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An Intelligent Web-Based Platform for Placement Management Driven by Students and Faculty

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Abstract- **An powered by AI placement cell system that automates and improves the campus hiring process is presented in this research. For academics and students, the system provides role-based access, making it possible to manage resumes, job advertising, and application analysis with ease. The incorporation of an AI model (LLaMA), which dynamically matches student talents with employment requirements and extracts pertinent information from student resumes, is a crucial component. Resumes are saved in a binary state and only analyzed during login, in contrast to traditional systems, protecting data privacy while preserving performance. For the purpose of making hiring decisions, faculty users can create downloadable reports and assess skill compatibility. This system functions as an exhaustive instrument for automating the placement workflow in academic institutions, minimizes human workload, and maximizes candidate-job matching.**

Key words: ***AI in Placement, Resume Parsing, Web-Based Placement System, LLaMA Model, Campus Recruitment, Role-Based Dashboard, Skill Matching, Student Resume Analysis.***

1. INTRODUCTION

Campus recruitment is a crucial stage in students academic careers, and educational institutions face several difficulties in effectively handling it. Conventional placement procedures, which include gathering resumes in person, shortlisting them, and coordinating with instructors and students, are frequently laborious, time- consuming, and prone to errors. Systems that can automate these processes and offer useful insights are becoming more and more necessary as web technologies and artificial intelligence develop. This study presents a clever web-based framework designed to automate and integrate AI to expedite the placement process. By facilitating automated resume processing, AI-driven job matchmaking, and central accessibility for both academics and students, the suggested system overcomes the drawbacks of traditional approaches.

2. LITERATURE SURVEY

Recent research has focused heavily on the use of digital technologies to transform placement systems. A study developed a computer-human interface layout for a placement management system with the goal of streamlining user interaction and improving overall experience [1]. This system offers improved processes and organized modules to help both students and administrators with placement-related tasks.

Deep learning techniques are routinely used to forecast student placement results. One study used numerous deep learning models to predict the placement of an individual based on educational institutions, demographic, and related to skill data [2]. The models predicted with great accuracy, proving the possibility of intelligent forecasting techniques.

An integrated, a web-based platform was developed to enhance placement coordination and student interaction in academic institutions [3]. This platform aimed to digitize every stage of the placement process, from registration for students to employer collaboration and interview tracking, providing a standardized and flexible method for placement management.

Using historical data, a data mining approach was created to forecast individual overall institutional placement percentages [4]. The study used machine learning as well as statistical tools to generate insights and illustrate placement trends, allowing educational institutions to make data-driven decisions.

Another study presented an automated personnel recruitment management system based on artificial intelligence [5]. The technology enabled robotic candidate choosing, resume analysis, and ranking based on job descriptions, minimizing manual work and shortening recruitment times.

Another placement prediction approach used machine learning to identify students based on their chance of placement, utilizing features such as CGPA, knowledge of technology, and extracurricular engagement [6]. The

study found that statistical techniques, particularly ensemble models, were useful in estimating placement probability.

A study on student placements for internships examined ways to improve the value of internship programs in the study of engineering [7]. The study emphasized systematic coordination, industry-academic cooperation and and effective monitoring of student development throughout internships. Effective feedback and constant monitoring are crucial for internship success.

3. OBJECTIVE AND MOTIVATION

This project's main goal is to do away with the delays and inefficiencies that come with using conventional campus placement methods. Faculty personnel at the majority of universities manually gather, examine, and shortlist student resumes for a variety of positions. In addition to taking a lot of time, this procedure does not have a consistent way to assess students' fit for particular job profiles. Additionally, it can be time-consuming and prone to errors for students to fill out their profiles by hand.

By implementing intelligent automation at crucial points in the hiring process, the Placement Cell System seeks to address these issues. The main goal is to create a system that automatically extracts pertinent information from student resumes, including name, location, talents, and education, using artificial intelligence. The system may evaluate these abilities and compare them to the specifications of faculty-uploaded job descriptions by incorporating the LLaMA model. With distinct features and interfaces catered to individual requirements, the system also guarantees role-based access control for instructors and students.

In addition to automation, the system offers features like real-time resume parsing without saving extracted data in the database, downloadable analysis results in CSV format, and a clear, responsive online interface that enhance overall usability and transparency. In addition to digitizing the hiring process, the goal is to improve decision-making, decrease manual work, and make the placement process more intelligent, dependable, and quick.

