International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 04 | April - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

# HUMAN RESOURCE MANAGEMENT SYSTEM(HRMS)

**Madhav Sandeep Lonkar*[1], Aditi Jaypal Umare*[2], Gururaj Sambhaji Yadav*[3], Nandkumar Sambhaji Chavan*[4], P.V. Kulkarni *[5].**

[1,2,3,4]Student, Computer Engineering, Sinhgad Academy of Engineering, Kondhwa, Pune, Maharashtra, India. [5]Professor, Department of Computer Engineering, Sinhgad Academy of Engineering, Kondhwa, Pune, Maharashtra, India.

---

**Abstract -** In today's fast-paced business environment, the effective management of human resources stands as a cornerstone for organizational excellence and competitiveness. This project is dedicated to introducing a state-of-the-art Human Resource Management System (HRMS) designed to modernize conventional HR practices and streamline operations through technological innovation.

The primary goal of this endeavor is to amalgamate and revamp diverse HR functions, encompassing employee records management, payroll processing, leave administration, and recruitment. Through the utilization of automation and digitalization, the project endeavors to alleviate administrative burdens, mitigate errors, and elevate overall HR efficacy.

***Key Words*:** MySQL ,Thymeleaf, Spring Boot, CI/CD , Data Security

## 1.INTRODUCTION

In today's rapidly evolving business landscape, agility and innovation are key to staying ahead. Recognizing the pivotal role of effective human resource management, our organization is embarking on a transformative journey towards implementing a state-of-the-art Human Resource Management System (HRMS). This strategic initiative leverages advanced technology to revolutionize traditional HR practices, driving efficiency and productivity. By integrating various HR functions, including employee records management, payroll processing, leave management, and recruitment, our aim is to create a seamless and unified system that streamlines operations and enhances decision-making processes.

Through automation and digitalization, the HRMS project seeks to alleviate administrative burdens, reduce errors, and optimize resource allocation. Crucially, data security and privacy remain paramount considerations, ensuring the confidentiality and compliance of sensitive employee information with stringent data protection regulations. At the core of our approach is a commitment to user-centric design, with an intuitive interface tailored to enhance the experience for HR personnel and employees alike.

## 2. System Architecture

The system architecture of our HRMS (Human Resource Management System) is designed to provide a robust, scalable, and secure platform for managing all aspects of HR operations within our project. At its core, the architecture follows a multi-tiered approach, consisting of client-side and server-side components, each serving distinct roles in the system's functionality. This client-side application communicates with the server-side components hosted on our application server, where the business logic is implemented. Our server-side architecture is designed to handle incoming requests from clients, process data, and interact with the database system. Speaking of the database architecture, we utilize a relational database management system (RDBMS) to store and manage employee data, payroll information, and other HR-related records. The database schema is carefully designed to optimize data storage, retrieval, and querying operations. Furthermore, our system architecture incorporates robust security measures to protect sensitive HR data. This includes implementing authentication mechanisms, access controls, and data encryption techniques to safeguard against unauthorized access and security threats. Additionally, we have deployed the HRMS using a scalable deployment architecture, allowing for seamless deployment across different environments and ensuring high availability and reliability of the system. Overall, our system architecture is carefully designed to meet the functional requirements of our HRMS while prioritizing performance, scalability, and security.

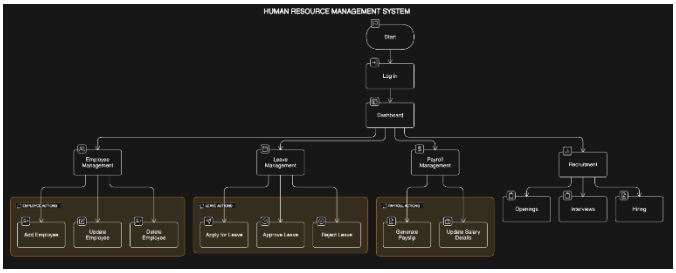



**Fig -1**: HRMS ARCHITECTURE

## 3.Existing System

**1.Data Management:** Existing HRMS solutions often struggle with efficiently handling large volumes of data. This can lead to potential data inconsistencies and inaccuracies, undermining the reliability of HR data for decision-making processes.

