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CareerHub: A Comprehensive Job Portal and Applicant Tracking System

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Abstract: *With the rapid digitization of the recruitment industry, there is a critical need for efficient platforms that bridge the gap between job seekers and employers. Traditional hiring processes often rely on fragmented communication channels, leading to disorganized application tracking, delayed feedback, and mismatched job profiles. This paper presents CareerHub—a modern web-based job portal and applicant tracking platform that streamlines the recruitment lifecycle. The platform includes dedicated modules for role-based authentication, job posting, advanced searching and filtering, application management, and interactive dashboards. Developed using React.js for a responsive frontend, Spring Boot for robust backend REST APIs, and MySQL (managed via MySQL Workbench) for reliable relational data storage, the system ensures high scalability and secure data handling. Evaluation of the platform demonstrates improved user engagement, faster job matching, and streamlined application tracking for both candidates and recruiters, establishing CareerHub as a highly effective solution for modern employment ecosystems.*

Keywords: Job Portal, Applicant Tracking System (ATS), Recruitment Platform, Spring Boot, React.js, MySQL, REST API, Web Application.

I. INTRODUCTION

The modern recruitment landscape has shifted significantly towards digital platforms, with job seekers and employers expecting streamlined, transparent, and rapid hiring processes. Today's job market requires more than simple static job boards; it demands dynamic platforms that provide advanced search algorithms, real-time application tracking, and secure data management for resumes and corporate profiles.

However, many existing solutions are either too expensive for small-to-medium enterprises (SMEs) or lack intuitive interfaces for entry-level job seekers. Workflows often rely on manual email submissions and unorganized spreadsheet tracking, which leads to lost applications, lack of candidate feedback, and extended hiring cycles.

CareerHub was developed to address these specific gaps. The system is designed as a full-stack, web-based recruitment platform that simplifies the hiring workflow while improving usability for both candidates and companies. The primary contributions of this work are:

Role-Based Management System: Distinct, secure workflows for Job Seekers, Employers.
Advanced Job Discovery: Dynamic search and filtering mechanisms based on location, experience, and skill set.
Application Tracking (ATS): Complete lifecycle tracking of job applications (Applied, Shortlisted, Rejected).

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Centralized Employer Dashboard: Tools for companies to manage job listings, review resumes, and update applicant statuses in real-time.

All modules share a unified relational database designed in MySQL Workbench, managed through a robust Spring Boot application layer, ensuring seamless data flow and high concurrency support.

II. RELATED WORK

Prior research on online recruitment systems and Applicant Tracking Systems (ATS) provides a strong foundation for the design decisions made in CareerHub.

Smith et al. [1] demonstrated that automated application tracking significantly reduces the "time-to-hire" metric by organizing candidate data into searchable, centralized databases rather than fragmented email inboxes. Johnson [2] highlighted the importance of responsive web design in job portals, noting that a majority of entry-level job seekers primarily use mobile devices to search and apply for jobs, making frontend frameworks like React highly relevant.

Gupta [3] identified secure data handling as a critical aspect of recruitment platforms, emphasizing that strict access control mechanisms are necessary to protect sensitive user data such as contact details and employment history. Several earlier platforms identified recurring limitations such as complex navigation and lack of transparency regarding application statuses [4]. CareerHub addresses these limitations by integrating a transparent tracking system and an intuitive UI powered by React and Spring Boot.

III. PROBLEM STATEMENT

The challenges faced by job seekers and hiring managers can be grouped into several observable problem areas.

First, traditional application methods (e.g., emailing resumes directly) lack structure, causing recruiters to lose track of promising candidates. Second, job seekers often suffer from a lack of transparency; once an application is submitted, they rarely receive updates on their status. Third, employers without access to enterprise-grade ATS software struggle to filter through hundreds of applications efficiently. Fourth, managing relational data (users, companies, jobs, applications) requires a rigid and secure database structure, which flat-file or purely manual systems cannot provide.

CareerHub addresses each of these limitations. Users can create specialized profiles, companies can post and manage jobs, and candidates can track their applications—all within a single, unified platform backed by a robust MySQL database.

