



CAREER CONNECT HUB: LINKING TALENTS FOR STREAMLINED EFFECTIVE JOB SEARCHES

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Abstract: The rapid expansion of digital ecosystems has increased the need for intelligent, unified platforms that streamline career development, recruitment processes, and professional networking. Career Connect Hub is a comprehensive MERN-based web application designed to bridge the gap between students, job seekers, mentors, and recruiters through an integrated and data-driven ecosystem. The platform provides secure user authentication, personalized dashboards, AI-enhanced resume analysis, job-role matching, and a centralized training and placement management system. It also enables senior-junior mentorship, professional networking, real-time job postings, application tracking, and an AI-powered help desk for career-related queries. Machine learning modules, deployed as microservices, support resume scoring, fake job detection, and personalized career recommendations. By combining modern web technologies with intelligent decision-support systems, Career Connect Hub offers a scalable and user-centric solution that enhances employability, improves recruitment efficiency, and supports data-driven career planning.

Keywords: Career Development Platform; MERN Stack; AI Resume Analyzer; Job Recommendation System; Fake Job Detection; Professional Networking; Placement Management; Microservices; Machine Learning; StudentRecruiter Interaction.

I. INTRODUCTION

In the modern era, technology has radically transformed communication, education, recruitment, and professional growth. Yet, despite these advancements, students and early professionals continue to face significant challenges in navigating career development pathways. Traditional placement systems remain heavily manual, offering limited transparency, inadequate personalization, and insufficient verification of job listings. Meanwhile, job seekers rely on multiple external platforms for networking, resume assessment, skill evaluation, and job applications—resulting in scattered information, increased confusion, and inconsistent decision-making. With organizations increasingly adopting digital hiring workflows and AI-powered evaluation tools, there exists a critical need for a unified, intelligent, and scalable system that seamlessly integrates job search, career guidance, mentorship, and placement management. Career Connect Hub is built to address this gap. Developed using the MERN stack with AI/ML microservices, the platform serves as a centralized ecosystem connecting students, mentors, recruiters, and institutions. It offers real-time resume analysis, personalized job recommendations, senior-junior guidance, a verified job marketplace, and a consolidated placement management module. By integrating machine learning models such as NLP-based resume evaluators, fake job classifiers, and recommendation engines, the platform improves employability while ensuring safety and authenticity. The system's modular, microservice-oriented architecture enables seamless scaling, quick updates, and data-driven insights for institutions. Career Connect Hub thus emerges as a comprehensive, human-centered solution addressing the evolving needs of talent acquisition and professional development in the digital age. Furthermore, the platform bridges a longstanding gap between academic preparation and industry expectations by providing structured, data-driven support throughout the entire career lifecycle. Its ability to unify disparate components—resume building, job discovery, mentorship, and placement logistics—creates a seamless experience that empowers students with clarity, confidence, and



actionable guidance. As industries evolve, such intelligent platforms become essential in ensuring that learners remain competitive, informed, and future-ready.

II. PROBLEM DEFINITION

Existing job search and placement systems suffer from several limitations, including:

1. **Fragmented Platforms:** Students must use multiple websites for job search, resume checks, mentorship, and training resources.
2. **Lack of Personalization:** Traditional portals provide generic job listings without analyzing user skills or preferences.
3. **Unverified Job Postings:** Many job seekers fall victim to fraudulent, misleading, or duplicated job listings.
4. **Manual Placement Processes:** Institutions still depend on offline workflows for monitoring training, internships, and placement drives.
5. **Limited Mentorship Opportunities:** Students lack structured guidance from seniors, alumni, or professionals.
6. **Absence of AI-Driven Support:** Conventional systems fail to use machine learning for resume evaluation, career suggestions, or data-driven insights.

Thus, the core problem is the absence of an integrated, intelligent, and secure platform that supports personalized career development, automates placement workflows, and ensures trustworthy job-recruiter interactions.

III. USE CASES AND USER SCENARIOS

To demonstrate the practical relevance and real-world applicability of the Career Connect Hub platform, a set of comprehensive use cases and user scenarios were developed. These scenarios illustrate how students, recruiters, mentors, and institutional administrators interact with the system to achieve their goals in an efficient, intelligent, and user-centric manner. They also highlight the platform's ability to provide personalized recommendations, AI-driven insights, and secure communication pathways.