**2.User Experience:** Many existing systems suffer from outdated user interfaces, resulting in poor user experience and decreased user adoption rates.

**3.Real-time Reporting and Analytics:** Limited capabilities in real-time reporting and analytics can hinder organizations' ability to derive actionable insights from HR data promptly.

**4.Integration Challenges:** Existing HRMS solutions may face challenges in seamlessly integrating with other enterprise systems, such as payroll, finance, and CRM systems. Integration complexities can result in data silos, inefficient processes, and increased administrative overhead.

**5.Limited Customization:** Some existing systems may offer limited customization options, making it challenging for organizations to tailor the system to their unique requirements and workflows. Lack of flexibility can hinder user adoption and inhibit system optimization.

## 4.Implementation

**A) Login Module:**

**User Authentication Methods**: Analyze the effectiveness and security of various authentication methods such as basic username and password, 2FA (Email Based OTP Verification), and consider the best practices for implementing them.

**Security Measures**: Detail the security measures implemented, such as hashed passwords using Bcrypt, protection from brute force attacks.

**User Access Control**: Analyze the requirements for user roles and permissions management, including defining roles, assigning permissions, and ensuring access control based on user roles.

**B) Attendance Module:**

**Leave Management**: Analyze the requirements for managing various types of leave (e.g., vacation, sick leave, maternity/paternity leave), including leave accrual, request submission, approval workflows, and leave balance tracking.

**Workday Management**: Detail the functionality for recording employee workdays, including clock-in/out, attendance tracking, and timesheet management.

**Holiday Management**: Discuss the functionality for managing holidays, including defining holiday schedules, automatically adjusting employee schedules, and ensuring compliance with labor laws and company policies.

**Integration with Other Modules**: Identify integration points with other modules (e.g., payroll, recruitment) to ensure seamless data exchange and consistency across the HRMS.

**C) Recruitment Module:**

**Job Posting and Applicant Tracking**: Analyze the requirements for creating and publishing job postings, managing applications, screening candidates, and tracking the recruitment process from job posting to hiring.

**Candidate Management**: Discuss features for managing candidate profiles, including resume/CV storage, candidate communication, interview scheduling, and feedback management.

**Integration with HRIS**: Analyze integration requirements with the HR Information System (HRIS) to ensure seamless transfer of candidate data to employee records upon hiring.

**D) Payroll Module:**

**Salary Management**: Analyze requirements for managing employee salaries, including salary structures, deductions, bonuses, and allowances.

**Payroll Processing**: Discuss features for automating payroll calculations and generating pay slips and payroll reports.

**Integration with Attendance and HRIS**: Identify integration points with the attendance module for accurate payroll calculations based on attendance records and with the HRIS for updating employee payroll information.

## 5.Algorithms

**BCrypt:** BCrypt is a cryptographic hashing function primarily used for password hashing in software applications. It employs a combination of salt generation and key stretching techniques to enhance password security.

**Scoring Algorithm:** A scoring algorithm is a computational method that evaluates items based on predefined criteria. It takes input parameters, defines criteria, processes data, calculates scores, ranks items, and generates output.

**Google WebKit Library:** The Google WebKit Library is a collection of open-source software tools and resources developed by Google to facilitate web development and browser functionality. It includes libraries, APIs, and tools that developers can utilize to create web applications, enhance browser capabilities, and optimize web performance.

**AWS Amazon Polly :**Amazon Polly, part of Amazon Web Services (AWS), is a text-to-speech (TTS) service that converts written text into natural-sounding speech. It utilizes advanced

deep learning technologies to synthesize lifelike speech from input text in various languages and voices.

**Session Validators:** Session validators are mechanisms used in web applications to verify the authenticity and integrity of user sessions. They help ensure that each session established between a user and the application remains secure and valid throughout the user's interaction.