4. METHODOLOGY

The system was developed utilizing a modular, full-stack web building methodology with MongoDB as the database, Node.js and Express.js for the backend, and React.js for the frontend. Teachers and students use different login sites to access the system.

Students submit their resumes when they register, and the database stores them as binary data in PDF format. The resume is retrieved from a database and instantly parsed utilizing PDF parsing tools when students log in. The LLaMA language model receives the extracted text and returns structured data like name, email, location, and skills. Without storing the parsed information in the database, this data is subsequently used to dynamically fill the student's profile on the frontend.

A special faculty code that verifies their position is used by faculty users to register. By providing employment specifics, such as necessary skills, they can publish new job openings. These job openings are displayed in a special area where academics can review each one. When the "Analyze" button is clicked, the system uses the LLaMA model to compare the parsed skills from all student resumes with the skills needed for the position. Faculty can clearly see which candidates are the best fit thanks to the calculation and sorting of match percentages in ascending order. For offline reference, a CSV file containing the analysis can also be downloaded.

Through RESTful APIs, the system guarantees secure data processing, real-time interactions, and smooth frontend-backend communication. Below is the workflow of the application.

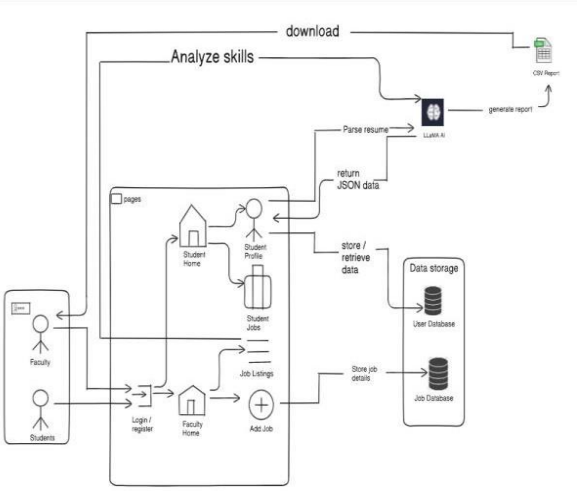

Fig 1: System Overview

4.1 Algorithm Used

The LLaMA (Large Language Model Meta AI) model powers the fundamental AI features. The algorithm operates in the subsequent stages:

- Resume Parsing: A parser (such as pdf-parse) is used to extract text from the uploaded resume PDF.
- Text Analysis: The LLaMA model receives the extracted material, processes it, and extracts pertinent fields like name, location, contact information, education, and skills.

- Skill Matching: The student's extracted skill set is compared to the necessary skills for each job posting.

  To assess appropriateness, the overlap % is calculated.

- Sorting of Results: To facilitate evaluation and decision-making, the results are sorted by match percentage.

In addition to improving student-job matching accuracy and doing away with manual evaluation, this AI-driven process is scalable and flexible enough to accommodate various job profiles.

4.2 Implementation Details

A full-stack online application, the Placement Cell System facilitates smooth communication between instructors and students. React.js is used in the development of the frontend, which offers a role-based and dynamic user experience. The backend, which was constructed using Node.js and Express.js, uses RESTful APIs to manage data routing, resume uploads, job postings, and authentication. The database is MongoDB, which stores resumes and user credentials in a binary format (ArrayBuffer).

A student submits their resume in PDF format when they register. This resume's text is not extracted or stored; instead, it is safely kept in the database. Following a student's login, the backend retrieves the binary data, uses a PDF parser to transform it into legible text, and then transmits it to the LLaMA AI model. The student's profile is shown in real-time on the frontend once the model processes the data and produces structured JSON with personal information and competencies.

During registration, faculty users' access is verified with a pre-established faculty code. Faculty can add new job listings with pertinent information, like necessary abilities, after logging in. Faculty can initiate analysis for each of these positions, which are displayed in a panel of job listings. The system determines a match percentage for each student after comparing the parsed student skills with the needed abilities using LLaMA when the "Analyze" button is clicked. In order to assist faculty in making data- driven judgments when shortlisting candidates, the findings are sorted and supplied in a downloadable CSV format.

To guarantee a seamless user experience, role-based navigation, variable side generating, secure session management, and real-time data fetching are all handled effectively. Future expansion and scalability are also made simple by the system's modular design.