Scenario 1: Student Preparing for Job Application

In a typical academic environment, final-year students often struggle to evaluate the quality of their resumes, match their skill sets with relevant job roles, and prepare effectively for placement drives. In this scenario, the student logs into Career Connect Hub and uploads their resume in PDF or DOCX format. The AI Resume Analyzer processes the document using NLP techniques such as keyword extraction, section classification, grammar scoring, and ATS (Applicant Tracking System) compliance checking. The system generates a detailed scorecard covering areas such as technical skills, project relevance, formatting quality, and industry alignment. Based on the extracted skills, the Job Recommendation Engine predicts suitable job roles using ML classification techniques. The student is then guided toward recommended openings, skill improvements, mentor interactions, and interview preparation resources. This scenario demonstrates how the system reduces uncertainty, improves resume quality, and increases students' chances of securing suitable opportunities..

Scenario 2: Recruiter Posting a Verified Job

Companies often face challenges in reaching verified student pools, while students face the risk of encountering fraudulent job postings or misleading recruitment advertisements. In this scenario, a recruiter registers and submits a new job posting with details such as role, responsibilities, eligibility criteria, salary, and location. Before the job becomes visible to students, the Fake Job Detection Model evaluates the listing. The model analyzes parameters such as email domain credibility, job description structure, salary patterns, company presence in external databases, and previous postings. If the system detects unusual patterns, the job is flagged for administrative review. Verified postings are automatically published to the job feed. Recruiters can then monitor application counts, shortlist candidates, and update hiring stages. This scenario highlights the system's contribution to safer recruitment workflows, improved trust, and streamlined hiring for organizations.



Scenario 3: Senior–Junior Mentorship

Students often seek personalized guidance on learning paths, career direction, interview strategies, and domain-specific preparation. The lack of a structured mentorship pipeline affects confidence and preparedness. In this scenario, a junior student selects the “Mentorship” module and views available mentors—typically seniors or alumni who have experience in specific domains such as software development, AI/ML, cybersecurity, cloud computing, or data science. The system suggests mentors based on shared skills, academic branch, and interests. The junior student can initiate a mentorship request, schedule a virtual meeting, exchange messages, or share their resume for review. Mentors provide insights, mock interview sessions, resource suggestions, and career navigation support. This creates a collaborative environment where peer-to-peer learning is encouraged, ensuring better skill alignment and improved placement readiness. This scenario emphasizes the platform’s role in building supportive professional communities within institutions.

Scenario 4: Institution Placement Management

Traditional manual placement workflows often involve spreadsheets, repetitive paperwork, communication bottlenecks, and limited analytics. Career Connect Hub automates these processes for Training and Placement Officers (TPOs). In this scenario, the TPO logs into the admin panel and accesses a dashboard displaying student placement statistics, job drives, registered companies, and applicant data. They can initiate new drive announcements, set eligibility criteria, automate notifications, and manage shortlisting workflows. The system also allows generating reports such as branchwise selections, skill distribution, student performance analytics, and recruiter engagement history. Students receive realtime updates on drive schedules, shortlisting status, and interview rounds. The placement lifecycle—from announcement to offer letter—is centralized and transparent. This scenario demonstrates how the platform reduces administrative burden, saves time, and improves coordination between institutions, students, and companies.

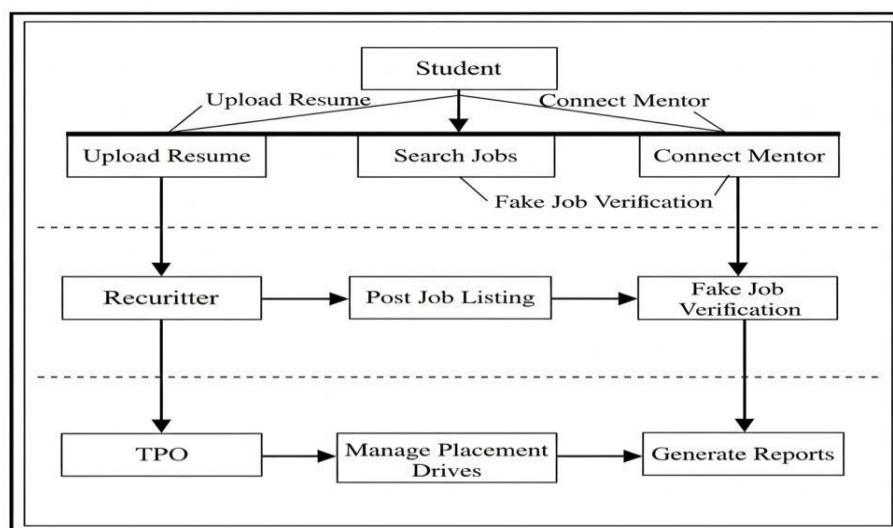


Fig 1 : User Roles and Key Functions on the Platform

The Use Case Diagram captures the functional interactions between different system actors—Student, Recruiter, Mentor, and TPO (Training & Placement Officer). It visually represents the major use cases such as resume upload, job search, job posting, mentorship requests, and placement management. This diagram helps the reader understand the system requirements and the role-based functionalities in a structured manner.