## 6.Methodology

**Usability Focus**: The user interface and overall design are crafted with usability in mind. This includes intuitive navigation, clear layout, and concise user interactions, ensuring that users can easily understand and navigate the software without extensive training.

**Scalability and Performance**: The architecture is built to handle large volumes of data and process multiple queries efficiently. This scalability is achieved through careful design and optimization, allowing the software to maintain performance even under heavy loads.

**Continuous Integration and Continuous Deployment (CI/CD)**: CI/CD practices are implemented effectively to streamline the development, testing, and deployment processes. This ensures rapid delivery of updates and improvements to the software, reducing query times and enhancing overall efficiency.

**Agile Development**: Agile methodologies are embraced to foster collaboration, adaptability, and responsiveness throughout the development lifecycle. This iterative approach allows for continuous improvement and enables the software to evolve in alignment with user needs and market demands.

**DFD(Data Flow Diagram):**

It is a graphical representation of the flow of data within a system, illustrating how data moves between processes, data stores, and external entities.

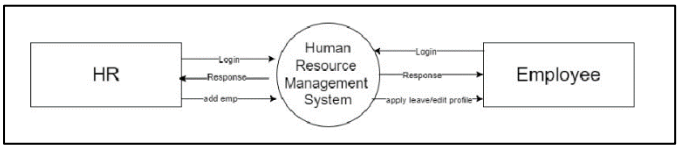



**Fig -2**: Data Flow Of Process 1

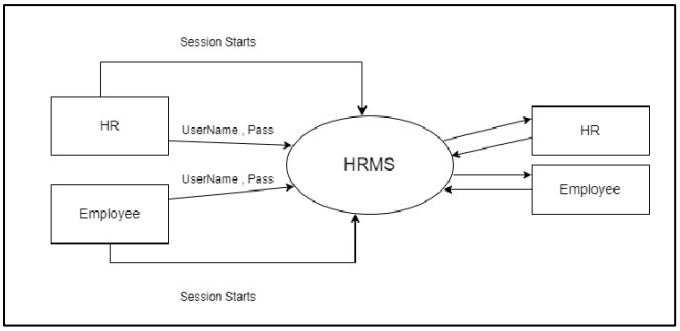



**Fig -3**: Data Flow Of Process 2

## 7.Software And Hardware Requirements

**Software Requirements for Developers:**

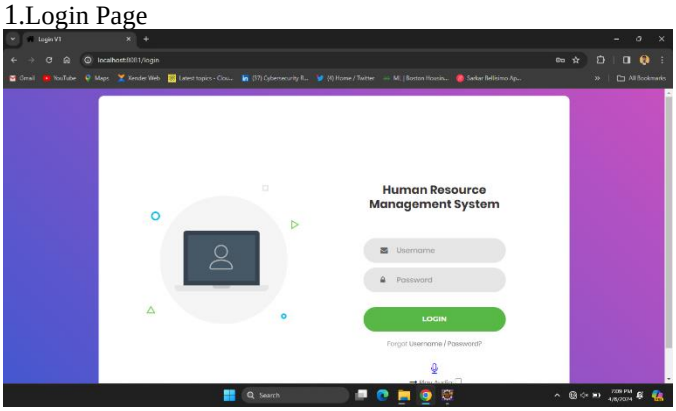
1. Integrated Development Environment (IDE) - Software like IntelliJ IDEA, Eclipse, or Visual Studio Code for coding and development.
2. Version Control System - Git for tracking code changes and collaboration.
3. Database Management System - MySQL or a similar DBMS for local development and testing.
4. Web Server - Apache Tomcat or another web server for deploying and testing the application locally.
5. Continuous Integration/Continuous Deployment (CI/CD) Tools - CI/CD platforms like Jenkins, Travis CI, or Git CI/CD for automating the build and deployment process.
6. Thymeleaf and Spring Boot - Development libraries and frameworks for front-end and back-end development.

