

Smart TPO Placement Management and Notification System

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Abstract - Campus recruitment is an essential process in educational institutions that connects students with potential employment opportunities. However, in many institutions the eligibility screening process is still carried out manually by Training and Placement Officers (TPOs), which requires significant time and effort. Manual verification of student records against job requirements often leads to delays, errors, and inefficient communication with eligible candidates. To address these challenges, this research proposes a Smart Placement Eligibility and Notification System that automates the process of matching student profiles with job requirements. The system stores student academic information such as branch, CGPA, backlog status, and technical skills, along with job criteria provided by companies. An automated eligibility engine evaluates student profiles dynamically and identifies candidates who meet the required conditions. Once the eligibility check is completed, the system automatically sends email notifications to shortlisted students, ensuring timely communication. The application is developed using the Django web framework and follows a modular architecture that includes student management, job management, eligibility matching, notification services, and eligibility history tracking. The proposed system improves accuracy, reduces administrative workload, and enhances transparency in the recruitment process. By automating the shortlisting mechanism and maintaining centralized data records, the system provides a scalable and efficient platform for managing campus placements and can be extended in the future with advanced features such as resume parsing and intelligent recommendation systems.

Key Words: Campus Placement System, Eligibility Matching, Recruitment Automation, Student Information System, Django Web Application, Email Notification System, Skill-Based Matching, Placement Management System

1. INTRODUCTION

Campus placement is a critical process in educational institutions as it provides students with opportunities to transition from academic learning to professional careers. Training and Placement Officers (TPOs) are responsible for coordinating recruitment activities, managing student data, and ensuring that eligible candidates are shortlisted for various job opportunities. However, many institutions still rely on manual processes for verifying eligibility criteria, which often leads to inefficiencies, delays, and

inconsistencies in the recruitment process. With the increasing number of students and recruitment drives, it has become essential to develop automated systems that can efficiently manage placement-related activities.

1.1 Background of Campus Recruitment Systems

Traditional campus recruitment systems involve collecting student data and manually comparing it with company-specific eligibility criteria such as minimum academic performance, technical skills, and departmental requirements. According to Sharma and Gupta [2], web-based placement management systems have significantly improved data accessibility and communication between students and placement officers. Similarly, Patel et al. [3] highlighted the importance of automated job recommendation mechanisms that can match candidate profiles with employer requirements. These systems aim to simplify the process of candidate screening and improve efficiency in recruitment management.

1.2 Challenges in Traditional Placement Management

Despite the availability of digital tools, many placement cells still face challenges related to data handling and eligibility verification. Manual filtering of student records based on multiple criteria such as CGPA, backlog status, branch eligibility, and skill sets can be time-consuming and prone to human errors. Verma and Jain [6] emphasized that automated resume and profile screening techniques are necessary to handle large volumes of candidate data efficiently. Furthermore, Gupta and Arora [9] discussed that traditional recruitment methods often lack scalability and transparency, especially when dealing with a large number of applicants.

Another major challenge is the delay in communicating eligibility results to students. In many institutions, eligible candidates are informed through notice boards or manual emails, which may result in delayed notifications. Singh and Sharma [10] suggested that automated notification systems integrated with recruitment platforms can significantly enhance communication efficiency.

1.3 Need for an Automated Placement Eligibility System

The increasing complexity of recruitment criteria requires intelligent systems capable of automatically evaluating candidate profiles against job requirements. Research by Joshi and Kulkarni [11] indicates that data-driven approaches can significantly improve the accuracy of candidate selection processes. Automated eligibility systems help reduce administrative workload while ensuring consistent and unbiased evaluation of student profiles.

An automated placement eligibility system integrates student information management, job management, eligibility verification, and notification services within a unified platform. Such systems enable real-time processing of recruitment data and improve transparency in candidate shortlisting.

1.4 Overview of the Proposed System

To address the limitations of traditional placement management processes, this research proposes a Smart Placement Eligibility and Notification System. The system automates the process of verifying student eligibility based on parameters such as branch eligibility, academic performance, backlog constraints, and skill matching. Once the eligibility criteria are satisfied, the system automatically notifies eligible students through email notifications.

The proposed system is developed using the Django web framework and follows a modular architecture consisting of student management, job management, eligibility matching, and notification modules. The system also maintains an eligibility history database to prevent duplicate notifications and provide transparent tracking of candidate shortlisting.

