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INTERNATIONAL JOURNAL OF RECENT TECHNOLOGY SCIENCE & MANAGEMENT

“AN INTELLIGENT JOB-PORTAL FRAMEWORK FOR STUDENT EMPLOYABILITY: MATCHING SKILLS, PREFERENCES AND OPPORTUNITIES”

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ABSTRACT

In this paper, we present the implementation of the Job Portal Service, a web-based application developed to simplify and digitize the recruitment process by offering a dynamic platform for job-seekers and employers. Built using the MERN stack (MongoDB, Express.js, React.js, Node.js), the system allows users to create and manage profiles, post job vacancies, and explore career opportunities with ease, all while delivering a smooth and responsive user experience across devices.

Employers are able to register on the portal, post job openings, and search for candidates using filters based on key skills, experience and qualifications. Secure access is maintained by leveraging role-based access control (RBAC) and JSON Web Token (JWT) authentication, ensuring that only verified users may access and manage relevant data. The backend is structured via RESTful APIs to ensure modularity and efficient data handling between client and server.

The portal further integrates intelligent search functionality through keyword-based filtering and skill-matching algorithms, thereby enhancing the precision of candidate-job matching. Additional features such as resume uploads, real-time notifications and personalized user dashboards contribute to a seamless and intuitive experience. Overall, the system provides a comprehensive and scalable solution for modern recruitment needs.

Key Words: MERN stack, RBAC, JSON Web Token, Job-Portal .

I. INTRODUCTION

With today's competitive job market, finding suitable employment can be especially challenging in developed and skill-intensive sectors. To address this gap, the portal has been developed to provide a streamlined and effective job-searching experience. Through this web-based system, job-seekers are able to upload their resumes and gain access to a wide range of opportunities aligned with their profiles. At the same time, the platform enables companies and employers to locate high-quality candidate resumes and efficiently identify well-profiled individuals.

The online job-portal system to be developed provides members with job listings, online application capabilities, and additional facilities. The system delivers a service to job applicants to search for working opportunities. The portal enables job-providers to establish one-to-one relationships with candidates. It primarily focuses on the posting and management of job vacancies so that ultimately all job openings are posted online and employers are offered the ability to post their vacancies via the web. It helps employers review and manage the resulting applications efficiently through

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a web interface. Employers can also identify resumes matching key skills in a very short amount of time. In the Indian market, there is ample opportunity for job-portal sites due to the increasing number of educated and skilled young people graduating each year. With India's growth rate projected at over 7 percent, this presents a boom time for the corporate sector as well. Consequently, a growing number of lucrative career opportunities are becoming available to job-seekers. It is therefore an opportune period for job-portal platforms to think out of the box and make the most of the opportunities available.

II. LITERATURE REVIEW

In recent years, recruitment and job-portal research has grown significantly, reflecting the shift from traditional hiring practices toward digital platforms and algorithmic matching. Below we review key themes relevant to our job portal model.

1. Shift from Traditional to Online Recruitment

A systematic review by Kanagavalli G. et al. (2019) found that organisations are increasingly adopting technologies such as online recruitment portals, outsourcing, job-fairs, campus interviews and mobile recruitment applications. Their review of 40 articles (2010-2018) revealed that digital recruitment is not merely a novelty but is rapidly becoming a strategic staffing tool. In the Indian context, a study on portal adoption in Kolkata found that while awareness of e-recruitment portals is high, usage varied significantly by age and education level. These findings illustrate the importance of system design and user experience in digital recruitment platforms.

2. Features, Challenges and Effectiveness of Online Job Portals

In the Indian domain, Prabandhan: Indian Journal of Management published a comparative study of leading portals from the viewpoint of recruitment consultants. This study found operational difficulties such as high per-click cost, niche-profile non-availability, difficulties in capturing correct keywords and incomplete candidate details. On the algorithmic side, a survey by Yoosof Mashayekhi et al. on e-recruitment recommendation systems identified key challenges such as data sparsity, relevance, candidate-job matching accuracy, and the need for hybrid filtering approaches. Further, Maree et al. (2020) reviewed the shortcomings in existing e-recruitment systems—particularly knowledge incompleteness and limited domain coverage in matching skills and resumes. These works highlight that while portals bring many benefits (reach, speed, cost-efficiency), they also raise issues like algorithmic bias, match precision, and user data quality.

3. Indian Market and User-Perspective Studies

The Indian market offers unique conditions: young population, growing digital literacy, rising internet/smart-phone penetration and a fast-growing economy. A study noted more than 65% of India's population is below 35 years, which impacts the job-seekers' behaviour and choice of online portals.

Many Indian studies find that job-seekers perceive e-recruitment portals as more time-efficient, cost-effective and convenient versus traditional methods. For example, in one study, 85% of respondents used job-portals and career websites to search jobs. However, studies also emphasise that portal usability, relevance of search filters, user interface, feedback from recruiters, and trust/security remain important barriers.

