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## HUMAN RESOURCE MANAGEMENT SYSTEM

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**Abstract:** Human resource management (HRM) is the process of employing people, training them, compensating them, developing policies relating to them, and developing strategies to retain them. As a field, HRM has undergone many changes over the last twenty years, giving it an even more important role in today's organizations. In the past, HRM meant processing payroll, sending birthday gifts to employees, arranging company outings, and making sure forms were filled out correctly—in other words, more of an administrative role rather than a strategic role crucial to the success of the organization.

HRM professionals need to determine that compensation is fair, meets industry standards, and is high enough to entice people to work for the organization. Compensation includes anything the employee receives for his or her work. In addition, HRM professionals need to make sure the pay is comparable to what other people performing similar jobs are being paid. This involves setting up pay systems that take into consideration the number of years with the organization, years of experience, education, and similar aspects.

**Keywords**—HR management, Employee management, Spring Boot, Angular

### I. INTRODUCTION

#### 1.1 Human Resource Management

Human Resource Management or Personnel management is the activity of managing personnel, usually employees. In any organization, managing personnel is the process of making sure the employees (not the customers) are as productive as they can be. This can include hiring, firing, or transferring people to/from jobs they can do most productively.

This subject is a major at many universities, or a minor in the business school. It is also known as personnel administration, which is functionally an equivalent term.

#### Meaning of Human Resource Management

A business unit needs employees to look after different activities. This is called manpower or human resource. Such human resource needs to be developed fully so that it will make positive contribution for the progress and prosperity of a business unit. For this systematic development and management of human resources is necessary. Human Resource Management (HRM) deals with:

- (a) Training
- (b) Self-development
- (c) Promotions
- (d) Performance appraisal of manpower recruited in an organization.

HRM is an organized learning experience aimed at matching the organizational need for career growth and development. It is a process involving series of learning activities designed to acquire desired level of competence among employees. HRM is a continuous process and it needs money. Such investment creates a team of efficient, skilled and trained manpower which brings success and stability to a business unit. HRM programmers offer long term benefits to an organization.

## 1.2 Characteristics of Human Resource Management

### 1: Upgrading Manpower

HRM is basically concerned with the upgrading of manpower working in an organization. This leads to improvement in the individual performance of an employee and also corresponding improvement in the organizational performance.

### 2: Stress on Training

HRM includes various schemes arranged for providing education, guidance, training and opportunities to learn and develop employees of all categories and working in different departments. There is an integrated use of sub-systems (training, career developments, organizational development) in the HRM program.

### 3: Attention to learning and career development

Learning, self-development, career developments are possible through HRM programs. These are the core areas of HRM. Career development is possible through joining training courses, reading books and periodicals. Learning and career development raise the capacity of employees to work at highest levels. They are given higher positions with monetary benefits.

### 4: Organizational Development:

HRM includes organizational development, which includes effective communication within the organization, coordination of different activities elimination of conflicts of different types and creation of orderly atmosphere in the whole organization.

### 5: Team Spirit

HRM is basically for developing team spirit in the whole organization. For this, departments and levels of management are properly integrated. Team spirit facilitates orderly growth of the organization in the right direction.

### 6: Huge spending by Management:

All companies invest huge money on HRM activities but such expenditure is absolutely essential for survival in the present competitive business world. HRM programmers create matured, skilled and efficient manpower, which is a valuable asset of a business unit.

### 7: Termination of Employment:

Termination is an unpleasant part of any manager's job. Employees occasionally must be terminated for breaking rules of failing to perform adequately. Human Resource Management System

### 8: Continuous Activity:

HRM is rightly treated as a continuous activity due to new developments taking place regularly in the business world. For this, on the job and off the job training programmes are introduced from time-to-time.

9: Wide Scope: The scope of HRM programmes is very vast. It is multi-disciplinary in character. Training and guidance are given on different aspects of business management to enable managers to deal with complex managerial problems and challenges

## II. PROBLEMSTATEMENT

The problem statement of human resource management (HRM) can vary depending on the context, organization, and industry. However, a general problem statement for HRM could be:

"In today's dynamic business environment, organizations face challenges in effectively managing their human resources to achieve strategic goals, enhance employee productivity, satisfaction, and retention, and adapt to changing market conditions. These challenges include attracting and retaining top talent, fostering a diverse and inclusive workplace culture, developing effective training and development programs, ensuring compliance with labor laws and regulations, managing workforce diversity, addressing employee conflicts, and leveraging technology to streamline HR processes. Consequently, there is a critical need for innovative HRM strategies and practices to overcome these challenges and drive organizational success."

