

Employeeix HRM CRM: A Web-Based Human Resource and Employee Management System

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Abstract

Employeeix HRM CRM is a proposed web-based Human Resource and Employee Management System designed to centralize and streamline major human resource activities within an organization. The system addresses the limitations of fragmented processes based on spreadsheets, email, messaging applications, paper records, and disconnected HR activities. It brings recruitment and candidate management, onboarding, employee records, departments, attendance, leave, payroll-related information, performance management, document management, communication, and reporting into a centralized platform. Role-based access is provided for Admin, HR Manager, Department Manager, Recruiter, and Employee users. The proposed implementation uses Java with JSP/Servlet and Spring Boot, MySQL as the database, and Apache Tomcat as the application server, with HTML5, CSS3, JavaScript, and Bootstrap 5 for the web interface. Authentication and authorization are supported through JWT-based authentication, password hashing, input validation, database constraints, and role-based access control. The project follows an Agile software development approach with an analytical and experimental research design. The system reduces manual administrative overhead, improves data accessibility, and establishes a consistent foundation for institutional HR decision-making. As the platform is currently structured across progressive development modules, this paper focuses on architectural design, data integrity, and workflow modeling rather than empirical benchmarks.

Keywords— Human Resource Management, Employee Management, HRMS, Recruitment, Attendance, Payroll, Role-Based Access Control

1. Introduction

Human Resource Management (HRM) involves a broad set of activities covering recruitment, employee records, attendance, leave, payroll, performance, documentation, communication, and employee development. When these activities are handled through spreadsheets, paper records, email, messaging applications, or separate tools, organizations may face duplicated information, inconsistent records, delayed approvals, and difficulty in accessing current employee information. The Employeeix HRM CRM project proposes a centralized web-based system to organize these activities within one platform.

The project is designed around five principal user roles: Admin, HR Manager, Department Manager, Recruiter, and Employee. Each role receives access according to its responsibilities. The system therefore combines employee lifecycle management with operational HR functions while maintaining controlled access to information. By centralizing records and workflows, the project aims to reduce repetitive administrative work and improve coordination between employees, managers, recruiters, and HR personnel.

Employeeix is designed as a modular system covering secure authentication, role-based access, recruitment, onboarding, attendance logging, leave approvals, payroll record management, performance tracking, document storage, and analytical dashboards.

2. Problem Statement

Many small-to-mid-sized institutions operate in fragmented administrative environments where personnel information is maintained across disjointed spreadsheets, email threads, messaging applications, and physical registers. Such

fragmentation can lead to duplication, data-entry errors, delayed approvals, difficulty tracking HR information, and inefficient communication. Employeeix addresses this problem by proposing a centralized web application that organizes HR information and workflows according to user roles.

3. Objectives

- Automate routine HR activities and reduce dependence on manual records.
- Centralize employee information and HR-related records in a structured database.
- Support recruitment, candidate management, onboarding, and employee lifecycle activities.
- Provide attendance and leave management with role-based access and approval workflows.
- Organize payroll-related information and performance-management activities.
- Provide controlled access through role-based authorization for Admin, HR Manager, Department Manager, Recruiter, and Employee.
- Improve accessibility of HR information, communication, reporting, and administrative decision support.
- Reduce duplication and data-entry errors through centralized storage, validation, and database constraints.

4. Related Work

The related literature ranges from empirical studies and meta-analyses of electronic HRM to concrete employee-management systems. Recent system-oriented work describes digital handling of leave, performance, recruitment, onboarding, attendance, and employee records, while research-oriented studies examine the organizational and functional dimensions of E-HRM. The project literature therefore supports the relevance of integrated digital HR workflows, while the documented Employeeix scope combines multiple HR functions and user roles in one system.

Table 1: Selected Related Work

Study	Focus	Relevant Contribution	Difference / Gap
Padwal et al. (2026)	Employee performance and leave management	Role-based digital workflows for leave and performance	Narrower functional/institutional scope
Zhao et al. (2025)	Platform-based HRM practices	Six functional dimensions and measurement of digital HRM practices	Research model rather than student system implementation
Ravi Kumar et al. (2025)	HRMS	Recruitment, onboarding, attendance, leave and off-boarding	Does not cover the full Employeeix scope
Peer R. et al. (2025)	Employee management system	Attendance, leave, payroll and performance	Primarily employee-management operations
Jain et al. (2023)	E-HRM practices	Online recruitment, training and performance monitoring	Cross-sectional research study
Cheng & Zou (2021)	E-HRM meta-analysis	Evidence concerning E-HRM and organizational performance	Research-level evidence, not system implementation
Zhou et al. (2022)	E-HRM meta-analysis	Antecedents, consequences and cross-national moderators	Broad research synthesis

