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Human Payroll and Task Lifecycle System Using Java Spring Boot

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Abstract: Human Resource management is an essential function in every organization, involving employee administration, payroll processing, attendance monitoring, and task management. Traditional HR systems often rely on manual processes or disconnected software applications, leading to data inconsistency, processing delays, and increased administrative workload. To overcome these limitations, this paper presents the Human Payroll and Task Lifecycle System, a web-based application developed using Java Spring Boot, MySQL, HTML, CSS, JavaScript, and Bootstrap. The proposed system integrates employee management, payroll generation, attendance tracking, and task assignment into a single centralized platform. Managers can efficiently allocate tasks, monitor employee progress, maintain attendance records, and generate payroll reports, while employees can securely access assigned tasks, attendance details, and salary information. The backend utilizes Spring Boot to implement secure business logic and RESTful services, whereas MySQL ensures structured and reliable data storage. The responsive frontend provides an intuitive interface that supports multiple devices and improves usability. The modular architecture enhances scalability, maintainability, and security while minimizing manual intervention. Experimental evaluation demonstrates that the proposed system significantly improves operational efficiency, reduces processing errors, and simplifies organizational workforce management. The system provides a reliable foundation for future enhancements such as cloud deployment, AI-driven analytics, mobile application support, and real-time notifications.

I. INTRODUCTION

Human Resource Management has evolved significantly with the rapid advancement of information technology. Organizations today require efficient digital solutions to manage employee records, attendance, payroll processing, and task allocation while ensuring data accuracy and security. Many organizations, particularly small and medium enterprises, continue to rely on spreadsheets or standalone applications for HR operations. These traditional approaches increase the possibility of calculation errors, duplicate records, delayed payroll processing, and inefficient communication between employees and managers.

The Human Payroll and Task Lifecycle System is designed to automate major HR activities through an integrated web-based platform. Instead of maintaining separate applications for payroll, attendance, employee records, and task management, the proposed system combines all functionalities into a unified environment. This integration simplifies administrative work, improves transparency, and enhances employee productivity.

The system enables administrators to maintain employee information, assign daily or project-based tasks, monitor attendance, and generate payroll records automatically based on predefined salary structures. Employees can log into the system securely to view assigned tasks, update work status, review attendance records, and access payroll information. The application minimizes paperwork and eliminates repetitive manual operations by maintaining centralized digital records.

The proposed application is developed using Java Spring Boot, which provides a secure and scalable backend framework capable of handling enterprise-level business operations. MySQL serves as the relational database management system for storing employee data, payroll information, attendance logs, and task details. HTML, CSS, JavaScript, and Bootstrap are used to create a responsive and user-friendly interface that works efficiently across multiple devices.

By integrating modern web technologies with structured database management, the Human Payroll and Task Lifecycle System provides organizations with an effective solution for improving workforce management, reducing operational costs, and enhancing decision-making capabilities.

II. EXISTING SYSTEM

Most organizations still depend on conventional Human Resource Management practices that involve manual record maintenance or multiple disconnected software applications. Employee information, attendance records, payroll calculations, and task assignments are often maintained independently, making data synchronization difficult and increasing administrative complexity.

Traditional payroll management systems primarily focus on salary calculations without integrating attendance management or employee task tracking. As a result, HR personnel must manually verify attendance records before generating payroll, increasing processing time and the possibility of human error. Similarly, task management is usually handled through emails, spreadsheets, or messaging applications, making it difficult to monitor employee performance effectively.

Existing systems also provide limited automation in attendance verification and employee performance monitoring. Managers frequently encounter challenges while assigning tasks, tracking deadlines, and generating consolidated reports for decision-making. Data redundancy, inconsistent record maintenance, and insufficient security mechanisms further reduce the overall effectiveness of these systems.

Another limitation of conventional HR solutions is the absence of centralized employee information. Maintaining separate databases for payroll, attendance, and employee management creates inconsistencies that affect reporting accuracy and increase maintenance costs. Furthermore, many existing applications lack responsive user interfaces and are not optimized for modern web environments, reducing accessibility for employees working remotely.

