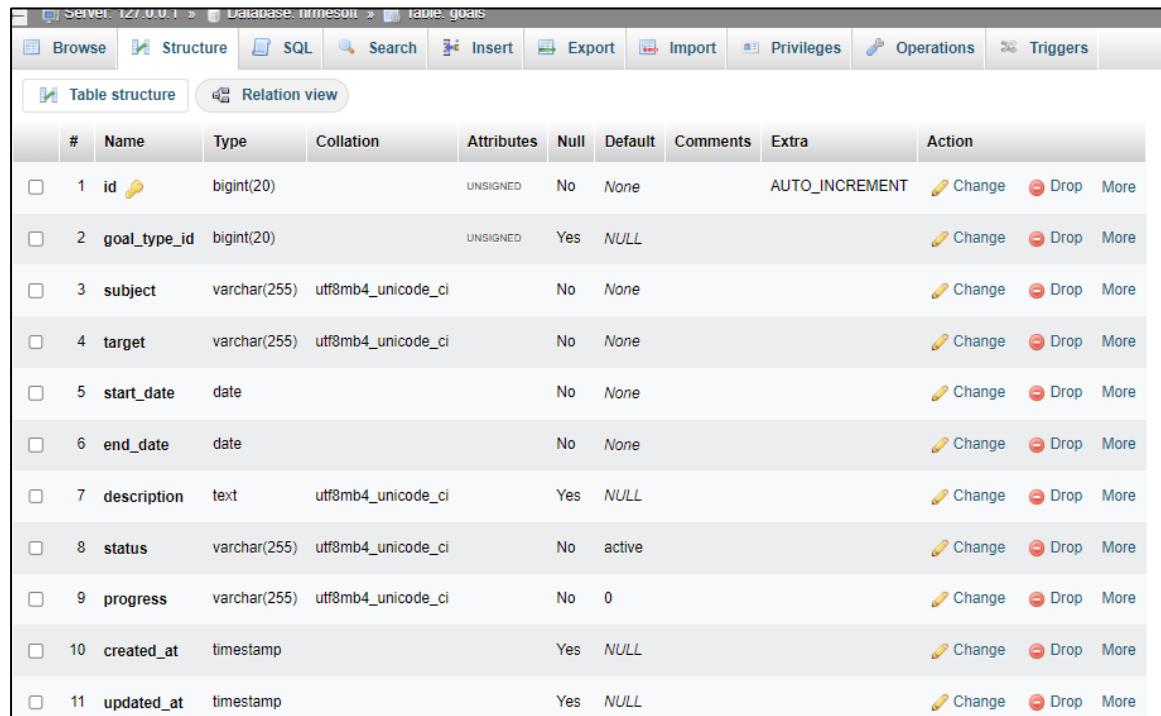


The screenshot shows the 'employees' table structure in MySQL Workbench. The table has 13 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	firstname	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	lastname	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	email	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	phone	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
6	department_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
7	designation_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
8	company	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
9	avatar	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
10	deleted_at	timestamp			Yes	NULL			Change Drop More
11	created_at	timestamp			Yes	NULL			Change Drop More
12	updated_at	timestamp			Yes	NULL			Change Drop More
13	uuid	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More

Figure 36: Employee table

Goals table



The screenshot shows the 'goals' table structure in MySQL Workbench. The table has 11 columns:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	goal_type_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
3	subject	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	target	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	start_date	date			No	None			Change Drop More
6	end_date	date			No	None			Change Drop More
7	description	text	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
8	status	varchar(255)	utf8mb4_unicode_ci		No	active			Change Drop More
9	progress	varchar(255)	utf8mb4_unicode_ci		No	0			Change Drop More
10	created_at	timestamp			Yes	NULL			Change Drop More
11	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 37: Goals table

Holiday table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	holiday_date	date			No	None			Change Drop More
4	completed	tinyint(1)			No	0			Change Drop More
5	created_at	timestamp			Yes	NULL			Change Drop More
6	updated_at	timestamp			Yes	NULL			Change Drop More

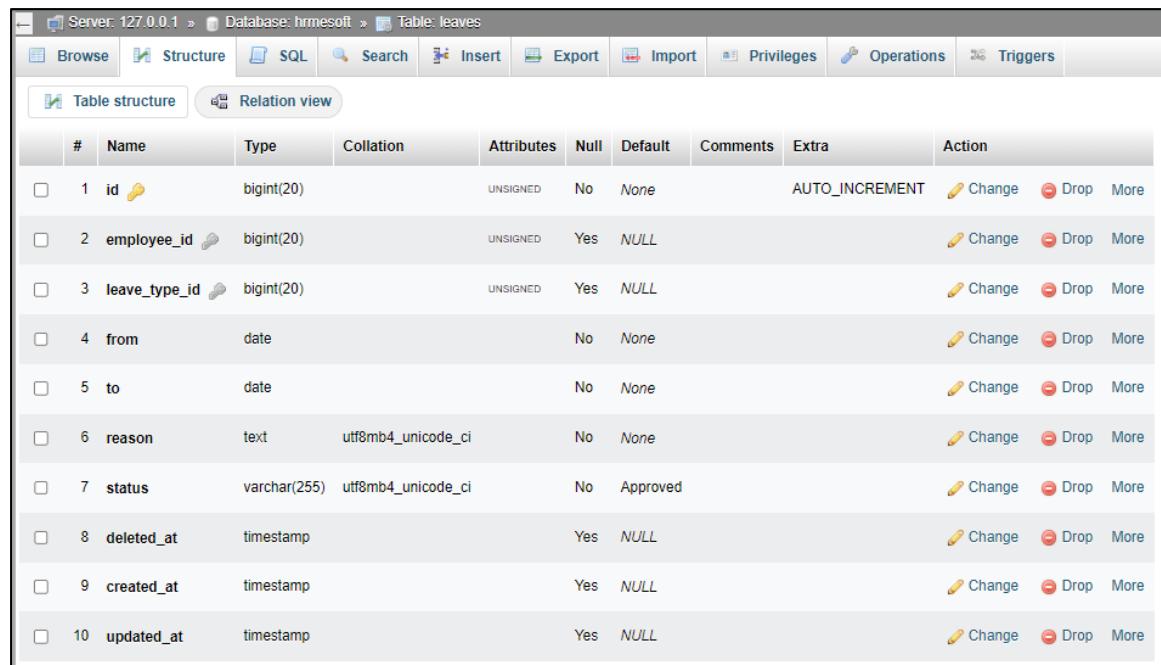
Figure 39: Holiday table

Jobs table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	title	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	department_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
4	location	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	vacancies	int(11)			No	None			Change Drop More
6	experience	int(11)			No	None			Change Drop More
7	age	int(11)			Yes	NULL			Change Drop More
8	salary_from	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
9	salary_to	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
10	type	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
11	status	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
12	start_date	date			No	None			Change Drop More
13	expire_date	date			No	None			Change Drop More
14	description	text	utf8mb4_unicode_ci		No	None			Change Drop More
Console	deleted_at	timestamp			Yes	NULL			Change Drop More

Figure 38: Jobs table

Leave table



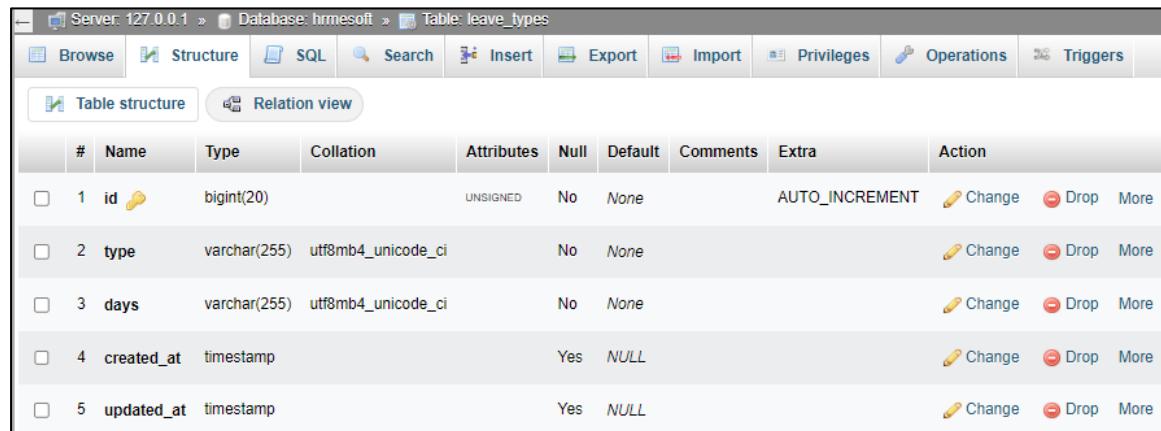
The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** hrmesoft
- Table:** leaves
- Table Structure View:** Selected
- Columns:**

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	employee_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
3	leave_type_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
4	from	date			No	None			Change Drop More
5	to	date			No	None			Change Drop More
6	reason	text	utf8mb4_unicode_ci		No	None			Change Drop More
7	status	varchar(255)	utf8mb4_unicode_ci		No	Approved			Change Drop More
8	deleted_at	timestamp			Yes	NULL			Change Drop More
9	created_at	timestamp			Yes	NULL			Change Drop More
10	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 40: Leave table

Leave type table



The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** hrmesoft
- Table:** leave_types
- Table Structure View:** Selected
- Columns:**

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	type	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	days	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	created_at	timestamp			Yes	NULL			Change Drop More
5	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 41: Leave types table

Overtimes table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	employee_id	bigint(20)		UNSIGNED	Yes	NULL			Change Drop More
3	overtime_date	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	hours	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	description	text	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
6	created_at	timestamp			Yes	NULL			Change Drop More
7	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 42: Overtimes table

Roles table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	guard_name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	created_at	timestamp			Yes	NULL			Change Drop More
5	updated_at	timestamp			Yes	NULL			Change Drop More

Figure 43: Roles table

Users table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint(20)		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	email	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	username	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	email_verified_at	timestamp			Yes	NULL			Change Drop More
6	password	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
7	avatar	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
8	remember_token	varchar(100)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
9	created_at	timestamp			Yes	NULL			Change Drop More
10	updated_at	timestamp			Yes	NULL			Change Drop More
11	deleted_at	timestamp			Yes	NULL			Change Drop More