4. Implications for Portal Design and Matching Algorithms

From the literature, several design implications emerge for advanced job-portal models:

Use of fine-grained filters and skill-matching algorithms to improve relevance and reduce mismatches (see Maree et al.). Incorporation of recommendation systems to suggest job-seekers to recruiters and vice-versa (Mashayekhi et al.). Ensuring usability, mobile-responsiveness, and clear candidate profiles. Addressing data quality (complete profiles, correct keywords), algorithmic fairness & transparency (Indian comparative portal study). Leveraging digital growth in markets such as India: young workforce, online adoption, demands for scalable portals.

5. Gaps in the Literature

Despite extensive work, the literature still shows gaps that your project of the "Job Portal Service" can address:

Many studies cover portal adoption and features, but fewer examine skill-matching algorithms in Indian job-portal contexts at scale. Limited work on mobile-first job-portals and responsive UX for emerging-market job-seekers. There is a need for frameworks that integrate profile parsing, semantic matching, real-time notifications, and user dashboards, especially tailored for student and early-career job-seekers. Relative scarcity of longitudinal studies tracking user satisfaction and placement outcomes post-portal usage in India.

III. PROBLEM ANALYSIS

Although numerous online job-portals exist, many struggle with low match accuracy, high volumes of irrelevant applications, poor user experience, and weak engagement from job-seekers and employers alike. These issues are amplified in rapidly growing markets such as India, where variability in skills, digital access and standardization present additional hurdles. There is thus a need for a comprehensive, scalable, user-centric job-portal platform that efficiently matches job-seekers with employers, offers a seamless experience for both, and is adapted to the context of modern recruitment demands

IV. IMPLEMENTATION

Technical feasibility assesses whether the required technology, software, hardware, and infrastructure are available and suitable for developing the system. For our web-based job-portal system (built using the MERN stack: MongoDB, Express.js, React.js, Node.js), the key technical considerations are:

Ensuring that server-client interactions (REST-APIs, page rendering) can deliver a responsive, efficient experience (i.e., pages render within acceptable loading time).

Verifying that the necessary development tools, libraries, and runtime environments are available and the development team has the required skills.

Ensuring that the system will scale (handle increasing number of users, job postings, resume uploads) without major performance degradation.

In our case, because we are leveraging modern web technologies and avoiding excessive logic in the “page load” event (to reduce client-side delay), the project can be considered technically feasible.

Economic feasibility analyses the cost-benefit aspects of the proposed system—whether the anticipated benefits outweigh the costs and whether the investment is justifiable.

Costs include development (software engineering, UI/UX design, testing), infrastructure (servers, hosting, data storage), maintenance, and ongoing support.

Benefits include reduced acquisition cost for employers (faster candidate matching), increased job-seeker reach, improved operational efficiency, potentially monetizable features (premium listings, subscriptions) and long-term scalability.

Since the portal is cost-effective in nature—with relatively modest infrastructure requirements compared to more complex systems—and the intangible costs are minimal, the economic feasibility is favorable.

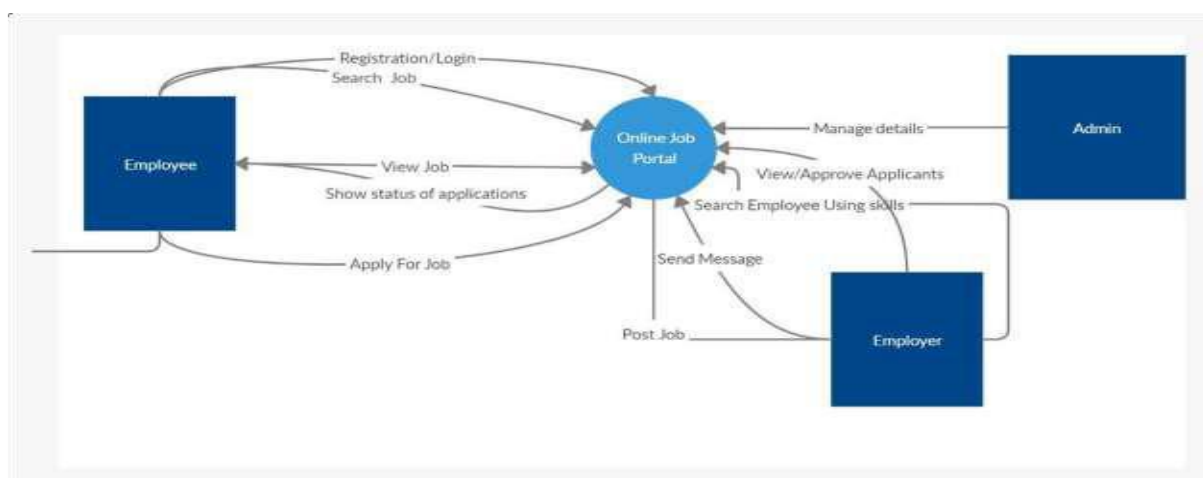


Figure 1: Diagram of Placement Portal

Data Flow Diagram (DFD) for the proposed Job Portal System illustrates the key processes, data stores, and data flow interactions among various entities. It decomposes the main functions of the system into several interrelated processes to show how data moves within the system.