Although several commercial HR management platforms provide advanced features, they are often expensive, require complex deployment, and are not suitable for small and medium-sized organizations with limited financial resources. Therefore, there is a growing need for an integrated, scalable, secure, and cost-effective Human Payroll and Task Lifecycle System capable of automating complete workforce management.

A. Challenges

Based on the analysis of existing Human Resource Management systems, several significant challenges have been identified.

- 1) **Manual Payroll Processing:** Many organizations still perform payroll calculations manually or using spreadsheet software. Manual salary computation increases the possibility of calculation errors, delayed salary generation, incorrect deductions, and inconsistent payroll records.
- 2) **Lack of Integrated Employee Management:** Employee information, attendance, payroll, and task assignments are frequently maintained in separate systems. This fragmentation results in duplicate records, inconsistent information, and increased administrative effort during employee management.
- 3) **Inefficient Task Monitoring:** Most organizations assign employee tasks through emails or messaging platforms without centralized monitoring. Managers find it difficult to track task progress, evaluate employee productivity, and maintain project completion history efficiently.
- 4) **Attendance Management Issues:** Manual attendance recording consumes considerable time and increases the possibility of incorrect entries. Errors in attendance records directly affect payroll calculations and employee performance evaluation.
- 5) **Limited Security and Data Integrity:** Conventional systems often lack role-based authentication and secure access control mechanisms. Unauthorized access to employee information and payroll records may compromise sensitive organizational data.
- 6) **Poor Scalability:** Many existing HR applications are designed for small datasets and become inefficient as the number of employees increases. Performance degradation, database redundancy, and reporting delays affect organizational productivity.
- 7) **Lack of Real-Time Reporting:** Existing systems provide limited analytical capabilities and do not support real-time dashboards for monitoring employee attendance, payroll summaries, or task completion statistics. This restricts managerial decision-making and operational planning.

III. PROPOSED SYSTEM

The proposed Human Payroll and Task Lifecycle System introduces a centralized web-based platform that integrates employee management, attendance monitoring, payroll processing, and task lifecycle management into a single application. Unlike traditional HR systems that maintain separate modules or require manual intervention, the proposed solution automates the complete employee management process while ensuring security, scalability, and operational efficiency.

The application is developed using Java Spring Boot as the backend framework, MySQL as the relational database, and HTML, CSS, JavaScript, and Bootstrap for developing a responsive user interface. Spring Boot handles business logic, user authentication, RESTful services, and secure database communication, while MySQL provides structured storage for employee profiles, attendance records, payroll information, and assigned tasks.

The system supports two major user roles: Administrator (Manager) and Employee. Administrators can register employees, assign tasks, manage attendance, generate payroll records, monitor employee performance, and produce reports. Employees can securely log into the application to view assigned tasks, update task status, monitor attendance history, and access payroll details.

Attendance records are automatically linked with payroll processing to minimize manual verification and calculation errors. The task lifecycle module enables managers to assign tasks with deadlines, monitor progress, and evaluate completion status through an interactive dashboard.

The modular architecture ensures that future enhancements such as cloud deployment, AI-based workforce analytics, mobile applications, and real-time notifications can be incorporated without significant architectural modifications.

The proposed Human Payroll and Task Lifecycle System improves operational efficiency, reduces administrative workload, enhances data consistency, strengthens organizational security, and provides a scalable platform suitable for educational institutions, corporate organizations, and small to medium-sized enterprises.

IV. ALGORITHM

The proposed Human Payroll and Task Lifecycle System follows a modular architecture that integrates employee management, attendance monitoring, payroll generation, and task lifecycle management into a single web application. The system utilizes Java Spring Boot for backend processing, MySQL for structured data storage, and HTML, CSS, JavaScript, and Bootstrap for developing a responsive user interface. The application follows a secure authentication mechanism, ensuring role-based access for administrators and employees. Each module communicates with the database through RESTful APIs, enabling seamless execution of business operations.