Figure 44: Users table

7.2 Developed Front-End

Login

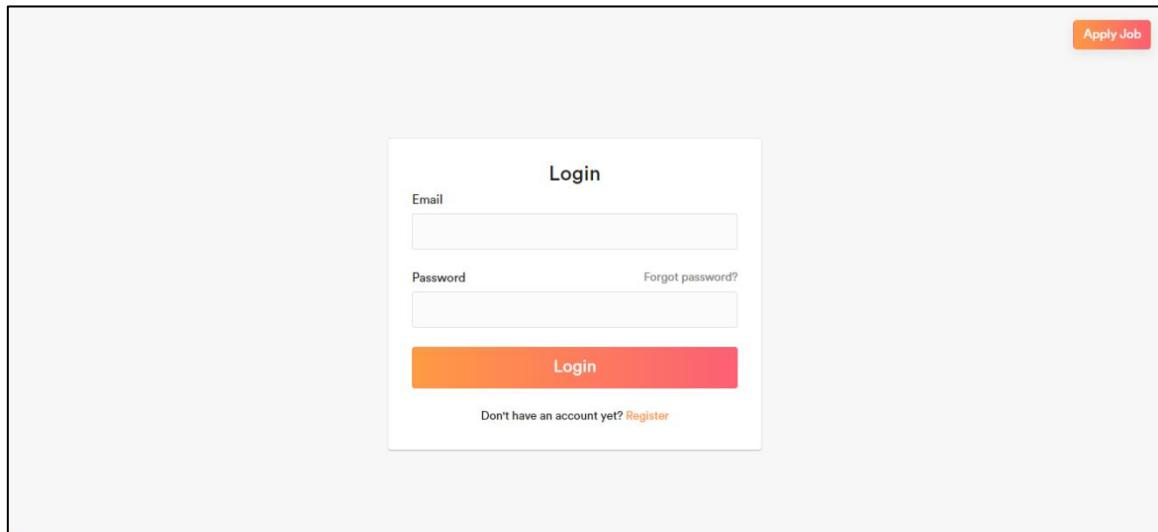


Figure 45: Login page

The login page serves as the initial access point for the HR management system, enabling users to securely log in to their accounts. It features fields for entering user credentials, typically including email and password, ensuring authentication and user verification. Additionally, the login page may provide options for password recovery and account registration. New user accounts require approval from the system administrator before gaining access to the system.

Contact page

Main		HRM	admin
Dashboard			
Apps			
Employees		Contacts	
Employees		Dashboard / Contacts	
Clients			
Projects			
Leads			
Tickets			
HR			
Accounts			
Policies			
Jobs			
Goals			

Figure 46: Contact page

Dashboard

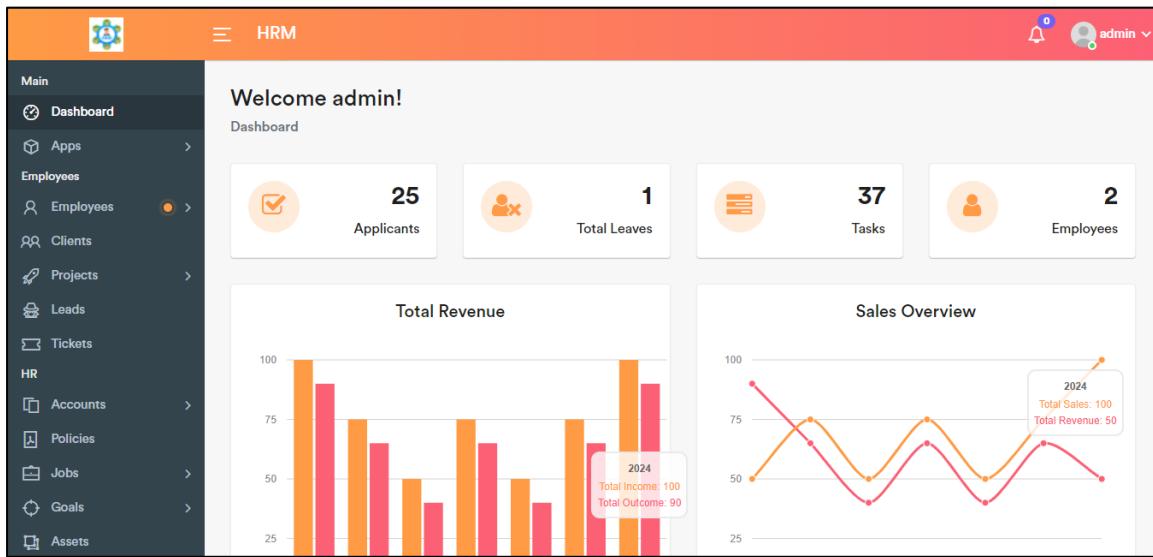


Figure 48: Dashboard 1

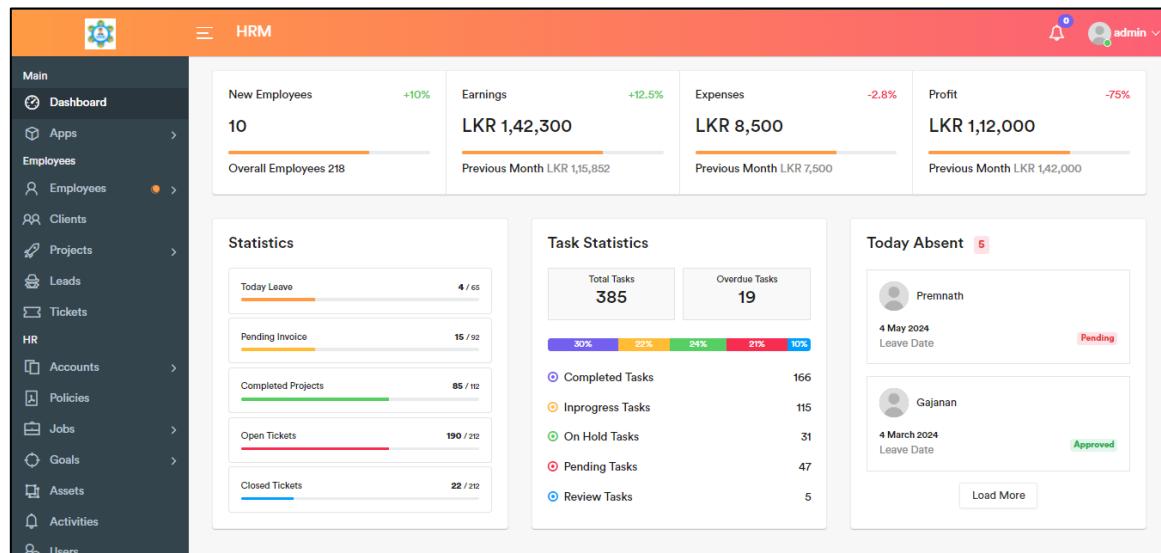


Figure 47: Dashboard 2

The dashboard acts as the main page of our HR management solution, offering quick access to vital HR features like employee count, leave management, today absents, statistics and task tracking. It also includes graphical representations of key metrics such as total revenue and leave distribution, providing users with a clear overview of important data trends.

Employee management page

The screenshot shows the 'Employee' section of the HRM system. On the left, a sidebar menu includes 'Dashboard', 'Apps', 'Employees' (selected), 'Leaves (Employee)', 'Designations', 'Overtime', 'Clients', and 'Projects'. The main area displays three employee profiles in a grid:

- Sri Priya** (Lecturer)
- Premnath Stephen** (Lecturer)
- Harihara Ganapathy** (Lecturer)

At the top right, there are icons for notifications (0), user profile ('admin'), and a button to '+ Add Employee'.

Figure 50: Employee management 1

The screenshot shows the same 'Employee' section, but the data is presented in a table format. The table has columns for Name, Employee ID, Email, Mobile, Join Date, Designation, and Action. Three rows of data are visible:

Name	Employee ID	Email	Mobile	Join Date	Designation	Action
Harihara Ganapathy	EMP-003	hari@gmail.com	0774543234	04 May,2024	Lecturer	⋮
hariharaganapathy Ganapathypillai	EMP-001	hari@gmail.com	0774543234	04 May,2024	Lecturer	⋮
Premnath Stephen	EMP-002	prem@gmail.com	0775643232	04 May,2024	Lecturer	⋮

On the left, the sidebar menu is identical to Figure 50. At the top right, there are icons for notifications (0), user profile ('admin'), and a button to '+ Add Employee'. A blue box highlights the 'Table' icon in the top right corner of the interface.

Figure 49: Employee management 2

The employee management page offers comprehensive functionalities for managing employee data efficiently. Users can create, edit, and delete employee profiles, ensuring accurate and up-to-date records. The search feature allows users to quickly find specific employee information, enhancing productivity and workflow efficiency. Users can view employee details in both card and table formats, providing flexibility in data presentation. The ability to switch between card and table views enables users to customize their viewing preferences based on their needs and preferences.

Holiday page

Title	Holiday Date	Day	Action
Poya	24 March 2024	Thu	⋮
Navarathri	02 May 2024	Thu	⋮

Figure 51: Holiday page

The holiday page facilitates seamless management of holidays within the organization. Users can create, edit, and delete holiday entries, ensuring accurate tracking of holiday schedules. The search functionality enables quick retrieval of specific holiday information, enhancing administrative efficiency.

Attendance page

Employee	TimeIn	TimeOut	Date	Status	Action
hariharaganapathy Ganapathypillai Lecturer	08:50 am	17:35 pm	04 May, 2023	ontime	⋮
Premnath Stephen Lecturer	08:37 am	17:03 pm	04 May, 2024	late	⋮

Figure 52: Attendance page

The Attendance page enables users to add, edit, delete, and search attendance records. It allows for recording check-in and check-out times, facilitating real-time attendance tracking and management.

Leave Type

Leave Type	Leave Days	Action
Annual Leave	14 days	⋮
Sick Leave	5 days	⋮

Figure 53: Leave type

The Leave type page facilitates the administration of leave types. Users can add, edit, delete, and search for leave types in the master database. This functionality ensures efficient management and customization of leave categories according to organizational policies and requirements.

Leave page

Leave Type	From	To	No of Days	Reason	Status	Employee	Actions
Sick Leave	02 May, 2024	04 May, 2024	3 Days	Sick Leave.....	Approved	Sri Priya	⋮

Figure 54: Leave page

The Leave page allows users to oversee employee leave requests, granting approval or rejection based on company policies. Users can add, edit, delete, and search for leave records, ensuring accurate and streamlined management of employee absences.