IV. PROPOSED SYSTEM OVERVIEW

The platform connects job seekers and employers through a browser-based interface backed by Spring Boot and MySQL. Each user activity moves through a defined workflow:

Step 1: Role-Based Registration & Authentication: Users register as either a "Seeker" or "Employer". The system uses Spring Security and JWT (JSON Web Tokens) for secure session management.

Step 2: Profile & Company Setup: Seekers upload resumes and detail their skills; Employers create company profiles and branding.

Step 3: Job Management: Employers create, edit, or delete job postings, specifying criteria such as salary, location, and requirements.

Step 4: Search & Apply: Seekers browse active listings using multi-parameter filters and apply directly through the portal.

Step 5: Application Tracking: Employers review incoming applications and update statuses. Seekers can view these status changes in real-time on their dashboard.

Step 6: Admin Monitoring: System administrators monitor platform health, manage user disputes, and oversee total job postings.

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V. SYSTEM ARCHITECTURE

The platform is structured across a modern multi-tier architecture. The presentation tier delivers a dynamic, single-page application (SPA) experience using React.js, communicating asynchronously with the backend. The application tier processes HTTP requests through Spring Boot controllers, applying business logic via service layers before interacting with the database. The data access tier uses Spring Data JPA / Hibernate to map Java objects to relational tables. Finally, the database tier persists all data in MySQL, designed and optimized using MySQL Workbench.

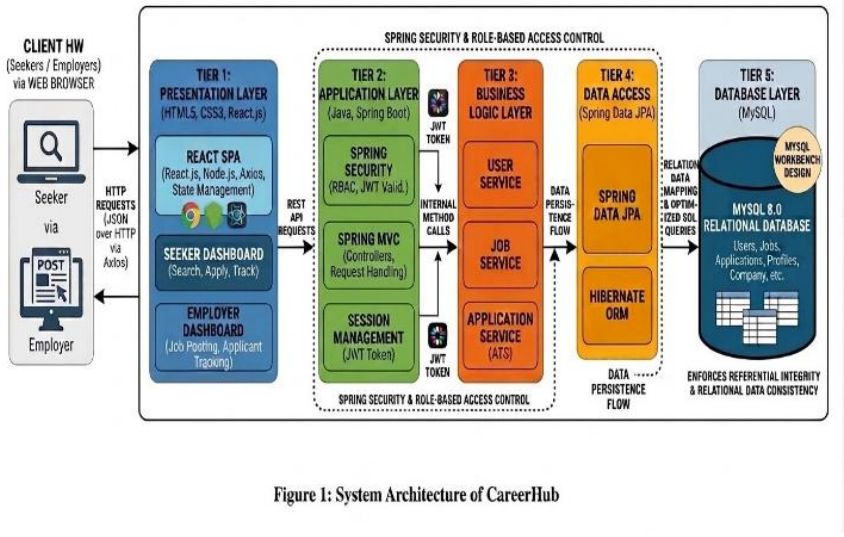

Figure 1: System Architecture of CareerHub

Fig. 1. System Architecture of CodeHub

TABLE I. Five-Tier Architecture

Tier	Layer	Technology
1	Presentation	HTML5, CSS3, React.js
2	Application	Java, Spring Boot, Spring MVC, Spring Security
3	Business Logic	Job Service, User Service, Application Service
4	Data Access	Spring Data JPA, Hibernate
5	Database	MySQL, MySQL Workbench

VI. MODULE DESCRIPTIONS

A. User Authentication & Security Module – O. J. Patil

This module ensures that every user is verified. It utilizes Spring Security integrated with JWT. Passwords are encrypted before being stored in the MySQL database. It strictly enforces role-based access control (RBAC), ensuring that a Job Seeker cannot access Employer-specific API endpoints (like deleting a job posting).

B. Employer & Job Management Module – O. J. Patil

This module provides a dedicated workspace for companies. Employers can draft job descriptions, set application deadlines, and publish postings. All job data is stored relationally in MySQL, linked to the Employer's unique ID, ensuring structured and fast retrieval when candidates query the database.