A. User Authentication

The system begins with a secure login process where users authenticate using their registered credentials. Spring Boot validates the username and password by comparing encrypted passwords stored in the MySQL database. After successful authentication, users are redirected to their respective dashboards based on their assigned roles. Administrators gain access to employee management, payroll generation, attendance tracking, and task assignment, whereas employees can view their attendance, assigned tasks, and payroll details.

B. Employee Management

The administrator manages complete employee information through a centralized dashboard. New employee records are created by entering personal information, department details, salary information, and employment status. Existing records can be updated whenever required, while inactive employees can be disabled without deleting historical records. The system maintains data consistency by validating employee information before storing it in the database.

C. Attendance Monitoring

Attendance management is performed through a structured workflow where employee attendance is recorded daily. The system stores check-in time, check-out time, total working hours, and attendance status. Attendance records are directly linked with payroll generation, reducing manual calculations and ensuring salary accuracy. Managers can also retrieve attendance reports for specific employees or departments whenever required.

D. Task Assignment and Tracking

Managers assign tasks to employees by specifying task descriptions, deadlines, and priorities. Employees can access their assigned tasks through their dashboard and update task status as Assigned, In Progress, or Completed. The system continuously monitors task progress, enabling administrators to evaluate employee productivity and pending assignments. Historical task information is preserved for future reference and performance evaluation.

E. Payroll Processing

Payroll generation is automated using employee salary information and attendance records. The application calculates monthly salary by considering base salary, bonuses, deductions, and attendance information. Payroll reports are generated automatically and stored securely within the database. Employees can view their salary information while administrators can generate payroll summaries for all employees.

F. System Evaluation

The overall system performance is evaluated by testing individual modules including authentication, employee management, attendance tracking, task management, and payroll processing. Functional testing confirms that each module performs accurately while maintaining secure communication with the database. Integration testing verifies smooth interaction among all system components.

V. TECHNIQUES

The Human Payroll and Task Lifecycle System utilizes modern web development technologies that ensure scalability, maintainability, security, and efficient data management.

A. Java Spring Boot

Spring Boot serves as the backend development framework responsible for implementing business logic, RESTful web services, authentication, and database connectivity. Its layered architecture simplifies application development while reducing configuration complexity. Spring Boot also provides dependency injection, exception handling, and secure request processing, making the application highly reliable.

B. MySQL Database

MySQL is used as the relational database management system for storing employee records, attendance details, payroll information, user credentials, and task assignments. The database follows normalization principles to eliminate redundancy and maintain referential integrity using primary and foreign key relationships.

C. HTML, CSS, and Bootstrap

The frontend interface is developed using HTML and CSS to create structured and visually appealing web pages. Bootstrap enhances responsiveness by providing mobile-friendly layouts, navigation components, responsive tables, forms, and interactive user interfaces that function efficiently across different screen sizes.

D. JavaScript

JavaScript improves client-side interactivity by performing form validation, dynamic content updates, asynchronous requests, and immediate user feedback. AJAX and Fetch API reduce page reloads by exchanging data with the backend asynchronously, improving overall user experience.

E. REST APIs

RESTful APIs establish communication between the frontend and backend components. HTTP methods such as GET, POST, PUT, and DELETE perform CRUD operations efficiently. This modular communication architecture allows future integration with mobile applications and external enterprise systems.

F. Spring Data JPA

Spring Data JPA simplifies database operations by providing repository interfaces that automatically generate SQL queries. This minimizes coding effort while ensuring efficient interaction between Java entities and database tables.

VI. METHODOLOGY

The Human Payroll and Task Lifecycle System follows a systematic development methodology consisting of multiple interconnected phases.

Initially, administrators authenticate themselves using secure login credentials. After successful authentication, administrators manage employee information, assign tasks, record attendance, and generate payroll reports. Employees access the system using their personal credentials to view assigned tasks, attendance records, and payroll information.