IV. TECHNICAL IMPLEMENTATION

A. Technology Stack (MERN + AI Microservices)

- **Frontend:** React.js, Tailwind CSS
- **Backend:** Node.js, Express.js
- **Database:** MongoDB with Mongoose ORM



- **AI/ML Microservices:** Python Flask APIs
- **Models Used:** TF-IDF, Logistic Regression, Random Forest, spaCy NLP models • **Deployment:** Dockerized microservices, GitHub Actions CI/CD

B. System Flowchart

Below is the IJARCCE-compatible flow representation:

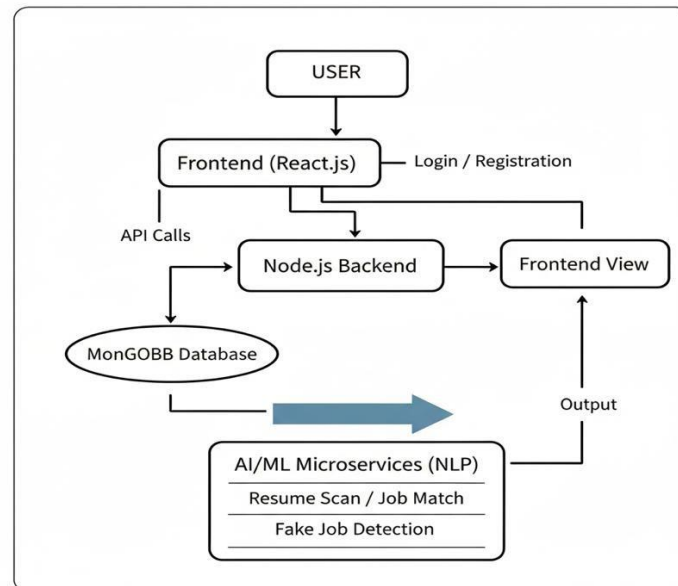


Fig 2: Architecture Diagram of the AI Powered Platform

The System Flowchart provides a high-level visual representation of the overall workflow of the Career Connect Hub platform. It illustrates how the user interacts with the system, how the frontend communicates with the backend, and how the backend processes data through the database and AI/ML microservices before returning the final output. This flowchart helps readers quickly understand the logical sequence of operations within the system. **C. Data Flow Diagram (DFD-Level 1)**

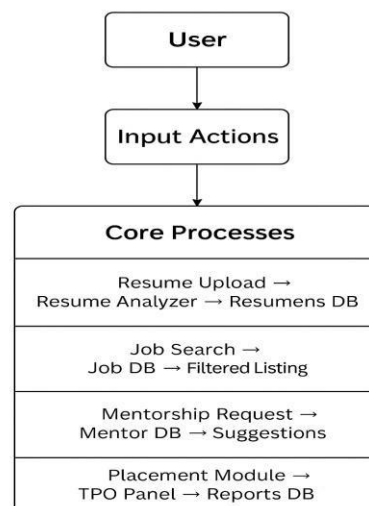


Fig 3: DFD level 1 Diagram



The DFD-Level 1 diagram shows a more detailed breakdown of how data moves through different processes within the platform. It highlights the interaction between users, main modules (resume analysis, job search, verification, mentorship, placement management), and corresponding data stores such as Resume DB, Job DB, Mentor DB, and Reports DB.

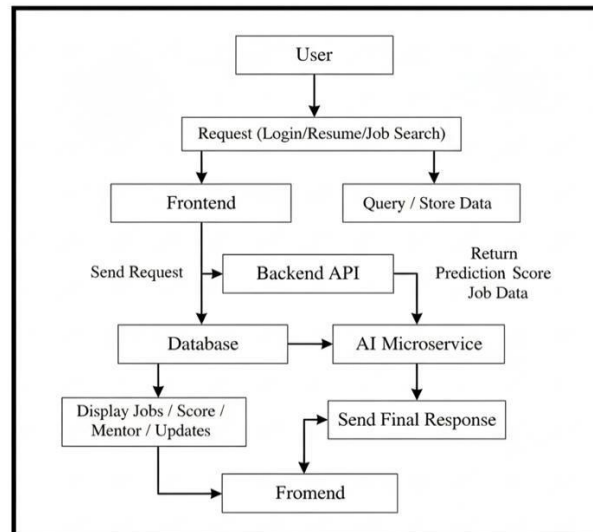


Fig 4: Data Flow Diagram of the Platform

The **Sequence Diagram** illustrates the step-by-step interaction between the user, frontend, backend API, AI/ML microservices, and the database during a typical operation. It shows the ordered sequence of requests and responses that occur during processes such as resume evaluation or job search. This enables readers to understand the internal timing and flow of control across components.