Elsawy & Elbadawi (2021)	E-HRM empirical study	Recruitment, performance, communication and compensation	Organizational empirical study rather than integrated application
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5. Proposed System and Methodology

5.1 Architecture Overview

Employeeix HRM CRM is structured around a three-tier client-server architecture:

- Presentation Tier: Developed using HTML5, CSS3, JavaScript, and Bootstrap 5 to deliver responsive web dashboards customized for each authenticated user role.
- Application Tier: Powered by Java using Spring Boot and JSP/Servlets hosted on an Apache Tomcat server. This tier handles business logic, request validation, service routing, and transaction handling.
- Data Management Tier: Built on a MySQL relational database enforcing entity relationships, foreign-key constraints, and unique indexes to preserve record consistency.

5.2 Role-Based Access Control (RBAC)

To enforce operational boundaries and safeguard sensitive institutional records, system permissions are partitioned across five distinct roles:

- Admin: Manages master configurations, system credentials, and complete institutional audits.
- HR Manager: Administers recruitment postings, onboarding transitions, department allocations, and employee lifecycle records.
- Department Manager: Evaluates departmental attendance, approves or rejects leave requests, and submits cyclical performance reviews.
- Recruiter: Manages candidate profiles, tracks applicant pipelines, and records interview evaluations.
- Employee: Accesses self-service functions including attendance clocking, leave applications, document downloads, and personal review history.

5.3 Security and Access Control

System security is implemented as an architectural baseline rather than an auxiliary module. User authentication relies on JSON Web Tokens (JWT) to secure stateless client-server sessions. User passwords are encrypted using one-way cryptographic hashing prior to database storage. At the controller level, input sanitization and parameterized queries protect against Cross-Site Scripting (XSS) and SQL injection attacks, while database foreign-key constraints ensure transactional referential integrity.

5.4 Development Approach

Development follows an Agile methodology across five modular phases:

- Phase 1: Requirements specification, use-case mapping, and relational database schema normalization.
- Phase 2: Authentication pipeline, password hashing, and role-based routing filters.
- Phase 3: Employee master directories, attendance logging, and leave management workflows.

- Phase 4: Recruitment candidate tracking, digital onboarding, and payroll slip management.
- Phase 5: Document repository integration, dashboard reporting, and system verification.

6. Project Progress and Evaluation Plan

System development is mapped across five planned sprints. Module 1 (architecture and database schema design) represents the initial baseline phase, followed sequentially by Module 2 (authentication and dashboards), Module 3 (lifecycle and attendance operations), Module 4 (payroll records, performance, and documents), and Module 5 (reporting and system testing).

For publication-quality evaluation, the completed implementation should be assessed using functional test cases for each role and module, database-integrity tests, authentication and authorization tests, representative response-time measurements, and usability feedback. These evaluation benchmarks will be executed upon final module deployment; hence, empirical performance metrics are reserved for future work.

7. Limitations and Future Work

7.1 Limitations

- Data quality depends on accurate and timely information entered by authorized users.
- HR records contain sensitive information, so privacy and security controls must be maintained throughout implementation and deployment.
- Integration with external enterprise ERP systems and biometric hardware is outside the currently documented scope.
- Scalability and performance under large workloads require further evaluation after implementation.

7.2 Future Work

- Complete the implementation and integration of all planned modules.
- Conduct security testing of authentication, authorization, input validation, and session handling.
- Measure performance under representative numbers of users and records.
- Evaluate usability with representative HR and employee users.
- Document deployment configuration, backup/recovery, and operational monitoring.

8. Conclusion

Employeeix HRM CRM proposes a centralized web-based approach to human resource and employee management. By combining recruitment, onboarding, employee records, attendance, leave, payroll-related information, performance, documents, communication, and reporting within a role-aware system, the project addresses the fragmentation identified in the project documentation. The selected Java-based stack with JSP/Servlet, Spring Boot, MySQL, and Apache Tomcat provides the implementation basis, while JWT authentication, password hashing, validation, database constraints, and role-based access control address the documented security requirements. The project is being developed using an Agile, modular approach. As the platform is currently structured across ongoing developmental phases rather than complete empirical evaluation, quantitative performance measurements remain an area for future operational study. Future work should complete the remaining modules, conduct functional and security testing, evaluate usability and performance, and document quantitative results.

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