## III. LITERATUREREVIEW

In the strategic human resource (HR) management literature, over the past three decades, a shared consensus has developed that the focus should be on HR systems rather than individual HR practices because the effects of HR practices are likely to depend on the other practices within the system. Despite this agreement, the extent to which the fundamental assumption in the field of interactions and synergy in the system holds true is unclear.

We present a systematic review of 495 empirical studies on 516 HR systems in which we analyze the development of HR systems research over time and identify important trends, explicitly linking conceptualization and measurement of the HR system. Our findings suggest that the increasingly broad conceptualization and measurement of HR systems and the lack of clarity on the HR systems construct at different levels have hampered research progress.

Much of the research to date does not align with the fundamental assumption of synergies between HR practices in a system, the measures have problems and increasingly confound HR systems with related concepts and outcomes, and insufficient attention is paid to the HR system construct at different levels. Overall, we thus still know little about

the “systems” element and how synergies and interactions in an HR system operate. We offer actionable suggestions on

how to advance HR systems research towards conceptual clarity and construct refinement, focusing both on how

to conceptualize, measure, and combine practices in systems and on studying such systems at different levels of analysis.

#### IV. METHODOLOGY AND IMPLEMENTATION

##### •METHODOLOGY

The development of a Human Resource Management System (HRMS) using Java Spring Boot for the backend, Angular for the frontend, and MySQL for the database begins with a comprehensive project initiation phase. During this stage, the scope and objectives of the HRMS project are defined, key stakeholders are identified, and requirements are gathered from HR managers, employees, and other relevant parties. Additionally, project timelines, milestones, and budget are established to guide the development process effectively.

Following project initiation, the system analysis and design phase is initiated. This phase involves a thorough analysis of HR processes and workflows to understand the requirements fully. Designing the database schema to store employee information, payroll data, attendance records, and other relevant data is a crucial aspect of this phase. Wireframes and mockups are created to visualize the user interface and user experience, while the system architecture, including backend APIs and frontend components, is defined.

With the analysis and design complete, the backend development using Java Spring Boot is initiated. This involves setting up the development environment and implementing RESTful APIs to handle CRUD operations for employee management, attendance tracking, leave management, etc. Integration of Spring Security for authentication and authorization, as well as implementation of business logic for HR processes such as payroll calculations and performance evaluations, are key components of this phase. Unit testing is conducted rigorously to ensure the functionality and reliability of each module.

Simultaneously, frontend development using Angular is undertaken. The development environment for Angular is set up, and the user interface is implemented based on wireframes and mockups. Components for employee dashboards, leave requests, attendance tracking, etc., are developed, and integration with backend APIs is established using the HttpClient module. Client-side validation and error handling are implemented, and usability testing is conducted to ensure an intuitive user experience.

The database implementation phase involves designing and creating the database schema based on the system requirements. The MySQL database server is set up and configured, and the data access layer is implemented using Spring Data JPA for seamless interaction with the database. Database migrations and versioning are handled using tools like Flyway or Liquibase, while database performance is optimized through indexing and SQL query optimization.

Integration and testing follow, where the frontend and backend components are integrated to ensure seamless communication. Integration testing validates the interaction between different modules, while system testing ensures the overall functionality of the HRMS. Bugs or issues discovered during testing are identified and fixed promptly.

Finally, deployment and maintenance involve deploying the HRMS application to a production environment using tools like Docker and Kubernetes for containerization and orchestration. Monitoring and logging are set up to track application performance and detect errors, while user training and documentation are provided for HR staff and employees. A maintenance plan is established for regular updates, patches, and enhancements based on user feedback and changing requirements, ensuring the ongoing success and usability of the HRMS.

## •IMPLEMENTATION

During the implementation phase of the HRMS project, each component - backend, frontend, and database undergoes specific steps tailored to its technology stack.