User Registration and Authentication

This process allows both job seekers and employers to register and log into the system. The system verifies user credentials and, upon successful authentication, creates a unique user profile. All registration and authentication data are stored in the User Database.

Job Posting and Management

Employers can create, edit, and delete job postings through this process. Each posting is verified and stored in the Job Database. Job seekers can access these postings and search for opportunities using multiple filters such as location, skill set, or job category.

Application Processing

Job seekers can apply for positions of interest. The system records each application, validates the information, and stores it in the Application Database. Employers are notified automatically when a new application is submitted.

Resume Management

Job seekers can upload, update, or delete their resumes. The system ensures that employers can access the most recent version of each candidate's resume when reviewing applications. These resumes are stored in the Resume Database.

Notifications and Alerts

The system generates automated notifications for users. These include job recommendations, application status updates, interview schedules, and other relevant alerts. Notifications ensure continuous engagement between job seekers and employers.

Admin Management

The administrator oversees the overall functionality of the portal. This includes approving user accounts, monitoring job listings, managing databases, resolving user queries, and generating analytical reports related to placement activities and portal usage.

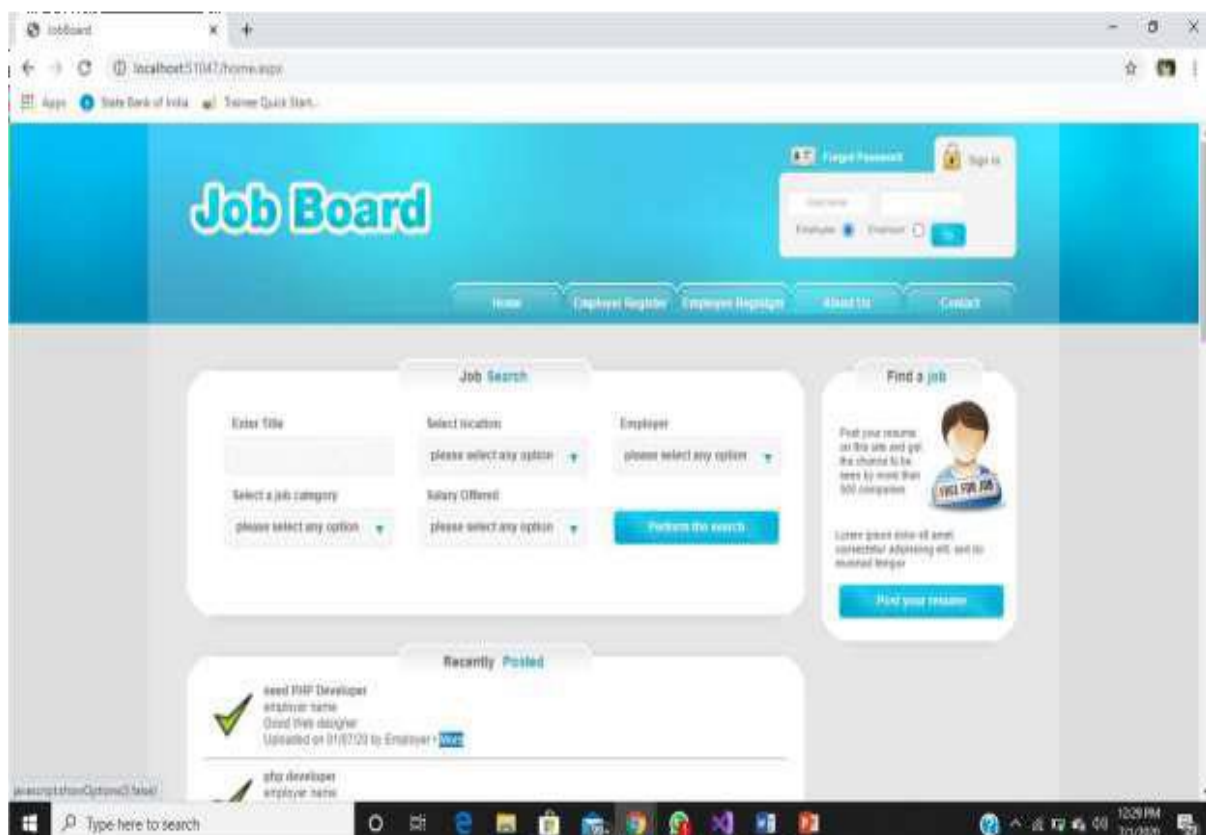


Figure 2 -Homepage I Implementation

V. CONCLUSION

In conclusion, this project has been a transformative experience that significantly enhanced both my technical skills—particularly in building a web-based job portal using → ASP.NET, SQL Server and client-server architecture—and my personal growth in areas like planning, teamwork and problem-solving. It provided practical exposure to key features such as user authentication, job postings, resume management and employer-candidate interactions. These experiences have established a solid foundation for my future career in software development and prepared me to take on more complex projects with confidence.

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