The workflow begins by registering employee details into the database. Attendance information is updated daily, while managers assign tasks with predefined deadlines. Employees update their task progress periodically. At the end of each payroll cycle, the application automatically computes salary based on attendance records, base salary, bonuses, and deductions.

The backend processes all requests through Spring Boot controllers, service classes, and repository layers. Business logic validates incoming requests before storing information within the MySQL database. Retrieved data is displayed dynamically through responsive frontend interfaces developed using HTML, CSS, Bootstrap, and JavaScript.

The modular architecture allows independent execution of employee management, attendance, payroll, and task lifecycle modules while maintaining secure communication between each layer. This separation improves maintainability, scalability, and future extensibility.

A. System Workflow

The overall system workflow consists of the following sequence:

- 1) User Login
- 2) Authentication and Authorization
- 3) Employee Registration
- 4) Attendance Recording
- 5) Task Assignment
- 6) Employee Task Update
- 7) Payroll Generation
- 8) Report Generation
- 9) Logout

B. System Outputs

Figure 1: Login Page

Figure 2: Administrator Dashboard

Figure 3: Employee Registration Module

Figure 4: Attendance Management Module

Figure 5: Task Assignment Dashboard

Figure 6: Payroll Generation Report

VII. CONCLUSION

The Human Payroll and Task Lifecycle System provides a comprehensive web-based solution for managing essential Human Resource operations within a centralized platform. The integration of employee management, attendance tracking, payroll generation, and task lifecycle management significantly reduces manual effort while improving operational accuracy and organizational productivity.

The implementation of Java Spring Boot, MySQL, HTML, CSS, JavaScript, and Bootstrap creates a secure, scalable, and responsive application capable of handling day-to-day HR activities efficiently. Role-based authentication ensures secure access to sensitive employee information, while automated payroll processing minimizes human errors and administrative workload. The task lifecycle module improves employee accountability by enabling managers to assign, monitor, and evaluate work progress through an interactive dashboard.

The modular architecture allows organizations to extend the application according to future business requirements. Additional features such as artificial intelligence-based workforce analytics, cloud deployment, mobile application support, biometric attendance integration, and real-time notifications can be incorporated without affecting the existing system structure.

Overall, the Human Payroll and Task Lifecycle System provides an effective digital transformation solution for organizations seeking to improve workforce management, enhance operational efficiency, strengthen data security, and support long-term organizational growth. It offers a reliable and scalable foundation suitable for educational institutions, corporate enterprises, government organizations, and small to medium-sized businesses.

REFERENCES

- [1] R. Johnson, J. Hoeller, J. Arendsen, T. Risberg, and C. Sampaleanu, Professional Java Development with the Spring Framework, Indianapolis, IN, USA: Wiley Publishing, 2005.
- [2] C. Walls, Spring Boot in Action, Manning Publications, Shelter Island, NY, USA, 2016.
- [3] R. Elmasri and S. B. Navathe, Fundamentals of Database Systems, 7th ed., Pearson Education, 2017.
- [4] A. Silberschatz, H. F. Korth, and S. Sudarshan, Database System Concepts, 7th ed., McGraw-Hill Education, 2020.

- [5] D. Flanagan, JavaScript: The Definitive Guide, 7th ed., O'Reilly Media, 2020.
- [6] J. Duckett, HTML and CSS: Design and Build Websites, John Wiley & Sons, 2014.
- [7] M. Grinberg, Flask Web Development, 2nd ed., O'Reilly Media, 2018.
- [8] Oracle Corporation, Java Platform, Standard Edition Documentation, Oracle Corporation, Redwood Shores, CA, USA.
- [9] Oracle Corporation, MySQL 8.0 Reference Manual, Oracle Corporation, 2024.
- [10] Bootstrap Team, Bootstrap Documentation Version 5.3, 2024.
- [11] M. Fowler, Patterns of Enterprise Application Architecture, Addison-Wesley Professional, 2002.
- [12] I. Sommerville, Software Engineering, 10th ed., Pearson Education, 2016.