Department

#	Department Name	Action
1	IT	⋮
2	BM	⋮

Figure 55: Department

The Department page facilitates the administration of organizational departments within the HRMS. Users can add, edit, and delete department records, ensuring accurate representation of the organizational structure. Users can search for specific departments, streamlining navigation and management tasks.

Designation

#	Designation	Department	Action
1	Lecturer	IT	⋮

Figure 56: Designation

The Designation page enables the administration of job designations within the HRMS. Users can add, edit, and delete designation records to reflect the organizational hierarchy accurately. The page allows users to search for specific designations, facilitating efficient navigation and management of job roles.

Over Time

The screenshot shows the 'Employee OverTime' page. The left sidebar has a dark theme with orange highlights for 'Employees' and 'Overtime'. The main content area has an orange header with the title 'Employee OverTime' and a sub-header 'Dashboard / Overtime'. It includes a search bar, a table with columns for '#', 'Name', 'OT Date', 'OT Hours', 'Description', and 'Actions', and a message 'Showing 1 to 1 of 1 entries'. A single entry for 'Sri Priya' is listed with details: OT Date: Sat May 2024, OT Hours: 4, Description: Extra work, and Actions: three dots.

Figure 57: Over time page

The Overtime page facilitates the administration of overtime records within the HRMS. Users can add, delete, edit, and search for overtime entries. The page includes fields to input the overtime date and hours worked, enabling the calculation of employee overtime salary based on predetermined rates.

Client management

The screenshot shows the 'Clients' page. The left sidebar has a dark theme with orange highlights for 'Clients'. The main content area has an orange header with the title 'Clients' and a sub-header 'Dashboard / Clients'. It includes a search bar, a table with columns for 'Name', 'Client ID', 'Contact Person', 'Email', 'Mobile', and 'Action', and a message 'Showing 1 to 1 of 1 entries'. A single entry for 'Global Technologies' is listed with details: Client ID: CLT-1, Contact Person: Saji pragas, Email: sajipragas20001109ss@gmail.com, Mobile: 0778503961, and Action: three dots.

Figure 58: Client management

The Client feature enables users to oversee and manage client information within the system. Users can add, delete, edit, and search for client records, allowing for efficient management of client relationships and interactions.

Invoice

#	Invoice Number	Client	Invoice Date	Due Date	Amount	Status	Action
1	INV-00001	Tamil Arasan	04 May, 2024	04 May, 2024	Rs. 4000	Paid	⋮

Figure 59: Invoice page

The Invoice Management feature facilitates the creation, editing, deletion, and searching of invoices within the system. Users can generate invoices, update them as needed, and track them efficiently.

Provident funds

Employee Name	Provident Fund Type	Employee Share	Organization Share	Actions
Harihara Ganapathy Lecturer	Fixed	2%	2%	⋮

Figure 60: Provident funds

The Provident Funds Management module allows organizations to manage both the employer's and employee's contributions to the provident fund. It includes functionalities for tracking and managing the organization's share as well as the employee's share in the fund.

Taxes

#	Tax Name	Tax Percentage (%)	Status	Action
1	Tax 1	8%	Active	⋮

Figure 61: Taxes

The Taxes Management module facilitates the creation, editing, deletion, and searching of tax records within the system. It provides a centralized platform for managing various types of taxes applicable to the organization. Users can efficiently handle tax-related tasks such as adding new tax records, updating existing ones, removing obsolete entries, and searching for specific tax details as needed.

Policy Management

Policy Name	Department	Description	Created	Action
Leave	IT	Leave Policies	04 May 2024	⋮

Figure 62: Policy management page

The Policy Management module enables users to add, delete, edit, and search organization policies within the system. It offers a centralized repository for managing a variety of organizational policies, allowing users to easily create new policies, modify existing ones, remove outdated policies, and search for specific policy information as required.

Manage Jobs

Job Title	Department	Start Date	Expire Date	Job Type	Status	Actions
Intern	IT	28 Apr, 2024	05 May, 2024	Internship	Open	⋮

Figure 63: Jobs

The Manage Jobs Vacancies module facilitates the administration of job vacancies within the organization. Users can add new job vacancies, edit existing ones, delete outdated vacancies, and search for specific vacancies as needed. Prospective candidates can apply for available positions directly through the system.

Job Applicants

Position	Name	Email	Apply Date	Status	Resume	Actions
	Sajipragas	sajipragas@gmail.com	6 months ago	New	Download	⋮

Figure 64: Job Applicants

The Job Applicants module enables users to manage job applicants within the system. Users can view, evaluate, and manage the applications submitted by candidates for various job vacancies. This includes reviewing applicant details, updating application statuses, scheduling interviews, and communicating with candidates throughout the recruitment process.

Goal Tracking

The screenshot shows the 'Goal Tracking' section of the HRM system. The left sidebar has a 'Goals' section expanded, with 'Goal List' selected. The main area displays a table with one row of data:

Goal Type	Subject	Target Achievement	Start Date	End Date	Description	Status	Progress	Action
Monthly	Developer	Yes	2024-03-15	2024-05-02	find your goal	Active	Completed 87 %	⋮

Below the table, it says 'Showing 1 to 1 of 1 entries'. The top right has a search bar and an orange '+ Add New' button.

Figure 65: Goal Tracking

The Goal Tracking Management module facilitates the monitoring and management of employee goals within the organization. Users can set, track, and evaluate individual and team goals to ensure alignment with organizational objectives. This module allows for the creation, editing, and deletion of employee goals, as well as the ability to track progress, assign tasks, and provide feedback to employees. Users can generate reports to assess goal achievement and performance metrics across the organization.

Activities

The screenshot shows the 'Activities' page of the HRM system. The left sidebar has a 'Goals' section expanded, with 'Activities' selected. The main area lists recent activity items:

- Sajipragas added new task 4 mins ago
- Premnath added Loren Gatlin and Tarah Shropshire to project 6 mins ago
- Gajanan completed task 12 mins ago
- Hariganapathy changed the task name 1 day ago
- Sethuparan added new task 2 days ago
- Arjuna added Thuvaragan and Hariarthan to the task of 7 days ago

Figure 66: Activities page

The Employee Activities page provides a comprehensive view of employee activities within the organization. It displays a consolidated list of all activities performed by employees, including tasks completed, projects worked on, meetings attended, and any other relevant actions. This page offers insights into the daily workflow and productivity of employees, allowing managers to track their activities and ensure alignment with organizational objectives.

User Management

Name	Username	Email	Created Date	Action
Prem	Premath	prem@gmail.com	02 May, 2024	⋮
Sajipragas	admin	saji@admin.com	04 May, 2024	⋮

Figure 67: User management

The User Management page empowers administrators to oversee user accounts efficiently. It enables administrators to perform essential actions such as adding, deleting, editing, searching, and viewing user profiles. This functionality ensures that administrators have full control over user access and permissions within the system, facilitating effective user management and security.

Change Password

Figure 68: Change password

The Change Password feature allows users to update their login credentials securely. Users are prompted to input their old password, followed by the new password and confirmation of the new password. This process ensures authentication of the user's identity and prevents unauthorized changes to their account information.

Backups

DISK	HEALTHY	AMOUNT OF BACKUPS	NEWEST BACKUP	USED STORAGE
local	×	0	No backups present	0 B

Figure 69: Backups

The Backup Management functionality empowers users to protect vital files, data, and databases through backup creation and administration. Users can commence backup operations to replicate crucial files and database records, guaranteeing redundancy and readiness for disaster recovery.

Add Employee

The screenshot shows the 'Add Employee' form. It has two columns of input fields. The left column contains 'First Name *' (with a placeholder), 'Email *' (with a placeholder), 'Company' (with a placeholder), and 'Designation *' (with a dropdown menu). The right column contains 'Last Name' (with a placeholder), 'Phone' (with a placeholder), 'Department *' (with a dropdown menu), and 'Employee Picture*' (with a file input field showing 'Choose File' and 'No file chosen'). At the bottom is an orange 'Submit' button.

Figure 70: Add employee

To add a new employee, users can access the Add employee page and populate the fields with relevant employee details. Once all necessary information is entered, users can proceed to create a new employee entry by submitting the form.

Add Holiday

The screenshot shows the 'Add Holiday' form. It has two input fields: 'Holiday Name *' (with a placeholder) and 'Holiday Date *' (with a date picker icon). At the bottom is an orange 'Submit' button. To the right of the form, there is a table titled 'Holidays' with columns 'Day' and 'Action'. It lists two entries: 'Thu' and another 'Thu' entry with three dots in the 'Action' column.

Figure 71: Add holiday

To add a new holiday, users can access the Add Holiday page and populate the fields with the holiday name and date. Once all necessary information is entered, users can proceed to create a new holiday entry by submitting the form.

Add Leave

The screenshot shows the 'Add Leave' page. The main menu on the left includes options like Dashboard, Apps, Employees, Holidays, Attendance, Leave Type, Leaves (Employees), Departments, Designations, Overtime, Clients, Projects, Leads, Tickets, HR, Accounts, and Policies. The central area displays a list of leaves for 'Dashboard / Leaves'. A modal window titled 'Add Leave' is open, containing fields for 'Employee' (set to Premnath Stephen), 'Leave Type' (set to Annual Leave), 'From' (02 May, 2024), 'To' (04 May, 2024), 'Leave Reason' (a text area), and 'Status' (a dropdown menu). An orange 'Submit' button is at the bottom of the modal.

Figure 72: Add Leave

To add a new leave record, users can navigate to the Add Leave page and input the relevant details into the designated fields. After completing the necessary fields, users can proceed to create a new leave entry by submitting the form.

Add Department

To add a new department, users can access the Add Department page, where they will fill in the department details, such as the department name, in the provided fields. After inputting the required information, users can proceed to create the new department by clicking on the "submit" button.

The screenshot shows the 'Add department' page. The main menu on the left is identical to Figure 72. The central area displays a list of departments for 'Dashboard / Department'. A modal window titled 'Add Department' is open, containing a single field for 'Department Name' and an orange 'Submit' button.