2. PROPOSED SYSTEM

The proposed Smart Placement Eligibility and Notification System is designed to automate and streamline the campus recruitment process within educational institutions. The system integrates student information management, job posting management, automated eligibility verification, and real-time communication through email notifications. It eliminates the need for manual screening by allowing the system to dynamically evaluate student profiles against job eligibility criteria specified by companies. The system operates on a web-based architecture built using the Django framework. Students register and provide their academic details such as branch, CGPA, backlog status, and technical skills. These records are stored in a centralized database and remain inactive until verified by the Training and Placement Officer (TPO). The TPO reviews and approves student profiles to ensure data authenticity before they are considered for recruitment processes.

Similarly, job postings are entered by the TPO along with eligibility conditions including eligible branches, minimum CGPA, allowed backlog count, and required technical skills. Once a job posting is approved, the system automatically triggers the eligibility matching engine. The engine compares job criteria with student records and identifies candidates who meet the required conditions. The eligibility process is designed to be flexible and dynamic. A student becomes eligible if their academic and skill attributes satisfy the job requirements. The system also maintains an eligibility history database to ensure that each student receives only one notification per job. This prevents duplicate notifications and provides transparency in candidate selection.

After the eligibility verification process is completed, the system automatically sends email notifications to all eligible students, informing them about the job opportunity. By automating candidate screening and communication, the proposed system significantly reduces administrative workload, improves accuracy, and enhances the overall efficiency of placement management.

2.1 Student Management

The student management component allows students to register and maintain their academic profiles within the system. Students provide information such as branch, CGPA, backlog count, and technical skills. These records are stored in a centralized database for further processing. The system ensures that student data remains secure and consistent by allowing the TPO to verify and approve student records before they participate in the eligibility evaluation process.

2.2 Job Management

The job management component allows the TPO to add and manage recruitment opportunities provided by companies. Each job posting contains important details such as company name, job role, eligible branches, minimum academic requirements, and required technical skills. The system supports multiple branch selection and flexible skill requirements to accommodate real-world recruitment criteria. Once verified, job postings are activated and used for eligibility verification.

2.3 Eligibility Matching Engine

The eligibility matching engine is the core component responsible for automatically evaluating student records against job requirements. The engine compares student profiles with job eligibility criteria based on multiple parameters including branch eligibility, academic performance, backlog limits, and skill compatibility. Only those students who satisfy all required conditions are shortlisted. This automated evaluation process eliminates manual screening errors and ensures consistent candidate selection.

2.4 Notification System

The notification system is responsible for informing eligible students about recruitment opportunities. Once the eligibility engine identifies suitable candidates, automated email notifications are sent through an integrated email service. This ensures that students receive timely updates about job opportunities without requiring manual communication from the placement office.

2.5 Eligibility History Management

The system also maintains a record of eligibility results for each job posting. This eligibility history module prevents duplicate notifications and allows the TPO to track which students were shortlisted for specific jobs. Maintaining this historical data improves transparency and enables better monitoring of recruitment activities.

2.6 System Architecture

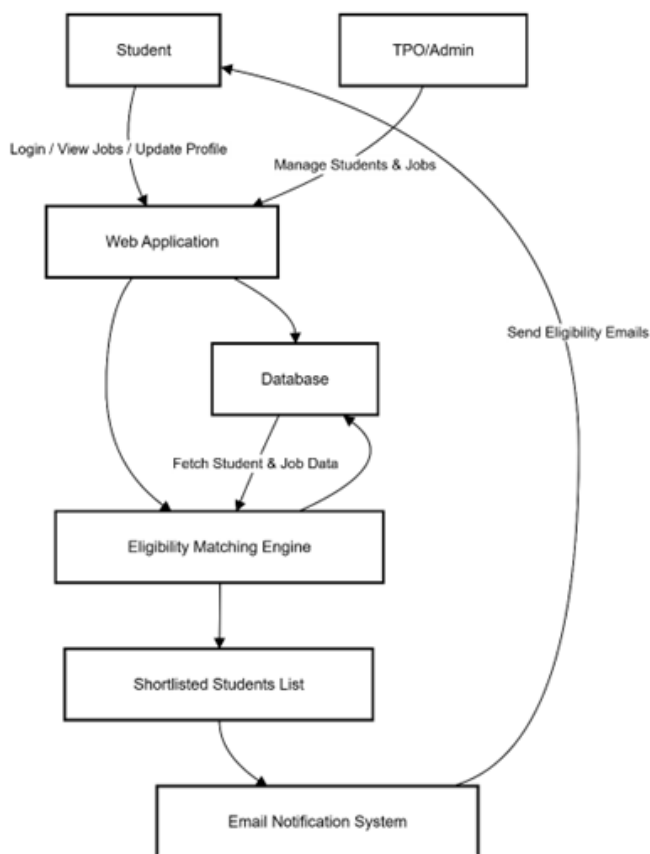


Fig - 1: System Architecture of Smart Placement Eligibility and Notification System