For the backend development using Java Spring Boot, implementation involves creating controllers, services, and repositories. Controllers handle incoming HTTP requests and route them to appropriate service methods. Services encapsulate business logic and interact with repositories, which in turn handle database operations. Implementation also includes defining data models using JPA annotations, configuring Spring Security for authentication and authorization, and implementing exception handling and validation. Additionally, integration with third-party libraries or services may be required for functionalities like email notifications or external API integrations.

Frontend implementation with Angular focuses on building reusable components, services, and modules. Components represent UI elements such as forms, tables, or cards, while services encapsulate data manipulation or API calls. Implementation includes defining routes and navigation, handling user input with forms and event binding, and managing application state using observables. Integration with backend APIs is achieved using Angular's HttpClient module to send HTTP requests and process responses. Styling and layout are managed using CSS frameworks like Bootstrap or custom stylesheets.

For the database implementation using MySQL, the focus is on creating an efficient schema that accurately represents the data model defined during the design phase. Implementation includes creating tables, defining relationships between them using foreign keys, and adding constraints like unique keys or indexes for data integrity and performance. Additionally, database migration scripts are created to manage schema changes over time, ensuring that the database schema evolves alongside the application. Optimizations such as denormalization or partitioning may be applied to improve query performance for frequently accessed data.

Throughout the implementation phase, thorough testing is essential to ensure the quality and reliability of the HRMS application. Unit tests are written for backend service methods and frontend components to validate individual functionalities in isolation. Integration tests verify the interaction between different layers of the application, including frontend-backend communication and database operations. End-to-end tests simulate user interactions with the application to validate its behavior from a user's perspective. Automated testing frameworks like JUnit, Mockito, Protractor, or Cypress are commonly used to streamline the testing process and catch regressions early in the development cycle.