Figure 73: Add department

Add Designation

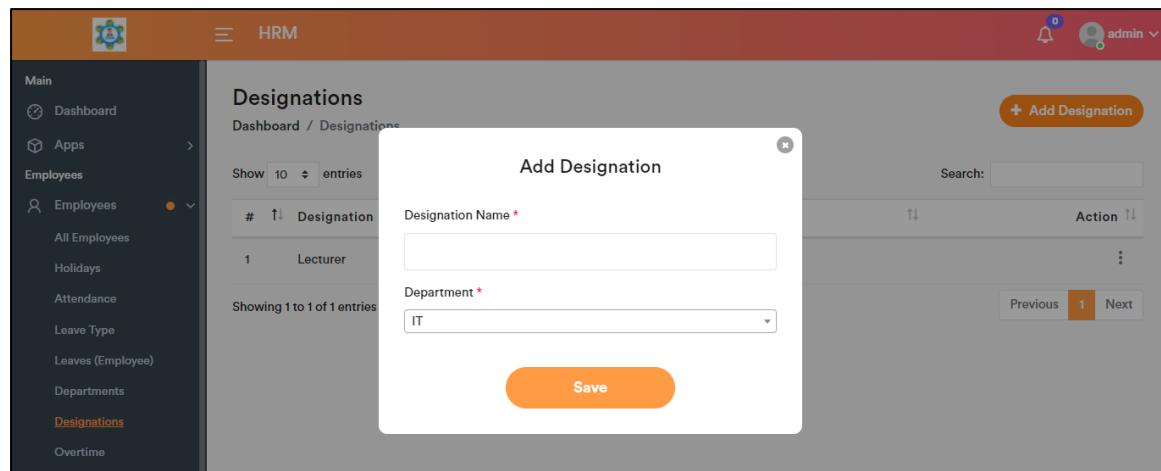


Figure 74: Add designation

To add a new designation, users can navigate to the Add Designation page. Here, It will input the designation details, including the designation name and the department to which it belongs, in the designated fields. Once the necessary information is filled out, users can proceed to create the new designation by selecting the create option.

Edit Profile

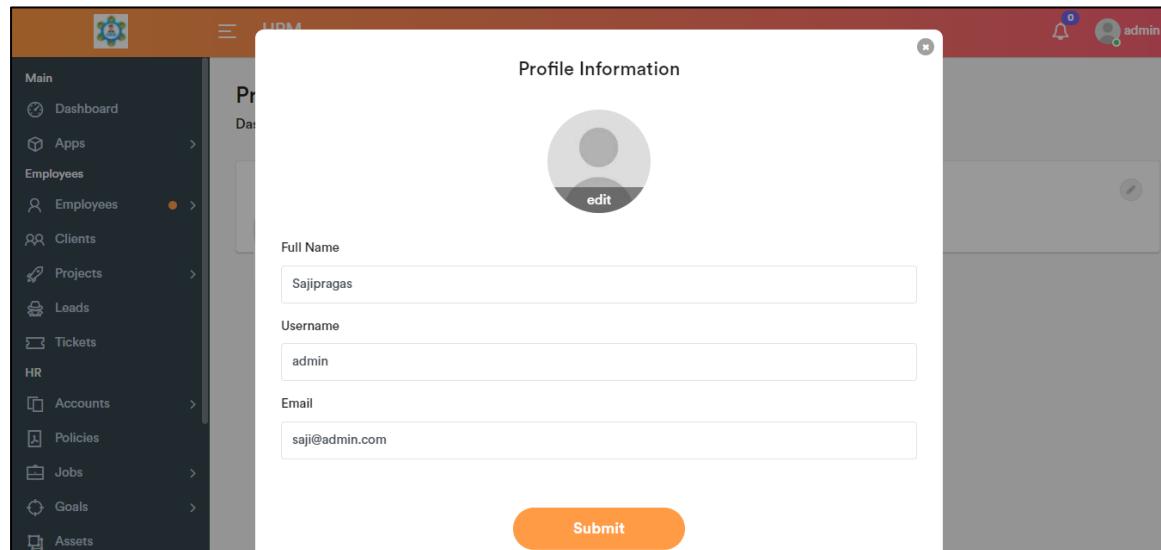


Figure 75: Edit profile

Users can modify their profiles by accessing the Edit Profile section, where it can directly adjust profile details within the model. Once the desired changes are made to the profile fields, users can save the updated information to complete the editing process.

Reports Generate

Employee	Leave Type	From	To	Reason	Status
Harihara Ganapathy	Medical Leave	2024-06-19	2024-06-18	sick	Declined
hariharaganapathy Ganapathyillai	Sick Leave	2023-10-02	2023-10-04	Sick Leave	Approved
Thuvaragan Sutha	Sick Leave	2024-03-11	2024-03-15	Sick	Pending

Figure 76: Reports Generate

The Report generate page provides a summary of employee leave details, including the employee name, leave type, date range, reason, and status. Users can view a list of entries, search for specific records, and navigate through multiple pages of data. The report can be exported as a PDF or Excel file using the "Export" button on the right.

Employee	Leave Type	From	To	Reason	Status
hariharaganapathy Ganapathyillai	Sick Leave	2023-10-02	2023-10-04	Sick Leave	Approved
Thuvaragan Sutha	Sick Leave	2024-03-11	2024-03-15	Sick	Pending
Harihara Ganapathy	Medical Leave	2024-06-19	2024-06-18	sick	Declined

Figure 77: PDF Export

	A	B	C	D	E	F	G	I	J	K	L	M	N	O	P
1	1	1	2	2023-10-02	2023-10-0 Sick Leave Approved 2023-09-31 2023-09-31 hariharaganapathyillai										
2	2	6	2	2024-03-12	2024-03-12 Sick Leave Pending 2024-06-01 2024-06-01 Thuvaragan Sutha										
3	3	3	3	2024-06-01	2024-06-01 sick Declined 2024-06-01 2024-06-01 Harihara Ganapathy										

Figure 78: Excel Export

7.3 Code Snippets

API's Routes

```

41     /*
42      *
43      */
44
45     Route::group(['middleware'=>'guest'], function (){
46         Route::get('register',[RegisterController::class,'index'])->name('register');
47         Route::post('register',[RegisterController::class,'store']);
48         Route::get('login',[LoginController::class,'index'])->name('login');
49         Route::post('login',[LoginController::class,'login']);
50     });
51
52     Route::get('forgot-password',[ForgotPasswordController::class,'index']->name('forgot-password'));
53     Route::post('forgot-password',[ForgotPasswordController::class,'reset']);
54
55     Route::get('job-list',[JobController::class,'index'])->name('job-list');
56     Route::get('job-view/{job}',[JobController::class,'show'])->name('job-view');
57     Route::post('apply',[JobApplicationController::class,'store'])->name('apply-job');
58
59     Route::group(['middleware'=>'auth'], function (){
60
61         Route::get('dashboard',[DashboardController::class,'index'])->name('dashboard');
62         Route::post('logout',[LogoutController::class,'index'])->name('logout');
63
64         //apps routes
65
66         Route::get('contacts',[ContactController::class,'index'])->name('contacts');
67         Route::post('contacts',[ContactController::class,'store']);
68
69     });
70
71     //apps routes
72
73     Route::get('employees',[EmployeeController::class,'index']);
74     Route::post('employees',[EmployeeController::class,'store']);
75
76 }

```

Tue Feb 20 20:46:23 2024] 127.0.0.1:51973 Closing
Tue Feb 20 20:46:23 2024] 127.0.0.1:51974 Closing

Figure 79: API's routes code

API Code

```

12     class EmployeeController extends Controller
13     {
14         public function store(Request $request)
15         {
16             $this->validate($request,[

17                 'firstname'=>'required',
18                 'lastname'=>'required',
19                 'email'=>'required|email',
20                 'phone'=>'nullable|max:15',
21                 'company'=>'required|max:200',
22                 'avatar'=>'file|image|mimes:jpg,jpeg,png,gif',
23                 'department'=>'required',
24                 'designation'=>'required',
25             ]);
26             $imageName = Null;
27             if ($request->hasfile('avatar')){
28                 $imageName = time().'.'.$request->avatar->extension();
29                 $request->avatar->move(public_path('storage/employees'), $imageName);
30             }
31             $uuid = IdGenerator::generate(['table' => 'employees', 'field'=> 'uuid', 'length' => 7, 'prefix' =>'EMP-']);
32             Employee::create([
33                 'uuid' =>$uuid,
34                 'firstname'=>$request->firstname,
35                 'lastname'=>$request->lastname,
36                 'email'=>$request->email,
37                 'phone'=>$request->phone,
38                 'company'=>$request->company,
39                 'department_id'=>$request->department,
40             ]);
41         }
42     }

```

Tue Feb 20 20:46:23 2024] 127.0.0.1:51973 Closing
Tue Feb 20 20:46:23 2024] 127.0.0.1:51974 Closing

Figure 80: API code

Database connection

```

1 APP_NAME=Laravel
2 APP_ENV=local
3 APP_KEY=base64:jUgNPkzzUOQ13uXT/8lpWsRVTpgrQhOIIZwvIPfsgsg=
4 APP_DEBUG=true
5 APP_URL=http://localhost
6
7 LOG_CHANNEL=stack
8 LOG_LEVEL=debug
9
10 DB_CONNECTION=mysql
11 DB_HOST=127.0.0.1
12 DB_PORT=3306
13 DB_DATABASE=hrmfinal
14 DB_USERNAME=root
15 DB_PASSWORD=
16
17 BROADCAST_DRIVER=log

```

Figure 81: Database connection

Login

```

1  <?php
2
3  namespace App\Http\Controllers\Auth;
4
5  use App\Http\Controllers\Controller;
6  use Illuminate\Http\Request;
7
8  class LoginController extends Controller
9  {
10     public function index(){
11         $title = "Login";
12         return view('auth.login',compact('title'));
13     }
14
15     public function login(Request $request){
16         $this->validate($request,[
17             'email'=>'required|email',
18             'password'=>'required',
19         ]);
20         $authenticate = auth()->attempt($request->only('email','password'));
21         if(!$authenticate){
22             return back()->with('login_error','Invalid Login Credentials');
23         }
24         return redirect()->route('dashboard');
25     }
26 }
27

```

Figure 82: login code

Register

```

1  <?php
2
3  namespace App\Http\Controllers\Auth;
4
5  use App\Models\User;
6  use Illuminate\Http\Request;
7  use App\Http\Controllers\Controller;
8  use Illuminate\Support\Facades\Hash;
9  use App\Http\Requests\RegisterRequest;
10 use App\Notifications\NewUserNotification;
11
12 class RegisterController extends Controller
13 {
14     public function index(){
15         $title = "Register";
16         return view('auth.register',compact('title'));
17     }
18
19     public function store(RegisterRequest $request){
20
21         $imageName = null;
22         if($request->avatar()){
23             $imageName = time().'.'.$request->avatar->extension();
24             $request->avatar->move(public_path('avatars'), $imageName);
25         }
26         $user = User::create([
27             'name'=>$request->name,
28             'username'=>$request->username,
29             'email'=>$request->email,
30             'password'=>Hash::make($request->password),
31             'avatar'=>$imageName,
32         ]);
33         $user->notify(new NewUserNotification($user));
34         auth()->attempt($request->only('username','password'));
35         return redirect()->route('dashboard');
36
37     }
38 }