5. RESULTS

The findings of the intelligent web-based placement management system show that AI-driven elements that improve the placement process for professors and students have been successfully integrated. The overall placing process was enhanced by the LLaMA model's promising accuracy in analyzing student resumes and matching them with pertinent job advertisements. Additionally, the faculty and student role- based dashboards showed smooth communication, enabling faculty to post job openings and evaluate skill matches while students uploaded resumes, applied for positions, and tracked their applications.

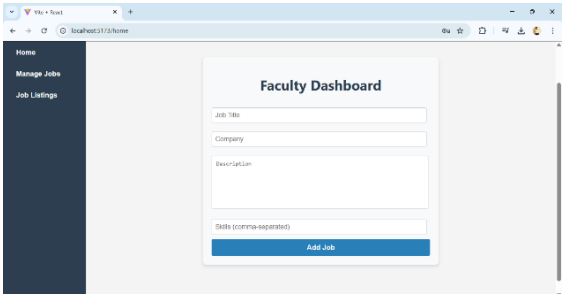

Fig 5.1 Facutly view to add jobs

After registering using a secure faculty code, users gain access to a personalized dashboard (Figure 5.1), which includes features such as Home, Add Job, and Job Listings. Faculty members can post job opportunities.

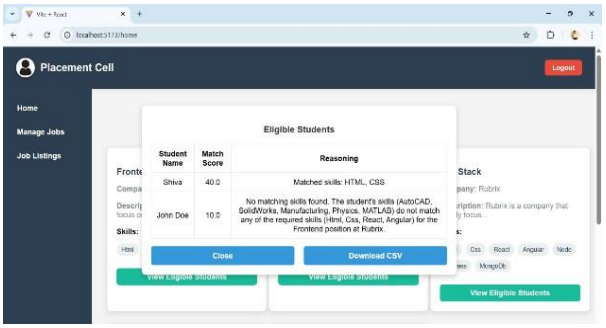

Fig 5.2 Faculty view to download eligible student list

Examine every listing that has been added in the past using a structured interface (Figure 5.2). The AI-based resume analysis utilizing the LLaMA model, which creates accurate skill match percentages by comparing student talents with job requirements, is a crucial feature. Faculty members can also download these analytical findings as CSV reports, which enables offline evaluation and better hiring decisions.

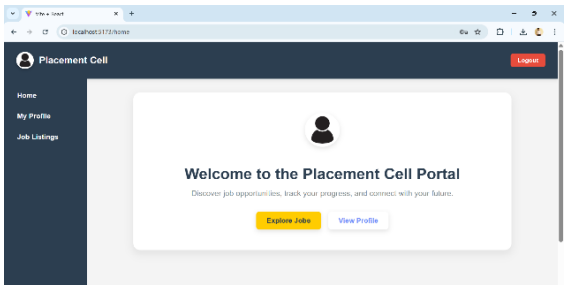

Fig 5.3 Student view

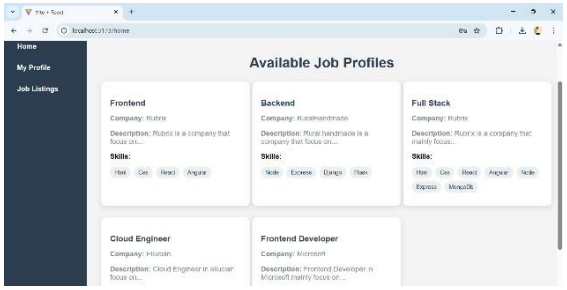

Fig 5.4 Displays available jobs to students

Students are greeted by a tidy dashboard (Figure 5.3) when they log in, which allows them to read their profile, apply for jobs, and investigate employment openings. Using real-time parsing with the LLaMA model, the Profile section is dynamically created from the student's uploaded resume. Students are shown the available job area (Figure 5.4).

6. CONCLUSION

An inventive and perceptive method of overseeing the campus hiring procedure is provided by the powered by AI Placement Cell System described in this research. The solution effectively automates resume processing, allows for real-time student profile development, and supports data- driven choices through AI-based talent matching by fusing artificial intelligence with contemporary online technologies. By eliminating the storage of resume material that has been removed, the role-based architecture preserves data privacy while guaranteeing a customized experience for both professors and students. The time and effort required to shortlist candidates is greatly decreased since faculty members are equipped with the means to evaluate applicants' suitability and obtain organized reports. The solution offers a scalable foundation that can be adjusted to changing recruitment needs in addition to improving operational efficiency. This study lays the groundwork for future smarter, more transparent placement algorithms while showcasing the useful effects of AI in educational institutions.

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