The system architecture consists of four main layers: the client layer, application layer, data layer, and service layer. The client layer includes the Student and TPO interfaces that interact with the system through a web browser. The application layer contains the core logic of the system,

including modules for student management, job management, eligibility matching, and notification services. The data layer manages the centralized database that stores student profiles, job information, and eligibility history records. Finally, the service layer handles external communication through email services that notify eligible students about recruitment opportunities.

3. IMPLEMENTATION DETAILS

The implementation of the Smart Placement Eligibility and Notification System focuses on developing a web-based platform that automates the process of managing student information, job postings, eligibility verification, and notification services. The system is implemented using the Django web framework, which follows the Model-View-Template (MVT) architectural pattern. This architecture helps in separating the application logic, user interface, and database operations, ensuring better maintainability and scalability. The system is divided into several functional modules that work together to automate the placement eligibility verification process. The implementation includes backend logic for eligibility matching, database management for storing student and job records, and an automated email notification system to inform eligible candidates.

3.1 Development Environment

The development of the proposed system is carried out using Python and the Django web framework. Django provides a robust environment for developing secure and scalable web applications. The backend of the system is implemented in Python, while the frontend interface is developed using HTML and CSS for user interaction. The system uses SQLite as the primary database for storing application data during development, although it can be easily migrated to other database systems such as MySQL or PostgreSQL for larger deployments.

The application is executed on a web server environment that processes user requests, retrieves relevant information from the database, and returns appropriate responses to the user interface. The integrated email service uses SMTP protocol to send automated notifications to students.

3.2 Database Design and Data Management

The database plays an essential role in storing and managing student records, job details, and eligibility information. The system maintains structured tables that store information such as student profiles, job postings, and eligibility history. The student table stores academic details including branch, CGPA, backlog count, and technical skills. The job table stores information about recruitment opportunities including company name, job role, required skills, eligible branches, and minimum academic requirements.

The eligibility history table records which students are eligible for specific job postings. This database structure ensures efficient retrieval and prevents duplication of notifications. The use of Django's Object Relational Mapping (ORM) simplifies database operations and enables seamless communication between the application and the database.

3.3 Eligibility Matching Algorithm

The eligibility matching process is the core functionality of the system. Once a job posting is approved by the TPO, the system automatically retrieves all approved student records from the database. The eligibility engine then compares the student profiles with the job requirements using predefined conditions.

The matching algorithm checks whether the student's branch is included in the list of eligible branches specified in the job posting. It then verifies that the student's CGPA satisfies the minimum academic requirement and that the number of backlogs does not exceed the allowed limit. The algorithm also performs skill matching by comparing the student's listed skills with the required job skills. If at least one skill matches and all academic conditions are satisfied, the student is considered eligible for that job. This automated evaluation process ensures accurate candidate shortlisting and eliminates the need for manual verification by the placement officer.

3.4 User Interface Implementation

The user interface of the system is designed to provide a simple and intuitive interaction experience for both students and the TPO. Students can register and update their profiles through the student interface, while the TPO can manage job postings, approve student records, and view eligibility results through the administrative dashboard.

The interface allows users to navigate easily between different modules of the system. Students can submit their academic details and view notifications about job opportunities, while the TPO can monitor recruitment activities and manage placement records efficiently.

3.5 Email Notification Integration

The system integrates an automated email notification service to inform eligible students about recruitment opportunities. Once the eligibility engine identifies suitable candidates, the notification module generates email messages containing job details and sends them to the corresponding students using an SMTP-based email service.

The system also maintains a notification status within the eligibility history table to ensure that duplicate emails are not sent for the same job posting. This automated communication mechanism significantly improves the efficiency of the placement process and ensures that eligible

students receive timely updates about available opportunities.