```

Figure 83: Register code

Employee

```

24     public function list()
25     {
26         $title="employees";
27         $Designations = Designation::get();
28         $Departments = Department::get();
29         $Employees = Employee::with('department','designation')->get();
30         return view('backend.employees-list',
31             compact('title','designations','departments','employees'));
32     }
33 }

1 reference | 0 overrides
public function store(Request $request)
{
    $this->validate($request,[

        'firstname'=>'required',
        'lastname'=>'required',
        'email'=>'required|email',
        'phone'=>'nullable|max:15',
        'company'=>'required|max:200',
        'avatar'=>'file|image|mimes:jpg,jpeg,png,gif',
        'department'=>'required',
        'designation'=>'required',
    ]);
    $imageName = Null;
    if ($request->hasFile('avatar')){
        $imageName = time().'.'.$request->avatar->extension();
        $request->avatar->move(public_path('storage/employees'), $imageName);
    }
    $uuid = IdGenerator::generate(['table' => 'employees','field'=>'uuid', 'length' => 7, 'prefix' =>'EMP-']);
    Employee::create([
        'uuid' =>$uuid,
        'firstname'=>$request->firstname,
        'lastname'=>$request->lastname,
        'email'=>$request->email,
        'phone'=>$request->phone,
        'company'=>$request->company,
        'department_id'=>$request->department,
        'designation_id'=>$request->designation,
        'avatar' =>$imageName,
    ]);
}

```

Figure 84: Employee code

Password change code

```

3     namespace App\Http\Controllers\Admin;
4
5     use Illuminate\Http\Request;
6     use App\Http\Controllers\Controller;
7     use Illuminate\Support\Facades\Hash;
8
9     3 references | 0 implementations
10    class ChangePasswordController extends Controller
11    {
12        1 reference | 0 overrides
13        public function index(){
14            $title = "Change Password";
15            return view('backend.change-password',compact('title'));
16        }
17
18        1 reference | 0 overrides
19        public function update(Request $request){
20            $this->validate($request,[

21                'old_password' => 'required',
22                'password' => 'required|confirmed'
23            ]);
24            if(password_verify($request->old_password,auth()->user()->password)){
25                auth()->user()->update([
26                    'password' => Hash::make($request->password)
27                ]);
28                return back()->with('success',"User password changed .");
29            }else{
30                return back()->with('danger',"Wrong old password!!!");
31            }
32        }
33    }

```

Figure 85: Password change code

Job applicants and CV download

```

public function store(Request $request)
{
    $this->validate($request, [
        'title' => 'required',
        'department' => 'required',
        'location' => 'required',
        'vacancies' => 'required',
        'experience' => 'required',
        'age' => 'nullable',
        'salary_from' => 'nullable',
        'salary_to' => 'nullable',
        'type' => 'required',
        'status' => 'required',
        'start_date' => 'required',
        'expire_date' => 'required',
        'description' => 'required',
    ]);
    Job::create($request->all());
    return back()->with('success', "Job has been added Posted!!!");
}

1 reference | 0 overrides
public function applicants()
{
    $title = 'Job Applicants';
    $applicants = JobApplicant::with('Job')->latest()->get();
    return view(
        'backend.job-applicants',
        compact(
            'title',
            'applicants'
        )
    );
}

1 reference | 0 overrides
public function downloadCv(Request $request)
{
    $pathToFile = public_path("storage/cv/" . $request->cv);
    return response()->download($pathToFile)->with('success', "Applicant cv has been downloaded");
}

```

Figure 86: Job code & cv download

Mail notification code

```

public function via($notifiable)
{
    return ['mail','database'];
}

/**
 * Get the mail representation of the notification.
 *
 * @param mixed $notifiable
 * @return \Illuminate\Notifications\Messages\MailMessage
 */
0 references | 0 overrides
public function toMail($notifiable)
{
    $url = route('users',[ 'id' => $this->user['id']]);
    return (new MailMessage)
        ->line('A new user has been created')
        ->line($this->user['name'].' created and account with username: '. $this->user['username']. ' and email ' . $this->user['email'])
        ->action('View User', $url)
        ->line('Thank you for using our application!');
}

```

Figure 87: Mail notification code

Employee create code

```

public function store(Request $request)
{
    $this->validate($request,[
        'firstname'=>'required',
        'lastname'=>'required',
        'email'=>'required|email',
        'phone'=>'nullable|max:15',
        'company'=>'required|max:200',
        'avatar'=>'file|image|mimes:jpg,jpeg,png,gif',
        'department'=>'required',
        'designation'=>'required',
    ]);
    $imageName = Null;
    if ($request->hasFile('avatar')){
        $imageName = time().'.'.$request->avatar->extension();
        $request->avatar->move(public_path('storage/employees'), $imageName);
    }
    $uuid = IdGenerator::generate(['table' => 'employees','field'=>'uuid', 'length' => 7, 'prefix' =>'EMP-']);
    Employee::create([
        'uuid' =>$uuid,
        'firstname'=>$request->firstname,
        'lastname'=>$request->lastname,
        'email'=>$request->email,
        'phone'=>$request->phone,
        'company'=>$request->company,
        'department_id'=>$request->department,
        'designation_id'=>$request->designation,
        'avatar'=>$imageName,
    ]);
    return back()->with('success','Employee has been added');
}

```

Figure 88: Employee create code

Employee update code

```

public function update(Request $request)
{
    $this->validate($request,[
        'firstname'=>'required',
        'lastname'=>'required',
        'email'=>'required|email',
        'phone'=>'nullable|max:15',
        'company'=>'required|max:200',
        'avatar'=>'file|image|mimes:jpg,jpeg,png,gif',
        'department'=>'required',
        'designation'=>'required',
    ]);
    if ($request->hasFile('avatar')){
        $imageName = time().'.'.$request->avatar->extension();
        $request->avatar->move(public_path('storage/employees'), $imageName);
    }else{
        $imageName = Null;
    }

    $employee = Employee::find($request->id);
    $employee->update([
        'uuid' => $employee->uuid,
        'firstname'=>$request->firstname,
        'lastname'=>$request->lastname,
        'email'=>$request->email,
        'phone'=>$request->phone,
        'company'=>$request->company,
        'department_id'=>$request->department,
        'designation_id'=>$request->designation,
        'avatar'=>$imageName,
    ]);
    return back()->with('success','Employee details has been updated');
}

```

Figure 89: Employee update code

Employee delete code

```

1 reference | 0 overrides
public function destroy(Request $request)
{
    $employee = Employee::find($request->id);
    $employee->delete();
    return back()->with('success','Employee has been deleted');
}

```

Figure 90: Employee delete code

Profile code

```
namespace App\Http\Controllers\Admin;

use App\Http\Controllers\Controller;
use Illuminate\Http\Request;

3 references | 0 overrides
class UserProfileController extends Controller
{
    1 reference | 0 overrides
    public function index(){
        $title= 'user Profile';
        return view('backend.profile',compact(
            'title'
        ));
    }

    1 reference | 0 overrides
    public function update(Request $request){
        $this->validate($request,[
            'name' => 'required|max:150|min:5',
            'username' => 'required|max:20|min:3',
            'email' => 'required|email',
            'avatar'=>'file|image|mimes:jpg,jpeg,png,gif',
        ]);
        $imageName = auth()->user()->avatar;
        if($request->hasFile('avatar')){
            $imageName = time().'.'.$request->avatar->extension();
            $request->avatar->move(public_path('storage/users'), $imageName);
        }
        auth()->user()->update([
            'name' => $request->name,
            'username'=> $request->username,
            'email' => $request->email,
            'avatar' => $imageName,
        ]);
        return back()->with('success',"user info has been updated");
    }
}
```

Figure 91: Profile code

Employee Model code

```
namespace App\Models;

use App\Models\Department;
use App\Models\Designation;
use Illuminate\Database\Eloquent\Model;
use Haruncpi\LaravelIdGenerator\IdGenerator;
use Illuminate\Database\Eloquent\Factories\HasFactory;

74 references | 0 implements
class Employee extends Model
{
    use HasFactory;

    0 references
    protected $fillable = [
        'firstname', 'lastname', 'uuid',
        'email', 'phone',
        'department_id', 'designation_id', 'company', 'avatar',
    ];

    0 references | 0 overrides
    public function department(){
        return $this->belongsTo(Department::class);
    }

    0 references | 0 overrides
    public function designation(){
        return $this->belongsTo(Designation::class);
    }
}
```

Figure 92: Employee model code

Attendance setting code

```

public function updateAttendance(Request $request, AttendanceSettings $settings){
    $this->validate($request,[
        'checkin' => 'required',
        'checkout' => 'required'
    ]);
    $settings->checkin_time = $request->checkin;
    $settings->checkout_time = $request->checkout;
    $settings->save();
    $notification = notify('attendance settings updated');
    return back()->with($notification);
}

1 reference | 0 overrides
public function company(CompanySettings $settings){
    $title = 'company settings';
    return view('backend.settings.company',compact(
        'title','settings'
));
}

```

Figure 93: Attendance setting code

Employee database migration code

```

public function up()
{
    Schema::create('employees', function (Blueprint $table) {
        $table->id();
        $table->string('firstname');
        $table->string('lastname');
        $table->string('email');
        $table->string('phone')->nullable();
        $table->foreignId('department_id')->nullable()->constrained();
        $table->foreignId('designation_id')->nullable()->constrained();
        $table->string('company')->nullable();
        $table->string('avatar')->nullable();
        $table->softDeletes();
        $table->timestamps();
    });
}

/**
 * Reverse the migrations.
 *
 * @return void
 */
0 references | 0 overrides
public function down()
{
    Schema::dropIfExists('employees');
}

```

Figure 94: Migration file code

CHAPTER 8 - Testing & Verification

Testing and verification are crucial phases in software development, aiming to detect bugs and ensure the software meets user expectations. Thorough testing detects issues early, allowing timely resolution before deployment. Various validation methods assess the software against user requirements, ensuring its suitability and reliability. While bug detection is important, testing's primary goal is to validate functionality and reliability. It encompasses verification, validation, and reliability estimation, often conducted in a controlled environment. A comprehensive test plan outlines objectives, scope, and procedures, facilitating thorough evaluation. Meticulous testing ensures high-quality software, addressing issues before client deployment.