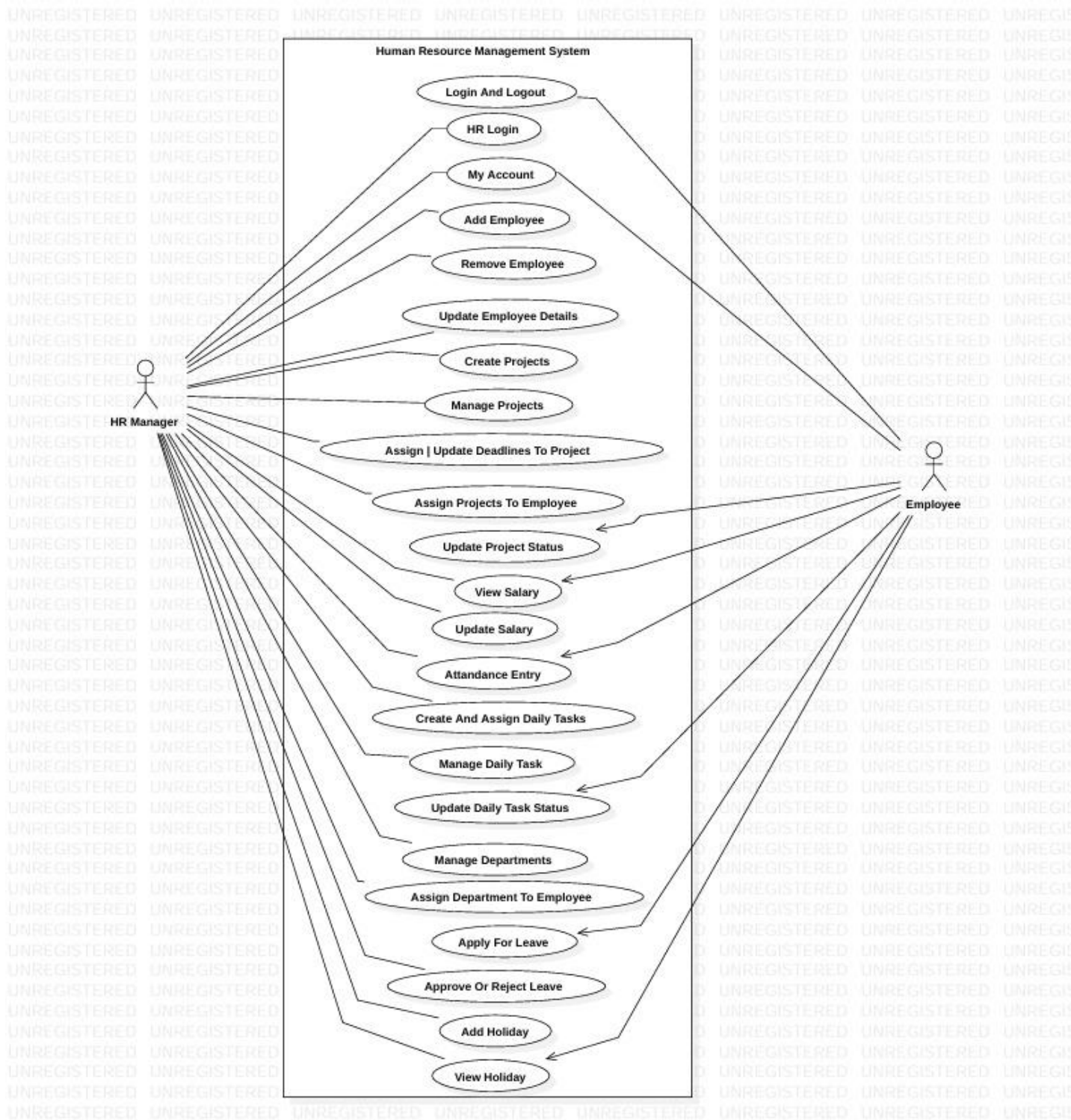


Fig: UseCase Diagram of Human Resource Management

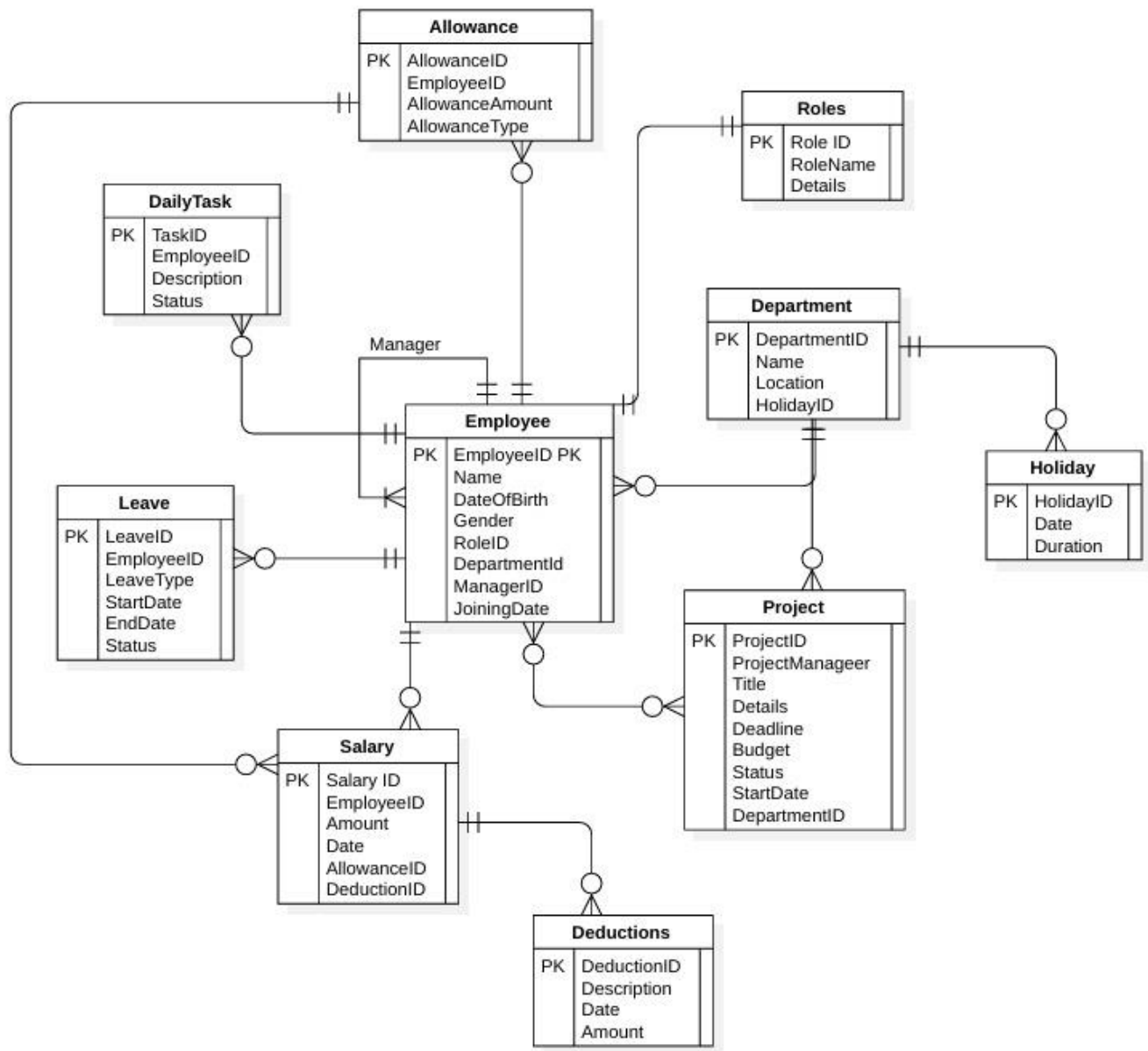


Fig: Entity Diagram of Human Resource Management

## V. RESULT/ PROJECT MODULES

The project result for a Human Resource Management System (HRMS) typically involves the successful implementation of a comprehensive software solution designed to manage various HR functions. Here is an explanation of what the project result might include:

- **Employee Management:** The system allows for the addition, deletion, and updating of employee records. This includes personal details, job titles, departments, and employment status.
- **Payroll Management:** Automated processing of payroll, including salary calculations, tax deductions, and generation of payslips.
- **Leave Management:** Leave applications, approvals, and balance management.
- **Performance Evaluation:** Tools for setting performance goals, conducting appraisals, and managing employee feedback.

Here are some project modules or screenshots which we have done in our project:

## 1. Adding Employee:

This interface is for adding the employee details by the HR. Initially the HR is required to fill all the details of an employee correctly like name, salary, department, role, contact, gender, data of birth, email-id, address, username, and password. After entering all the details then and only then the form of an employee is enable to add an employee.

The 'Add Employee' form includes the following fields:

- Full name:** Text input (placeholder: Name)
- Base Salary:** Text input (placeholder: 0)
- Department:** Dropdown menu (placeholder: Select Department)