**Hardware Requirements for Developers:**

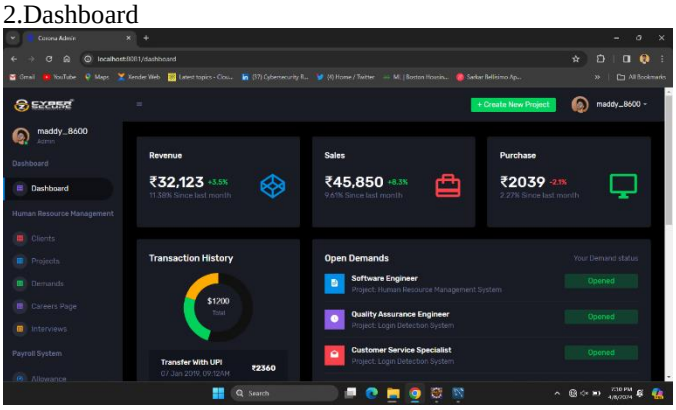
1. Computer - A developer's workstation, which can be a desktop or laptop.
2. Internet Connection - A stable internet connection for accessing online resources, collaborating, and deploying to remote servers.
3. Storage - Adequate storage space for storing code, libraries, and project files.
4. Adequate RAM - Sufficient memory to run development tools and test the application effectively.