8.1 Test Plan

The HRMS test plan serves as a comprehensive guide outlining the strategy and procedures for testing the HR management system. It encompasses various aspects, including the objectives, scope, resources, and schedule for testing activities. The plan details the different types of testing to be conducted, such as functional testing, usability testing, performance testing, and security testing, to ensure comprehensive coverage. It outlines the test environment setup, including hardware, software, and data requirements, to facilitate effective testing. The test plan also includes criteria for success, test scenarios, test cases, and expected outcomes to guide the testing process and ensure thorough evaluation of the HRMS functionality and reliability.

Table 4: Test plan

Test No	Test Plan Description	Date	Purpose	Test Expectation	Tester
01	Open the login page	02.05.2024	Just check the system and server are working properly.	Go to the login page.	S. Sajipragas
02	Login validation	02.05.2024	Testing the login validation system and password matching process	Get an error message then login form cleared.	S. Sajipragas

Online Human Resources Management System

S. Sajipragas

03	Login to the application	02.05.2024	Check login system function	Redirect to dashboard page.	S. Sajipragas
04	Change password	02.05.2024	Test the password change function are working without any errors.	A notification, then the page redirect to login page.	S. Sajipragas
05	Input validation	02.05.2024	Test systems validation mechanisms.	Shows error that have validation error.	S. Sajipragas
06	Search Employee details	02.05.2024	Check the search algorithm works and given applicable results.	List all the result that liked with given input.	S. Sajipragas
07	Add new employee	02.05.2024	Add a new record into the database	Successfully added message, get a new employee card inside the all employee list.	S. Sajipragas
08	Update the holiday	02.05.2024	Verify the update function are working without any error.	A success message and the specific field get update.	S. Sajipragas
09	Delete a department	02.05.2024	Check the delete function works correctly on the system.	Ask for confirmation of the action then selected record removes from the list and the show delete successfully message.	S. Sajipragas

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10	Email validation	02.05.2024	Verify the email address.	Show the message for invalid email address.	S. Sajipragas
11	Update profile	02.05.2024	Check the profile update function is working without any errors.	A success message and the specific field get update.	S. Sajipragas
12	No of Password characters.	02.05.2024	Check the no of password characters less than 5 characters.	Show the error message, password must have more than 5 characters.	S. Sajipragas
13	Check the Logout function.	02.05.2024	Check the logout function	Logout successfully and redirect the login page	S. Sajipragas
14	Check the Report export function.	02.05.2024	Check the report export function	PDF or Excel Exported Successfully.	S. Sajipragas

8.2 Test Cases

Table 5: Test case 1

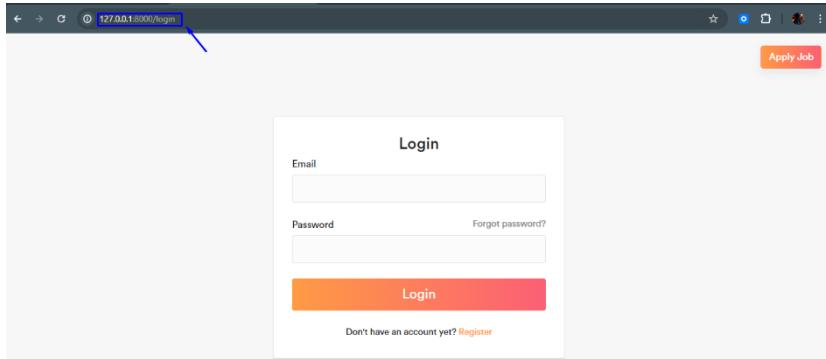
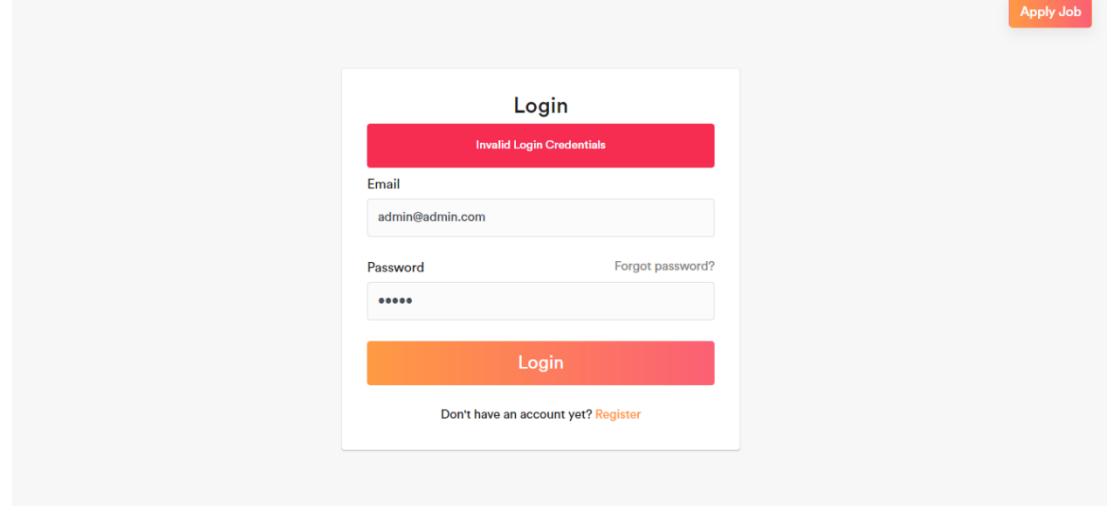
Test Case 01	
Test Description	Login validation
Test Purpose	Just check the system and server are working properly.
Method	Navigate to the login URL
Test Data	http://127.0.0.1:8000/login
Expected outcome	Go to login page
Actual output	Go to login page
Test Status	Pass
Remarks	The system works excellent.
Evidence	
	

Table 6: Test case 2

Test Case 02	
Test Description	Open the login page
Test Purpose	Testing the login validation system and password matching process.
Method	Enter wrong username or password and try to login
Test Data	User email: "admin@admin.com", Password: "1111"
Expected outcome	Get an error message then login form cleared.
Actual output	Shown an error notification and clear the login form for new login.
Test Status	Pass
Remarks	Login system works securely

Evidence


The screenshot shows a login page with the following details:

- Header:** A red button labeled "Apply Job" is visible in the top right corner.
- Title:** The page title is "Login".
- Error Message:** A red box at the top center displays the text "Invalid Login Credentials".
- Email Input:** An input field labeled "Email" contains the value "admin@admin.com".
- Password Input:** An input field labeled "Password" contains the value "*****". To its right is a link "Forgot password?".
- Login Button:** A large orange button labeled "Login" is centered below the inputs.
- Registration Link:** At the bottom left, there is a link "Don't have an account yet? Register".

Table 7: Test case 3

Test Case 03	
Test Description	Login to the application
Test Purpose	Check login system functions.
Method	Log in into the system by using login credentials.
Test Data	User email: "saji@admin.com", Password: "admin"
Expected outcome	Redirect to dashboard page
Actual output	Redirect to the home page after the login success.
Test Status	Pass
Remarks	Login and its validation system work correctly.

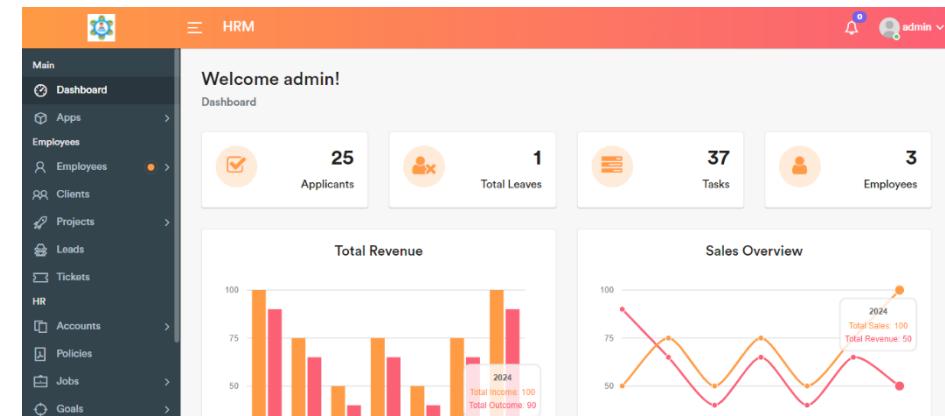
Evidence


Table 8: Test case 4

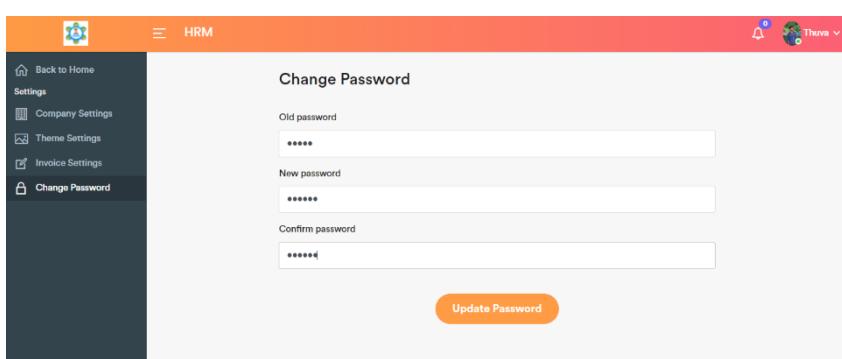
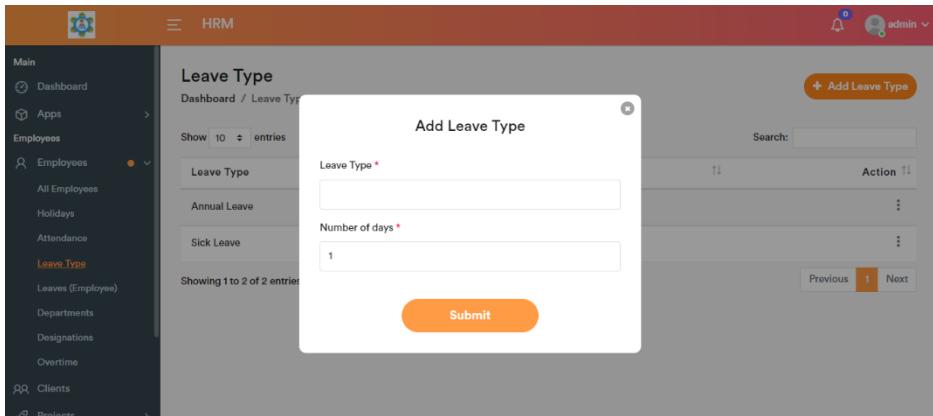
Test Case 04	
Test Description	Change password
Test Purpose	Test the password reset function are working without any errors
Method	Go to reset password page, then reset password with needed details.
Test Data	Old password: "saji1", New password: "saji2"
Expected outcome	A notification, then the page redirect to login page.
Actual output	Get a success notification and the page automatically redirect to login after the process success
Test Status	Pass
Remarks	Password reset option works fine
Evidence	
 	

Table 9: Test case 5

Test Case 05	
Test Description	Input validation
Test Purpose	Test systems validation mechanisms.
Method	Show error message
Test Data	Leave type = “ ”, Number of days = “1”
Expected outcome	Shows error that have validation error.
Actual output	Shows error that have validation error.
Test Status	Pass
Remarks	Error message works fine.