3.6 System Integration and Workflow

All modules of the system work together to provide a complete automated placement management solution. The workflow begins when students submit their profiles and the TPO approves them. The TPO then adds job postings with specific eligibility criteria. Once a job is approved, the eligibility engine processes student records and identifies eligible candidates. Finally, the system sends automated email notifications and stores the eligibility results for future reference. Through this integrated workflow, the system ensures efficient coordination between students and the placement office while minimizing manual effort and improving the accuracy of the recruitment process.

4. RESULTS AND PERFORMANCE ANALYSIS

This section presents the results obtained after implementing the Smart Placement Eligibility and Notification System. The system was tested to evaluate its functionality, efficiency, and reliability in automating the campus recruitment eligibility process. The evaluation focuses on key functionalities such as student profile registration, job posting management, eligibility verification, and automated email notification. The system demonstrates improved efficiency in handling recruitment data and reduces the manual effort required for candidate shortlisting.

4.1 Student Profile Registration Interface

The student registration module allows students to enter their academic and technical details into the system. The interface collects essential information such as student name, email address, branch, CGPA, backlog count, and skill set. These details are stored in the database and later used for eligibility verification during recruitment drives.

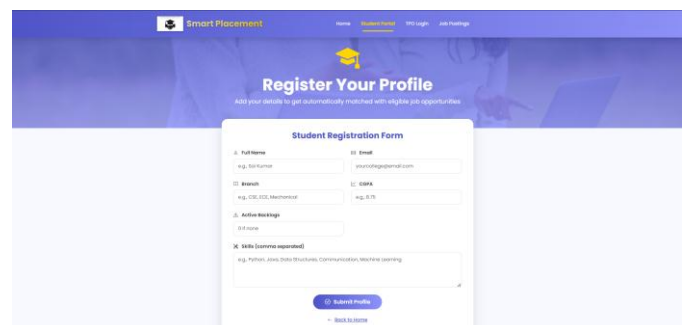


Fig - 2. Student Registration Interface

As shown in Fig. 2, the interface provides a structured form for entering student information. The design ensures ease of use and allows students to input their data accurately. Once the form is submitted, the information is stored in the

database and awaits approval from the Training and Placement Officer (TPO). This approval mechanism ensures that only verified student profiles are used in the eligibility evaluation process.

4.2 Job Posting and Eligibility Overview

The job management module allows the TPO to add and manage job postings provided by various companies. Each job record includes information such as company name, job role, minimum CGPA requirement, allowed backlog limit, required technical skills, and eligible branches. These parameters are used by the eligibility engine to determine suitable candidates.

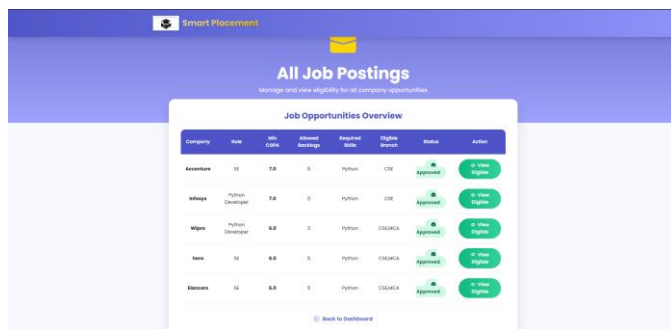


Fig - 3. Job Posting and Eligibility Overview

Figure 3 illustrates the job opportunities dashboard where multiple job postings are displayed in a tabular format. The interface provides a clear overview of company requirements and approval status. Once a job is approved by the TPO, the eligibility engine automatically processes student records to identify suitable candidates.

4.3 Administrative Dashboard for Placement Management

The administrative dashboard provides the TPO with centralized control over the placement management process. Through this interface, the TPO can view student records, approve student registrations, approve job postings, and monitor recruitment activities.

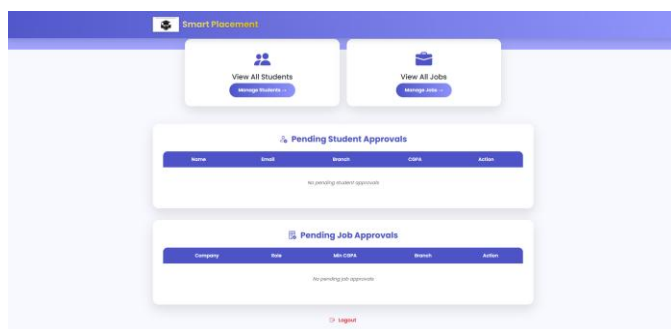


Fig - 4. TPO Administrative Dashboard

As illustrated in Fig. 4, the dashboard displays pending student approvals and job approvals. This allows the TPO to verify and approve data before it becomes active in the system. The interface also provides quick navigation options to view all students and job postings, enabling efficient monitoring of placement activities.