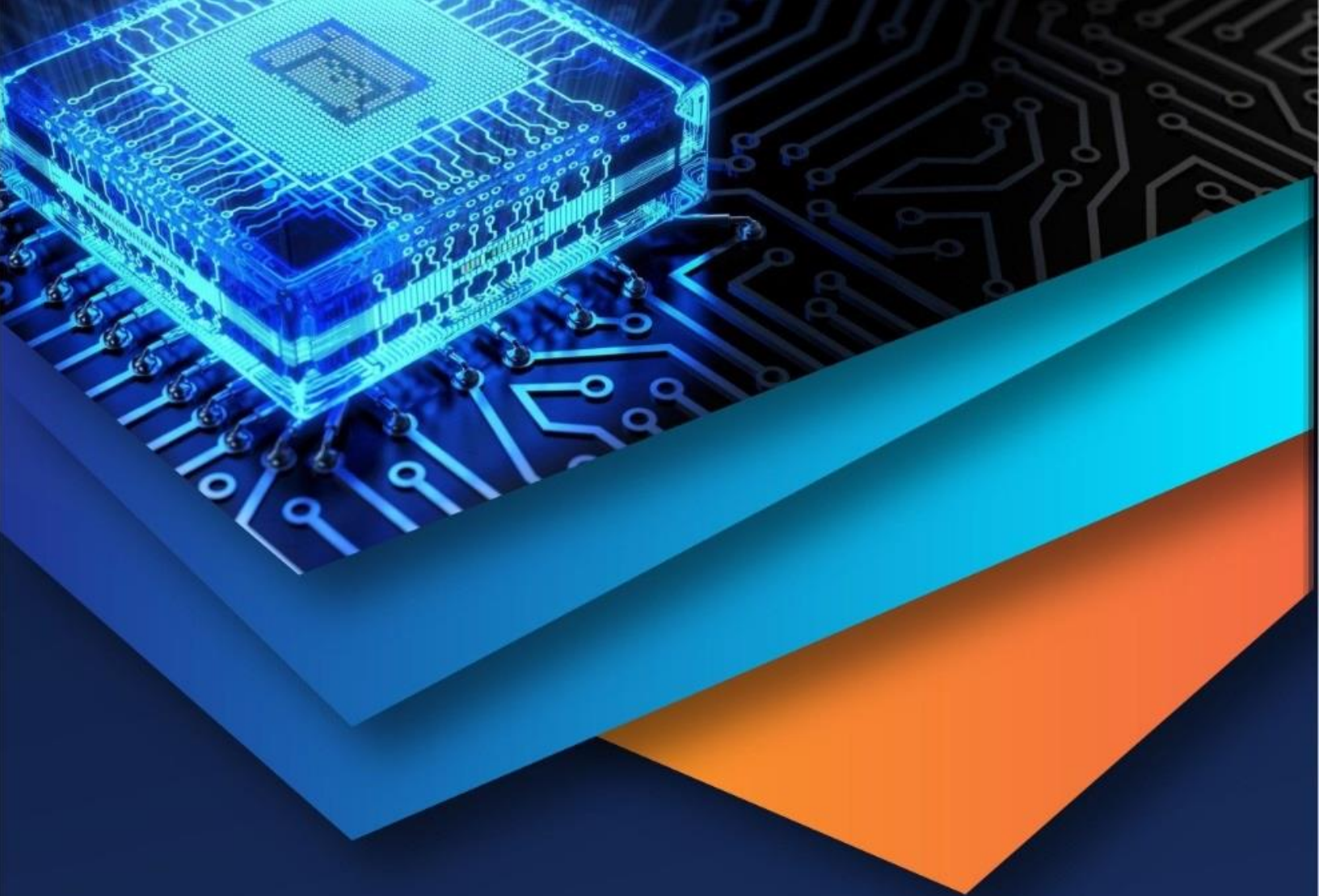
BIBLIOGRAPHY



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