Evidence

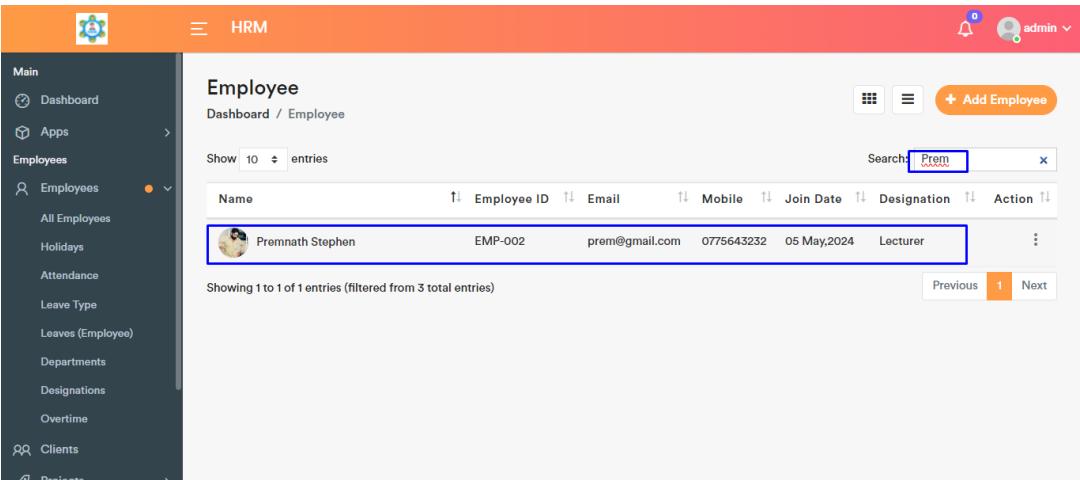


Leave Type	Leave Days	Action
Annual Leave	14 days	⋮
Sick Leave	5 days	⋮

Table 10: Test case 6

Test Case 06	
Test Description	Search Employee details
Test Purpose	Check the search algorithm works and given applicable results.
Method	Search an employee by using part of their name.
Test Data	“Prem”
Expected outcome	List all the result that liked with given input.
Actual output	Its list an employee result that match the given query.
Test Status	Pass
Remarks	Search algorithm works excellent with given query, and the result is much perfect.

Evidence



The screenshot shows the HRM application interface. The top navigation bar is orange with the title 'HRM'. On the right, there are user icons for 'admin' and a notification bell. The left sidebar has a dark theme with white text and icons. It includes sections for Main (Dashboard, Apps), Employees (Employees, All Employees, Holidays, Attendance, Leave Type, Leaves (Employee), Departments, Designations, Overtime), Clients, and Projects. The main content area is titled 'Employee' and shows a table of employees under the heading 'Dashboard / Employee'. The table has columns for Name, Employee ID, Email, Mobile, Join Date, Designation, and Action. A search bar at the top of the table contains the text 'Prem'. One row in the table is highlighted for 'Premnath Stephen' with details: EMP-002, prem@gmail.com, 0775643232, 05 May, 2024, Lecturer. At the bottom of the table, it says 'Showing 1 to 1 of 1 entries (filtered from 3 total entries)'.

Table 11: Test case 7

Test Case 07	
Test Description	Add new employee.
Test Purpose	Add a new record into the database.
Method	Add a new employee record with required information.
Test Data	First Name = “Suthakaran”, Last Name = “Sajipragas”, Email = “saji@gmail.com”, Phone = “0776898758”, Company = “Esoft”, Department = “IT”, Designations = “Lecturer”, Employee picture = “saji.jpeg”
Expected outcome	Get a new employee card and table view inside the all-employee list.
Actual output	The all-employee list shown newly added record.
Test Status	Pass
Remarks	Add functions are working properly on this application.

Evidence

The screenshot shows the 'Add Employee' interface. The form contains the following data:

First Name *	Suthakaran	Last Name	Sajipragas
Email *	saji@gmail.com	Phone	0776898758
Company	Esoft	Department *	IT
Designation *	Lecturer	Employee Picture*	Choose File WhatsApp Ima... 0.55.40 PM.jpeg

The screenshot shows the 'Employee' list page. A success message 'Success! Employee has been added' is displayed. The table lists the following employees:

Name	Employee ID	Email	Mobile	Join Date	Designation	Action
hariharaganapathy Ganapathypillai	EMP-001	hari@gmail.com	0774543234	05 May,2024	Lecturer	⋮
Premnath Stephen	EMP-002	prem@gmail.com	0775643232	05 May,2024	Lecturer	⋮
Harihara Ganapathy	EMP-003	hari@gmail.com	0774543234	05 May,2024	Lecturer	⋮
Suthakaran Sajipragas	EMP-004	saji@gmail.com	0776898758	05 May,2024	Lecturer	⋮

Table 12: Test case 8

Test Case 08	
Test Description	Update the holiday
Test Purpose	Verify the update function are working without any error.
Method	Update a holiday name number.
Test Data	Holiday name = “Vesak”
Expected outcome	A success message and the specific field get update.
Actual output	A notification message indicated the update action.
Test Status	Pass.
Remarks	Update function works fine.

Evidence

The screenshot shows the 'Edit Holiday' dialog box. The 'Holiday Name' field is filled with 'Vesak'. The 'Holiday Date' field shows '2024-05-03'. An orange 'Save' button is visible at the bottom of the dialog.

The screenshot shows a success message 'Success! Holiday has been updated successfully!!' above a table of holidays. The table lists three entries: Poya (12 Oct 2023), Navarathri (26 Oct 2023), and Vesak (03 May 2024).

Table 13: Rest case 9

Test Case 09	
Test Description	Delete a department
Test Purpose	Check the delete function works correctly on the system.
Method	Confirmation messages appear, Record removed from the list and a notification message appear on the top.
Test Data	
Expected outcome	Ask for confirmation of the action then selected record removes from the list and the show delete successfully message.
Actual output	Ask for confirmation of the action then selected record removes from the list and the show delete successfully message.
Test Status	Pass
Remarks	Delete functions works correctly.

Evidence

The figure consists of three vertically stacked screenshots of a web-based Human Resources Management (HRM) system. All three screenshots have a dark-themed header bar with the title 'HRM' and a user profile for 'admin'. The left sidebar contains navigation links for Main, Dashboard, Apps, Employees (with sub-links: All Employees, Holidays, Attendance, Leave Type, Leaves (Employee)), Departments (with sub-links: Designations, Overtime), Clients, and Projects.

Screenshot 1: Shows the 'Department' list page. The table displays five entries: 1. IT, 2. BM, 3. Development, 4. Quality Assurance (QA), and 5. eee. The entry 'eee' is highlighted with a blue selection bar at the bottom of the list.

Screenshot 2: Shows the same 'Department' list page, but with a modal dialog box titled 'Delete Department' overlaid. The dialog asks 'Are you sure want to delete?' with 'Delete' and 'Cancel' buttons. The entry 'eee' is still visible in the background list.

Screenshot 3: Shows the 'Department' list page again, but now with a green success message at the top stating 'Success! Holiday has been deleted successfully!'. The table shows four entries: 1. IT, 2. BM, 3. Development, and 4. Quality Assurance (QA).

Table 14: Test case 10

Test Case 10	
Test Description	Email validation.
Test Purpose	Verify the email address.
Method	Show the message for invalid email address
Test Data	Enter the invalid email address.
Expected outcome	Show the message for invalid email address.
Actual output	Show the message for invalid email address.
Test Status	Pass.
Remarks	Email validation message works fine.

Evidence

The screenshot shows the 'Add Employee' form in a web application. The 'Email' field contains the value 'hari'. The 'First Name' field is 'Hari' and the 'Last Name' field is 'Ganapathy'. The 'Phone' field is '0774543232'. The 'Company' field is 'Esoft' and the 'Department' field is 'IT'. The 'Designation' field is 'Lecturer'. A file input field for 'Employee Picture' has the placeholder 'Choose File chat.openai.co...4ff0fed4a2b.png'. The 'Submit' button is at the bottom right. The background shows a sidebar with various HR management options like Dashboard, Apps, Employees, Holidays, Attendance, etc.

This screenshot is identical to the one above, but it includes a validation message: 'Please include an '@' in the email address: 'hari' is missing an '@'. This message appears in a red box below the 'Email' field. All other fields and the overall interface are the same as the first screenshot.

Table 15: Test case 11

Test Case 11	
Test Description	Update profile.
Test Purpose	Check the profile update function is working without any errors.
Method	Show the message for profile update successfully.
Test Data	Full Name = “Thuvaragan”
Expected outcome	A success message and the specific field get update.
Actual output	A success message and the specific field get update.
Test Status	Pass.
Remarks	Profile update function works fine.

Evidence

Table 16: Test case 12

Test Case 12	
Test Description	No of Password characters.
Test Purpose	Check the no of password characters less than 5 characters.
Method	Show the error message for password reset successfully
Test Data	Old password = “saji1”, New password = “saji”, Confirm password = “saji”
Expected outcome	Show the error message, password must have more than 5 characters.
Actual output	Show the error message, password must have more than 5 characters.
Test Status	Pass.
Remarks	Password validation function works fine.