- Role:** Dropdown menu (placeholder: Select Role)
- Contact:** Text input (placeholder: 0)
- Gender:** Dropdown menu (placeholder: Select Gender)
- DOB:** Text input (placeholder: mm/dd/yyyy)
- Email Address:** Text input (placeholder: Email Address)
- Address:** Text input (placeholder: Permanent address)
- Username:** Text input (placeholder: Username)
- Password:** Text input (placeholder: Password)
- Profile:** File upload button (placeholder: Choose File) and status (No file chosen)

At the bottom of the form is a blue 'Add Employee' button.

On the right, there is a table of existing employees:

#	Name	Dept	Salary	Contact	Role	Details	Delete	Update
1	Akhilesh Vijay Malabade	Development	56000	7020451422	Development Manager	Details	Delete	Update
2	Alankar Malabade	Development	56000	8007123544	Developer	Details	Delete	Update
3	Sanskriti Chavan	Testing	65000	8596745269	Testing Manager	Details	Delete	Update
4	Avadhut Patil	Testing	65000	9685745869	Tester	Details	Delete	Update
5	Juhi Rastogi	Marketing	65000	7485968574	Marketing Manager	Details	Delete	Update
6	Rushikesh Langute	Marketing	96000	8596748859	Developer	Details	Delete	Update
7	Pratiksha Nimbalkar	Development	96000	8569362574	Tester	Details	Delete	Update
8	Vaishnavi Sutar	Testing	85000	7485965869	Tester	Details	Delete	Update
9	Shivani Shinde	Development	96000	9696969696	Developer	Details	Delete	Update

Navigation: < Previous 1 2 Next >

## 2. Employee Profile:

This interface is for showing the profile of an employee which is added by the HR. And all the Events, Projects, and Allowances which are assigned to that employee will display here.