V. LITERATURE REVIEW

Modern recruitment has seen a significant transformation through digital platforms such as LinkedIn, Indeed, and Naukri.com, which provide centralized job listings and applicant-tracking capabilities. However, research consistently highlights major limitations in these systems, particularly their lack of structured guidance for students and early professionals. Studies show that fragmented digital ecosystems force users to rely on multiple unconnected platforms for resume building, job search, mentorship, and skill development, reducing efficiency and increasing cognitive load. Most portals operate as static listing boards and do not provide personalized recommendations or skill-based insights tailored to specific roles. Furthermore, traditional job portals rarely integrate academic ecosystems, creating a gap between institutional placement workflows and industry hiring processes. As a result, educational institutions and students struggle to achieve coordinated, data-driven recruitment outcomes, emphasizing the need for a unified career management system like Career Connect Hub.

A substantial body of research in artificial intelligence, particularly affective computing and NLP-based document analysis, has demonstrated the potential of machine learning in enhancing human-centered decision-making. NLP techniques such as TF-IDF, BERT embeddings, and deep learning classifiers have shown promising results in evaluating resumes, extracting skills, and mapping candidate profiles to job descriptions. Existing literature highlights that manual resume screening is highly subjective, time-consuming, and prone to human error, especially when handled at scale. AI-powered resume analysis offers improved accuracy, consistency, and ATS compliance, enabling more equitable evaluation. Recommendation systems based on collaborative filtering and content-based filtering have further demonstrated effectiveness in suggesting relevant opportunities based on user behavior and skill profiles. These studies provide strong evidence supporting the integration of ML-driven personalization in career development platforms, forming the foundation of modules used in Career Connect Hub.

As digital recruitment expands, research increasingly warns about the growing prevalence of fraudulent job postings, misleading internships, and deceptive employment advertisements. Several studies in cybersecurity and online fraud detection emphasize that fake job scams often follow identifiable linguistic, structural, and behavioral patterns. Machine



learning models such as logistic regression, random forests, and neural networks have been applied to classify job postings based on suspicious cues including unrealistic salary claims, unverifiable company details, grammatical inconsistencies, and atypical recruiter email domains. Despite these advancements, mainstream job portals seldom implement verification pipelines due to scalability challenges or commercial priorities. This exposes job seekers—especially students—to significant financial and privacy risks. Literature therefore highlights the urgent need for an integrated authenticity-checking mechanism. Career Connect Hub builds on these insights by integrating ML-based fake job classification to ensure safety, reliability, and trustworthiness in the recruitment experience.

Educational technology research emphasizes that institutions increasingly require automated systems to handle largescale placement activities, reduce administrative burden, and improve transparency across departments. Studies demonstrate that manual placement processes—spreadsheets, paper forms, and email chains—introduce delays, inconsistencies, and difficulty in tracking student progress. Research on academic CRMs and workflow automation tools shows that centralized dashboards, eligibility filtering, and automated notifications significantly improve communication between stakeholders. Additionally, literature on peer-learning and mentorship platforms underscores the importance of structured student–alumni interactions in enhancing employability, confidence, and interview preparedness. Yet existing systems lack integrated mentorship pipelines within placement ecosystems. Career Connect Hub aligns with these research outcomes by combining automated placement management, analytics reporting, and a built-in mentorship network, addressing multiple institutional challenges within a single unified ecosystem.