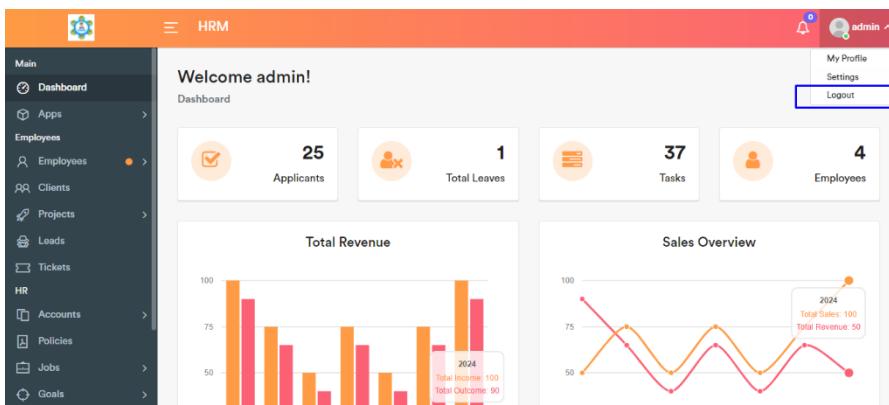
Evidence

The screenshot shows the 'Change Password' page of the HRM system. The sidebar menu includes 'Back to Home', 'Settings', 'Company Settings', 'Theme Settings', 'Invoice Settings', and 'Change Password'. The 'Change Password' option is selected. The main form has fields for 'Old password', 'New password', and 'Confirm password', each containing five asterisks. An orange 'Update Password' button is at the bottom.

The screenshot shows the 'Change Password' page after an attempt to update the password. The error message 'Error! Password must have more than 5 characters.' is displayed in a red box above the input fields. The sidebar and other page elements are identical to the first screenshot.

Table 17: Test case 13

Test Case 13	
Test Description	Check the Logout function.
Test Purpose	Check the logout function.
Method	Redirect the login page
Test Data	Click the logout page.
Expected outcome	Logout successfully and redirect the login page.
Actual output	Logout successfully and redirect the login page.
Test Status	Pass.
Remarks	Logout function works properly.

Evidence


The screenshot shows the HRM system's main dashboard. On the right side, there is a user profile section with a bell icon, the name 'admin', and a dropdown arrow. Below this, there are four summary cards: 'Applicants' (25), 'Total Leaves' (1), 'Tasks' (37), and 'Employees' (4). At the bottom right of the dashboard area, there is a red 'Logout' button with a blue outline. A large, semi-transparent modal window is overlaid on the dashboard, covering most of the central and lower areas. This modal is titled 'Login' and contains fields for 'Email' and 'Password', along with a 'Forgot password?' link and a large red 'Login' button. At the bottom of the modal, there is a link 'Don't have an account yet? [Register](#)'. The overall interface has a modern design with orange and grey colors.

Table 18: Test Case 14

Test Case 14	
Test Description	Check the Report Export function.
Test Purpose	Check the Report Export function.
Method	Export the PDF and Excel
Test Data	Click the Export Button.
Expected outcome	PDF or Excel Exported Successfully.
Actual output	PDF or Excel Exported Successfully.
Test Status	Pass.
Remarks	Report Export function works properly.

Evidence

Employee	Leave Type	From	To	Reason	Status
Hariharan Ganapathy	Medical Leave	2024-06-19	2024-06-18	sick	Declined
hariharaganapathy Ganapathypillai	Sick Leave	2023-10-02	2023-10-04	Sick Leave	Approved
Thuvargan Sutha	Sick Leave	2024-03-11	2024-03-15	Sick	Pending

Employee	Leave Type	From	To	Reason	Status
hariharaganapathy Ganapathypillai	Sick Leave	2023-10-02	2023-10-04	Sick	Approved
Thuvargan Sutha	Sick Leave	2024-03-11	2024-03-15	Sick	Pending
Hariharan Ganapathy	Medical Leave	2024-06-19	2024-06-18	sick	Declined

8.3 Testing Results

This summary outlines the results of the testing phase for the HRMS project, indicating the team's confidence in the system's readiness for implementation. The testing involved thorough examination of different aspects of the HRMS to ensure functionality as intended, aiming to identify any issues or discrepancies. Through rigorous testing of key features like employee management and leave tracking, the team confirmed adherence to initial project requirements. The testing process aligned closely with client expectations to ensure the HRMS effectively supports their HR operations. Positive test results validate the system's development and design, affirming its ability to streamline processes and enhance organizational performance. This statement assures that the HRMS has undergone comprehensive testing and is primed for deployment, instilling confidence in its reliability and effectiveness.

CHAPTER 9 - Conclusions & Future Work

The development of this human resource management system leverages a mix of modern web technologies like Laravel, MySQL, CSS, HTML, JavaScript, AJAX, jQuery, and Socket.io for real-time notifications, resulting in a comprehensive solution catering to diverse HR needs. Through automation, the system significantly boosts the efficiency of HR operations by simplifying tasks such as tracking employee attendance, shift management, generating reports, and managing job descriptions.

An advantage of this HRMS lies in its ability to offer valuable insights through data visualization, empowering HR managers to make strategic decisions with features like absenteeism reports and organizational charts. This fosters informed decisions on resource allocation and workforce management. The HRMS promotes equality in job opportunities and benefits by facilitating applicant tracking, analyzing workforce utilization, and supporting career planning. It enables organizations to identify talent gaps, make informed hiring choices, and foster employee growth through training and advancement opportunities. The system's automation capabilities extend to critical functions such as payroll processing, leave management, and compliance reporting, saving time for HR personnel while ensuring accuracy and regulatory compliance.

The HRMS serves as a central repository for employee records, training histories, and performance evaluations, enabling efficient data management, progress tracking, and workforce forecasting. It also streamlines communication with government agencies by generating necessary reports and ensuring adherence to regulatory standards.

9.1 Further Work & Limitations

In the development of the human resource management system, developer has achieved significant milestones and implemented essential features to meet the requirements outlined in the project scope. However, there are areas for further improvement and considerations for future development to enhance the system's functionality, usability, and overall effectiveness.

Limitations

1. Due to time and resource limitations, certain features and functionalities were prioritized over others, resulting in some aspects of the system being less comprehensive or refined than desired.
2. While the current technology stack comprising Laravel, MySQL, CSS, HTML, JavaScript, AJAX, jQuery, and Socket.io has served us well, it may have limitations in scalability, performance, or compatibility with future requirements.
3. Limited user feedback during the development phase may result in overlooking specific user needs or preferences, which could impact user satisfaction and adoption rates.
4. Ensuring accessibility compliance for users with disabilities may pose challenges, particularly in designing and implementing accessible user interfaces and functionalities.

Further Work

1. Expand the feature set of the human resource management system to include additional modules such as payroll management, recruitment and hiring, talent retention, performance evaluation, and employee engagement.
2. opportunities to modernize the technology stack, optimize performance, and refactor codebase to improve scalability, maintainability, and overall system efficiency.
3. Focus on enhancing the user experience by redesigning the user interface, implementing intuitive navigation, and incorporating interactive elements to improve usability and engagement.

4. Implement robust security measures such as multi-factor authentication, role-based access control, data encryption, and regular security audits to mitigate potential security risks and safeguard sensitive data.
5. Introduce internationalization and localization features to support users from diverse regions and languages, making the system accessible and user-friendly on a global scale.
6. Try to add AI-related technologies for complex data analysis and to generate prediction reports
7. Establish processes for continuous improvement, including gathering user feedback, conducting usability testing, and prioritizing feature enhancements based on user needs and industry trends.
8. Implementing APIs with advanced security protocols to safeguard sensitive information.

These are some tasks developer aim to implement in the project in the future to enhance the application's functionality. Developer plan to execute these tasks following the software development lifecycle, utilizing the Agile scrum framework. This framework comprises defined events, time constraints, a meticulously prioritized Product Backlog, and regular feedback loops. The development process will encompass stages such as design, planning, coding, and more. Subsequently, thorough testing, including both black-box and white-box testing, will ensure that the application meets the customer's requirements and delivers appropriate outcomes. Upon completion of testing across all components, the project will be prepared for finalization and deployment for operational use.

9.2 Bottom Line

In bottom line, employees are vital assets for any organization, and effective management is crucial for achieving business goals. Human resource teams oversee critical functions like recruitment, benefits administration, training, and development strategies. Leveraging a computer-based human resource management system offers significant benefits, streamlining processes such as screening, tracking, and reporting on job-related tasks.

The adoption of a human resource management system enables organizations to centralize and automate HR functions, enhancing departmental efficiency and contributing to overall organizational success. As the HRMS market continues to grow, it's crucial to assess development stages and suitability for different organizational sizes.

After thorough research, design, planning, development, and testing, our human resource management system now delivers comprehensive insights and tracking capabilities for various HR activities. Ultimately, implementing a human resource management system is not just an option; it's essential for organizations seeking cost reduction, efficiency improvement, and competitiveness in today's technology-driven business landscape.

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Client request letter for a human resource management system development

SJ SOLUTIONS

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To Mr. Sajipragas

Dear Sir,

REQUEST TO DEVELOP AN ONLINE HUMAN RESOURCE MANAGEMENT SYSTEM

I am Rajakaran Thuvaragan, the manager of SJ Solutions, located in Jaffna. Over the past three years, our company has been actively involved in Software development process. Currently, our business operations are managed manually, but I am eager to adapt to the evolving technological landscape and transition to online platforms.

Given the dynamic changes in market trends, customer preferences, and strategic dynamics, I believe it is imperative for our company to embrace online solutions to stay competitive and meet the demands of our customers effectively. To this end, I am seeking your assistance in developing an Online Human Resource Management System (HRMS) to streamline our business operations and enhance efficiency.

As our business operates within a limited market, we do not require an online payment gateway at this stage. Therefore, I request the development of the HRMS with a cash-on-hand mode feature to manage employee payments and benefits effectively.

I would appreciate it if the website design incorporates professional colors and features that are user-friendly to ensure a seamless user experience.

I kindly request that you develop the Online Human Resource Management System based on the outlined requirements and submit it at your earliest convenience.

Thank you for considering my request. I look forward to your prompt response and the successful development of the HRMS for SJ Solutions.

Kind Regards,

R.T. Thuvaragan

SJ Solutions

Thank you.

Figure 95: Client request letter for a human resource management system development