The 'Employee Profile' page displays the following information:

- Header:** Home, leave, Logout
- Employee Info:**
  - Name:** Sanskriti Chavan
  - Email:** sa@gmail.com
  - Actions:** Edit, Edit Profile, Remove Profile
- Personal Information:**

Employee Id	Gender	Salary	Contact
3	female	65000	8596745269

Address: kolhapur
- Department Information:**

Department	Role
Testing	Testing Manager
- Allowances:**

Id	Name	Amount
3	Food Allowance	969696
1	Travel Allowance	696969
- Events:**

Id	Name	Start	Duration
1	Guest Lecture ML	2024-05-03	2 days
- Projects:**

Id	Name	Start	End	Status
3	Library Management	2024-05-03	2024-05-24	Pending
1	Hotel Management	2024-05-01	2024-05-12	Pending
2	Cafe Management	2024-04-30	2024-05-11	Pending

## 3. Assigning Project to Employee:



This interface is for assigning the projects to the employee with all the form validation. After assigning the project if any case there is any confusion or misunderstanding happens then HR can update the details of that project. Also he can delete or change the employee which is assigned to that project with all the form validation.

**Project Form:**

Project Name\*: Cafe Management

Project Description\*: Cafe application

Add Employees\*: [Dropdown]

Budget\*: 690000

Start Date\*: 04/30/2024

End Date\*: 05/11/2024

**Add Project**

**Projects Table:**

#	Name	Budget	Start Date	End Date	Status	Details	Delete	Update
1	Hotel Management	690000	2024-05-12	2024-05-12	Pending	<a href="#">Details</a>	<a href="#">Delete</a>	<a href="#">Update</a>
2	Cafe Management	690000	2024-05-11	2024-05-11	Pending	<a href="#">Details</a>	<a href="#">Delete</a>	<a href="#">Update</a>
3	Library Management	850000	2024-05-24	2024-05-24	Pending	<a href="#">Details</a>	<a href="#">Delete</a>	<a href="#">Update</a>