## 8.Results

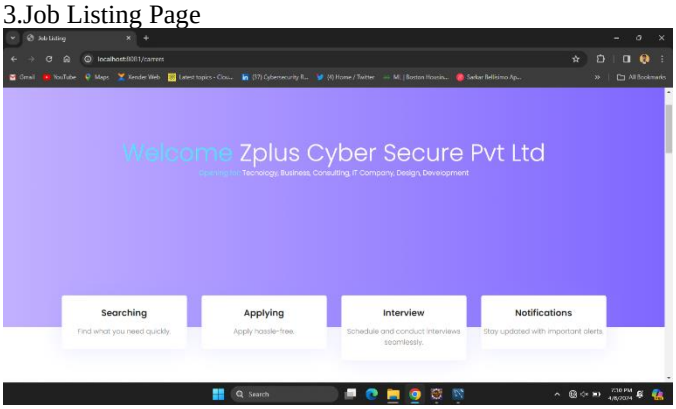
1.Login Page



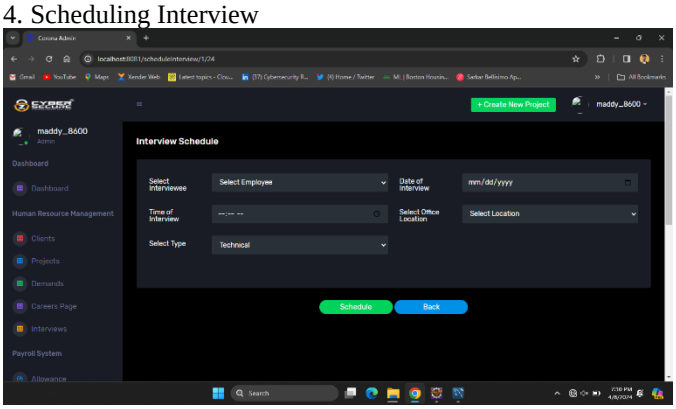
2.Dashboard



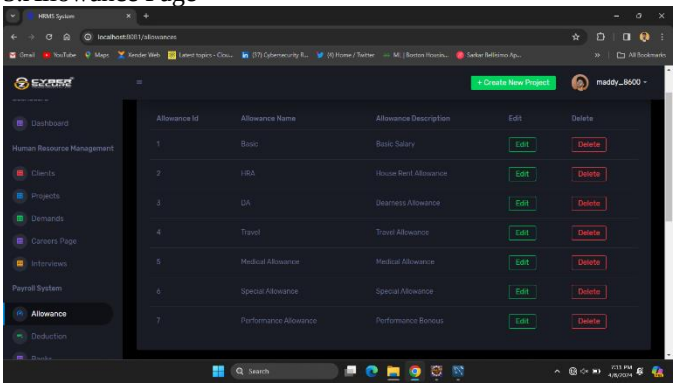

3.Job Listing Page



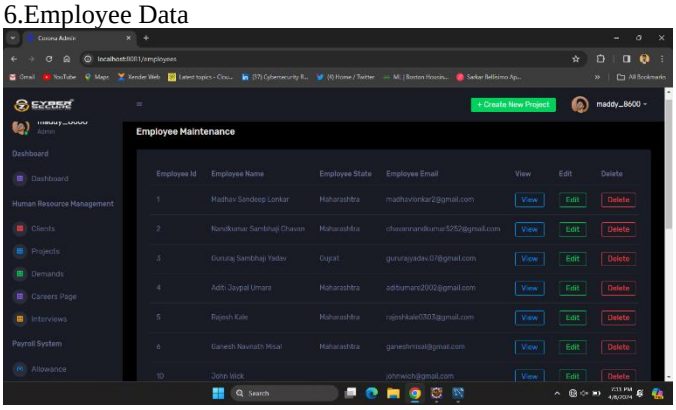

4. Scheduling Interview



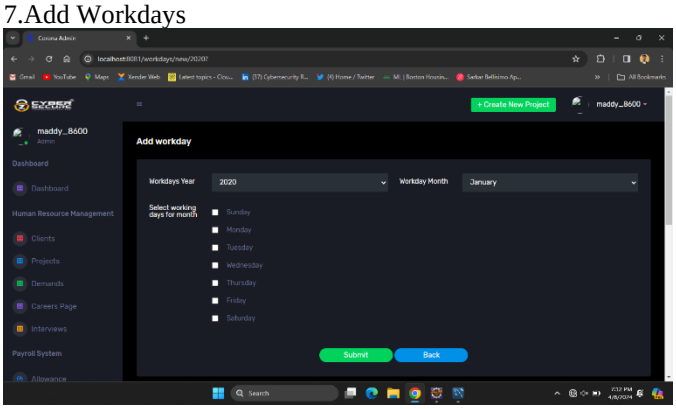

5.Allowance Page



6.Employee Data




7.Add Workdays




## 9. CONCLUSIONS

In summary, the implementation of the HRMS project's database has been successfully executed, providing a robust foundation for managing HR-related data and processes. Careful design and testing have ensured data integrity and system reliability. With this database in place, the HRMS system is equipped to efficiently handle tasks such as employee management, recruitment, payroll, and leave tracking, contributing to streamlined HR operations and organizational effectiveness. Ongoing maintenance and collaboration will ensure the database continues to meet evolving needs and remains an asset for the organization.

## 10.REFERENCES

[1]Analysis Measurement of Implementation Enterprise Resource Planning on Human Resource Management in University XYZ , ©2020 IEEE | DOI: 10.1109/ICCED51276.2020.9415764

[2]Smart Human Resource Management System to Maximize Productivity, |©2020 IEEE| DOI: 10.1109/ICS51289.2020.00100

[3] Human Resource Management System |ISSN: 2278-0661, p- ISSN: 2278-8727Volume 8, Issue 4 (Jan. - Feb. 2013), PP 62-71

[4] A Research Paper on Human Resources Planning, Process and Developing |ISSN: 2277- 3878 (Online), Volume-8 Issue-6, March 2020

[5] Human Resource Management System(HRMS)- The Effects and Organizational Performance | Volume 7 Issue-03, March 2018 |IJARSE

[6] Research of the Human Resource Management Based on the Sustainable Development of the Enterprise [7] J2EE-based Human Resources s Management Information System Design and Implementation Gui Ying, Tang bin, Gao Xiao-hui.
[8] How E-HR Optimizes the Human Resource Management Process Hong Kesen
[9]Evaluation and analysis of strategic human resource management based on multi-mode fuzzy logic control algorithm |©2020 IEEE | DOI: 10.1109/ICMCCE51767.2020.00418
[10] H. Y. Chiang, B. M. T. Lin: Decision Model for Human Resource Allocation in Project Management of Software Development | VOLUME 8, 2020