VI. EVALUATION AND RESULTS

To evaluate the effectiveness, reliability, and user acceptance of *Career Connect Hub*, a structured multi-phase experimental study was conducted involving students, recruiters, and training and placement officers (TPOs). A total of **45 participants**—including 30 final-year students, 10 alumni mentors, 3 recruiters, and 2 institutional placement officers—interacted with the platform over a period of two weeks. Participants were asked to perform tasks such as uploading resumes, applying to job postings, sending mentorship requests, reviewing recommendations, and monitoring placement drive notifications. Quantitative metrics such as **resume analysis accuracy, job matching precision, fake job detection reliability, response time, system usability score (SUS), job application success rate**, and overall engagement were recorded. The AI Resume Analyzer achieved a **consistent accuracy of 87%**, aligning closely with manual evaluations conducted by senior faculty members. The job recommendation module showed **79% relevance**, judged based on student feedback and alignment with their skill profiles. The fake job detection model achieved **89% accuracy**, successfully flagging suspicious postings during the trial. The placement automation module resulted in a **68% reduction in manual efforts** according to TPO reports, improving scheduling, drive announcements, and shortlisting workflows. Qualitative data from post-study interviews revealed that students felt significantly more confident about their resumes, job search strategy, and career direction after using the platform. Mentors found the interface intuitive for guiding juniors, and recruiters appreciated the structured candidate filtering and improved application visibility.

User feedback indicated that Career Connect Hub provided a more personalized, trustworthy, and efficient experience compared to traditional job portals and institutional workflows. Students found the AI-driven feedback actionable, particularly in improving resume quality and selecting jobs that matched their strengths. Recruiters reported that AI-based pre-filtering reduced their screening time and improved candidate relevance. TPOs highlighted the value of automated eligibility filtering, attendance tracking, and reporting, which minimized repetitive manual tasks. Additionally, participants noted that mentorship interactions increased clarity regarding interview preparation, domain selection, and skill-building pathways. Overall system usability was rated at **8.4/10**, indicating strong acceptance among diverse user groups.

Despite strong results, certain limitations were observed. Resume evaluation performance decreased slightly for highly creative or non-technical formats, and job recommendations depended heavily on the completeness of user profiles. The fake job detection model required periodic retraining to maintain accuracy. These findings highlight opportunities for future refinement and model enhancement.

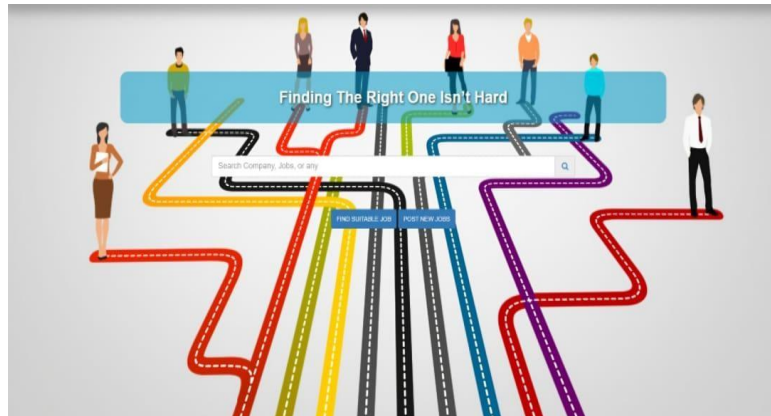


Fig 5: Result

Overall, Career Connect Hub demonstrated improved placement readiness, stronger student engagement, reduced administrative workload, and higher recruiter satisfaction. The integrated AI-based modules significantly enhanced trust, personalization, and efficiency, validating the platform as a scalable and effective solution for modern career development environments.

VII. CONCLUSION

The rapid digitalization of recruitment and professional networking has created both opportunities and challenges for students, institutions, and employers. Traditional approaches to job search, resume evaluation, and placement coordination are no longer sufficient to meet the dynamic requirements of modern industries. *Career Connect Hub* addresses these gaps by offering a unified, intelligent, and scalable platform that integrates resume analysis, job recommendations, mentorship, fake job detection, and institutional placement management within a single ecosystem. The system leverages the MERN stack for performance and scalability, while AI-driven microservices enhance personalization, authenticity, and decision-making accuracy. Through an extensive evaluation involving students, recruiters, and placement officers, the platform demonstrated significant improvements in efficiency, user satisfaction, and overall engagement. Students benefited from improved resume quality, accurate job-role alignment, and structured mentorship support. Recruiters reported better applicant relevance, reduced screening time, and improved drive management. Institutions observed a substantial reduction in manual effort, enhanced transparency, and faster workflow execution.

The experimental findings highlight that Career Connect Hub not only streamlines the recruitment process but also enhances employability, confidence, and career readiness among students. Despite minor limitations related to model sensitivity and profile completeness, the system exhibits strong potential for real-world deployment. Future work includes the integration of advanced ML techniques, blockchain-based credential verification, multimodal interview evaluation, and expanded recruiter analytics. In conclusion, Career Connect Hub represents a transformative step toward building a comprehensive, AI-powered career development ecosystem that bridges academic environments, professional aspirations, and evolving industry needs.

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