**Cafe Management Modal:**

Project Name: Cafe Management

Project Description: Cafe application

Add Employees: Avadhut Patil

Budget: 690000

Start Date: 04/30/2024

End Date: 05/11/2024

Project status: Pending

**Assigned Employees Table:**

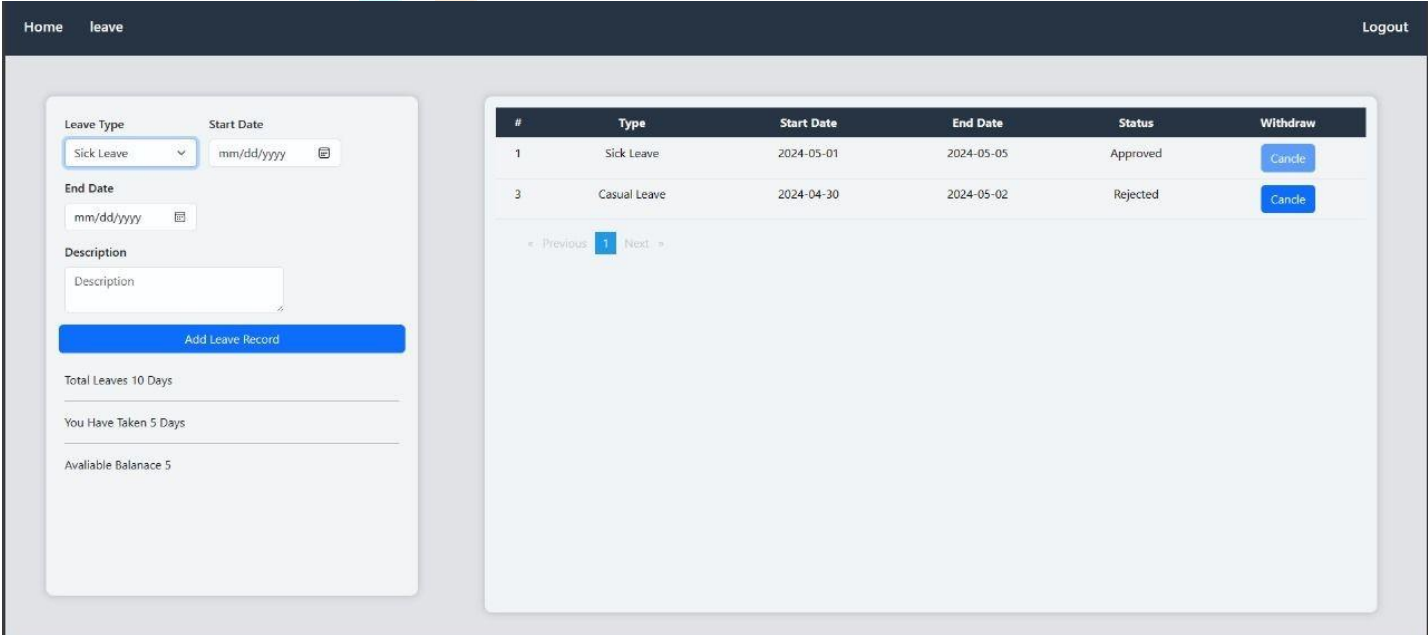
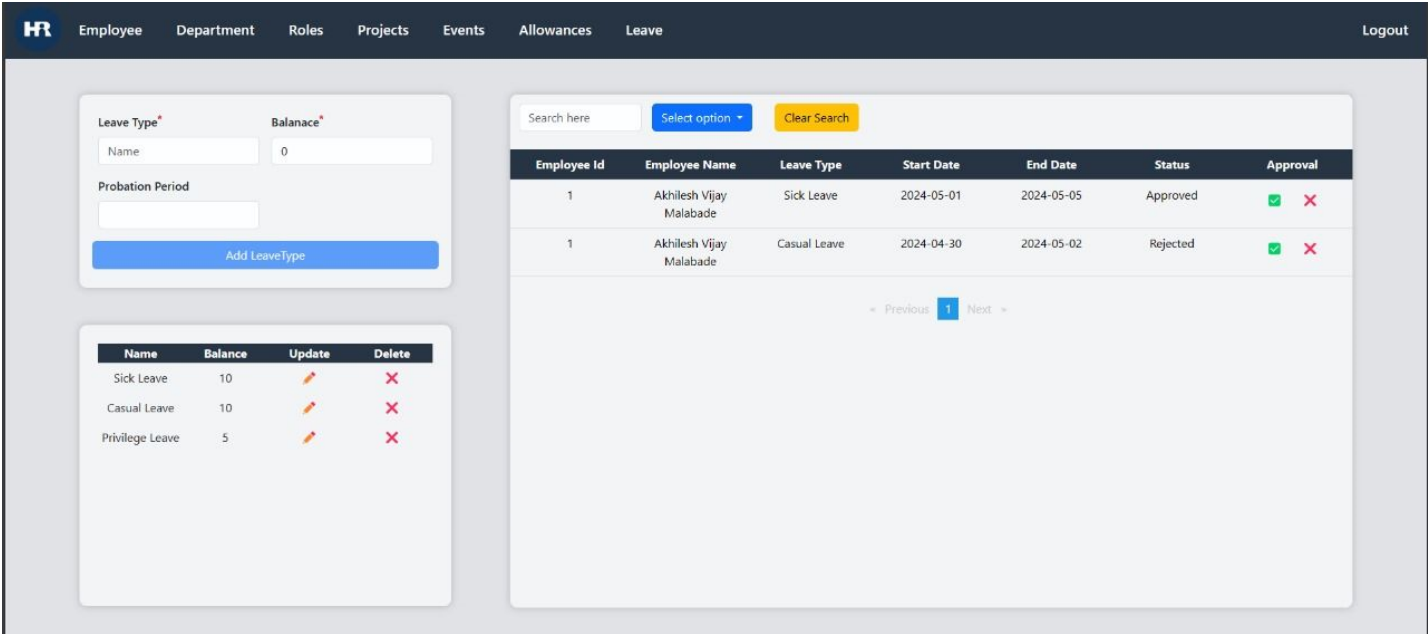
#	Name	Role	Details	Delete
2	Alankar Malabade	Developer	<a href="#">Details</a>	<a href="#">Delete</a>
6	Rushikesh Langute	Developer	<a href="#">Details</a>	<a href="#">Delete</a>
1	Akhilesh Vijay Malabade	Development Manager	<a href="#">Details</a>	<a href="#">Delete</a>
3	Sanskriti Chavan	Testing Manager	<a href="#">Details</a>	<a href="#">Delete</a>
5	Juhi Rastogi	Marketing Manager	<a href="#">Details</a>	<a href="#">Delete</a>

**Buttons:** Close, Update Project

#### 4. Leaves Of Employee:

This interface is for adding the leave records and balances of leaves remained to that employee. In employee login when employee applied for the leave then that application is going to the HR in form of notification and he decided to approve or reject that leave when he click on approval then status will change to “Approved” and when he clicked on reject then leave will reject and status will change to rejected.