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C. Job Seeker & Search Module– O. J. Patil

Built for maximum usability, this module allows candidates to search for jobs using keywords, locations, and categories. The React frontend provides instant filtering, while the Spring Boot backend queries the MySQL database using optimized JPA criteria queries to return matching jobs rapidly.

D. Application Tracking Module (ATS) – O. J. Patil

The core operational module of the system. When a seeker applies for a job, an "Application" record is created in the database mapping the Seeker ID to the Job ID. Employers can view a list of these applications, download attached resumes, and update the
application status (e.g.,Pending,Hired, Reject)

VII. IMPLEMENTATION

A. Architecture and Stack

The platform follows a RESTful architecture where the React frontend and Spring Boot backend communicate via JSON over HTTP.

TABLE II. Hardware and Software Specifications

Component	Specification
OS	Windows 10 / Linux
Backend	Java 17, Spring Boot 3.x (REST API)
Frontend	React.js, Node Package Manager (NPM), Axios
Database	MySQL 8.0, MySQL Workbench
IDE / Tools	IntelliJ IDEA, VS Code, Postman
Client HW	Min. 2 GHz CPU, 4 GB RAM
Server HW	8 GB RAM, 50 GB storage
Security	Spring Security, JWT Authentication

B. System and Integration Components

The backend is developed using Spring Boot, which handles all complex business logic and robustly maps data to MySQL using Hibernate ORM. MySQL Workbench was utilized during the development phase to design the Entity-Relationship (ER) diagrams, create normalized tables (Users, Jobs, Applications, Profiles), and write complex analytical queries. The React frontend uses Axios to consume the Spring Boot REST APIs, utilizing state management (like Redux or React Context) to ensure the UI updates instantly when a user applies for a job or logs in.

VIII. SYSTEM ANALYSIS

1) Relational Data Consistency:

By utilizing MySQL as a relational database, the system enforces strict referential integrity. For example, if an Employer deletes a job posting, all associated applications are handled properly (via cascading deletes or status archiving), preventing orphaned data.

2) Secure Role Separation:

Spring Security ensures that API endpoints are heavily protected. This prevents URL manipulation attacks where a candidate might try to forcefully alter their application status.

3) High Performance and Responsiveness:

The separation of the frontend (React) and backend (Spring Boot) allows the client browser to handle UI rendering while the server solely focuses on data processing. This results in a highly responsive platform that feels like a native

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application. Passwords are encrypted before storage, and session handling prevents unauthorized access. The admin module has additional privileges to monitor users and repositories without interfering with normal user operations. This controlled access mechanism ensures data security and prevents misuse of the platform.

Module	Metric	Result
Search Engine	Job query response time	< 1.2 seconds
Application	Submission latency	< 1 second
Dashboard	Load time (Employer)	< 2 seconds
Authentication	Login response & JWT generation	< 800 milliseconds
Database	Complex Join Query execution	Fast, optimized via indexing
Concurrency	Simultaneous active users	100+ users (stable)

TABLE IV. Performance and Evaluation

X. PROJECT TIMELINE

Month	Activity
Dec 2025	Problem definition, requirement gathering, and ER diagram design in MySQL Workbench.
Jan 2026	Backend API development using Spring Boot, Spring Security, and JPA.
Feb 2026	Frontend development using React.js; creating dashboards and forms.
Mar 2026	Integration of REST APIs with frontend via Axios, application lifecycle testing.
Apr 2026	System optimization, final testing, documentation, and project submission.

XI. CONCLUSION

CareerHub successfully demonstrates that the complexities of modern hiring—such as fragmented communication, lack of transparency, and poor data organization—can be effectively resolved through a well-engineered web platform. By utilizing a robust tech stack consisting of React.js, Spring Boot, and MySQL, the system provides a centralized, secure, and highly responsive environment for both job seekers and employers.

The implementation of a relational database managed via MySQL Workbench ensures that user data and application histories are strictly organized and instantly retrievable. The system ensures accurate application tracking, secure role-based access, and efficient job searching. Future enhancements could include integrating machine learning algorithms to auto-match candidate resumes with job descriptions, or adding integrated video-interviewing modules. Overall, CareerHub establishes a strong foundation for a scalable, modern recruitment platform.

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