In any case if employee wants to cancel their leave then he can told to HR that cancel the leave then HR will cancel the leave on urgent basis.



VI. CONCLUSIONANDFUTURE SCOPE

- CONCLUSION

In conclusion, Human Resource Management (HRM) systems play a crucial role in modern organizations by facilitating the effective management of the workforce to achieve strategic goals and objectivesThrough the integration of various HR functions and the adoption of innovative technologies, HRM systems streamline processes, enhance efficiency, and improve decision-making. From traditional ERP systems to cloud-based solutions, talent management platforms, and AI-powered tools, there is a wide range of existing work in HRM systems catering to the diverse needs of organizations of all sizes and industries.

These systems enable HR professionals to perform key functions such as recruitment, training, performance management, and compliance more efficiently, while also empowering employees through self-service portals and mobile applications. Additionally, the use of workforce analytics and AI technologies provides valuable insights into workforce trends, enabling organizations to make data-driven decisions to optimize their human capital. Looking ahead, the future of HRM systems is likely to be characterized by further advancements in technology, including the widespread adoption of AI, blockchain, and predictive analytics. These technologies will continue to revolutionize HR practices, driving greater automation, personalization, and agility in managing the workforce. Moreover, as the nature of work continues to evolve and become more digital and remote, HRM systems will play an increasingly pivotal role in supporting flexible work arrangements, fostering employee engagement, and nurturing a culture of continuous learning and development.

## •FUTURE SCOPE

The future of Human Resource Management (HRM) is expected to be dynamic and transformative, driven by technological advancements, changing demographics, evolving work structures, and shifting employee expectations. Here are some key aspects that are likely to shape the future scope of HRM:

1. **\*\*Technology Integration\*\***: HRM will increasingly leverage technology for various functions such as recruitment, training, performance management, and employee engagement. Artificial Intelligence (AI), machine learning, data analytics, and HR software will streamline processes, enhance decision-making, and provide insights for strategic workforce planning.
2. **\*\*Remote Work and Flexibility\*\***: The rise of remote work and flexible work arrangements will necessitate new HR policies and practices to effectively manage virtual teams, ensure productivity, maintain employee well-being, and foster a sense of belonging and collaboration among distributed employees.
3. **\*\*Skills Development and Lifelong Learning\*\***: Continuous learning and upskilling will be crucial as jobs evolve due to automation and technological advancements. HRM will focus on facilitating learning opportunities, developing personalized training programs, and promoting a culture of lifelong learning to adapt to changing skill requirements.
4. **\*\*Employee Well-being and Mental Health\*\***: Recognizing the importance of employee well-being and mental health, HRM will prioritize initiatives to support work-life balance, reduce stress, and provide resources for mental health support. This may include flexible work arrangements, employee assistance programs, and promoting a culture of open communication and support.
5. **\*\*Agile Workforce and Talent Management\*\***: HRM will need to adapt to the gig economy and the rise of flexible talent models. Managing a diverse workforce comprising full-time employees, contingent workers, freelancers, and contractors will require agile talent management strategies focused on talent acquisition, engagement, and retention.
6. **\*\*Leadership Development and Succession Planning\*\***: HRM will invest in developing future leaders and succession planning to ensure continuity and sustainability. Identifying and nurturing leadership talent, creating leadership development programs, and implementing robust succession plans will be critical for long-term organizational success.

## I. REFERENCES

- a) "Human Resource Management" by Gary Dessler - This textbook provides a comprehensive overview of HRM practices, including topics such as recruitment, selection, training, performance management, compensation, and employee relations.
- b) "Human Resource Management: Theory and Practice" by John Bratton and Jeffrey Gold - This book covers both theoretical concepts and practical applications of HRM, with a focus on contemporary issues and challenges in the field.
- c) "Strategic Human Resource Management: Theory and Practice" by Graeme Salaman, John Storey, and Jonathan Billsberry - This text explores the strategic aspects of HRM, including how HR practices can contribute to organizational success and competitive advantage.
- d) "Human Resource Management Systems: Strategies, Tactics, and Techniques" by Kavanagh, Thite, and Johnson - This book offers insights into the design, implementation, and management of HRM systems, with a focus on technology driven solution.