4.4 Automated Eligibility Verification

One of the key features of the system is the automated eligibility matching process. After a job posting is approved, the eligibility engine compares job requirements with student records stored in the database. The system evaluates multiple parameters including branch eligibility, academic performance, backlog limits, and technical skill matching.

The automated verification process ensures that eligible candidates are identified quickly and accurately. This eliminates manual filtering of student records and significantly reduces administrative workload.

4.5 Email Notification Performance

Once eligible students are identified, the system automatically sends email notifications through an integrated SMTP-based email service. Each eligible student receives a notification containing details of the job opportunity. The eligibility history module ensures that duplicate notifications are not sent for the same job posting.

The automated notification process improves communication efficiency and ensures that students receive timely information about recruitment opportunities.

4.6 System Performance Evaluation

The system demonstrates strong performance in managing placement-related activities. By automating the eligibility verification process, the system reduces the time required for candidate shortlisting. The modular architecture allows the system to handle multiple student records and job postings efficiently.

The results indicate that the proposed system provides a reliable and scalable solution for managing campus placements. It improves accuracy in eligibility verification, enhances transparency in the recruitment process, and significantly reduces manual effort for placement officers.

5. CONCLUSIONS

The Smart Placement Eligibility and Notification System provides an effective and automated solution for managing campus recruitment activities in educational institutions. The system addresses the limitations of traditional placement management processes by introducing an automated platform that integrates student profile management, job posting management, eligibility verification, and notification services. By eliminating manual

screening procedures, the system significantly reduces the workload of Training and Placement Officers while ensuring accurate and consistent candidate shortlisting.

The proposed system utilizes a centralized database to store student information and job details, allowing the eligibility engine to automatically evaluate candidate profiles against job requirements. The matching process considers multiple parameters such as academic performance, branch eligibility, backlog constraints, and technical skills, ensuring that only qualified students are identified for recruitment opportunities. This automated evaluation mechanism improves transparency and minimizes human errors during the shortlisting process. Another significant advantage of the system is its automated notification feature, which ensures that eligible students receive timely updates about job opportunities. By integrating email services into the platform, the system enhances communication efficiency and allows students to stay informed about recruitment drives without delays. Additionally, the eligibility history module helps maintain records of shortlisted candidates, preventing duplicate notifications and providing better traceability.

Overall, the developed system demonstrates a scalable and reliable framework for managing campus placement processes. The modular architecture implemented using the Django framework ensures flexibility for future improvements and integration with advanced technologies. The system contributes to improving the efficiency, accuracy, and transparency of recruitment management and provides a strong foundation for developing intelligent placement management platforms in educational institutions.

6. FUTURE WORK

Although the proposed Smart Placement Eligibility and Notification System effectively automates the process of managing campus recruitment activities, several enhancements can be incorporated in future versions to further improve the system's functionality, scalability, and intelligence. These improvements will allow the system to support more advanced recruitment processes and provide better user experience for both students and placement administrators. One possible enhancement is the integration of a resume upload and automated skill extraction feature. By incorporating Natural Language Processing (NLP) techniques, the system can automatically analyze resumes and extract relevant skills, educational details, and technical experience. This would reduce the need for students to manually enter their skills and ensure more accurate profile information.

Another important improvement involves implementing machine learning-based recommendation systems. Such systems can analyze historical placement data and suggest suitable job opportunities to students based on their academic background, skill sets, and career interests. This feature would make the placement system more intelligent

and personalized. The system can also be enhanced by adding a student dashboard where students can track their eligibility status, view applied jobs, and receive notifications regarding recruitment events. Similarly, the TPO dashboard can be extended to include analytical reports such as placement statistics, student skill distribution, and recruitment trends.

Additionally, future versions of the system can integrate multiple communication channels, including SMS notifications and mobile application support, to improve accessibility and ensure that students receive timely updates. Security enhancements such as role-based authentication and secure login mechanisms can also be implemented to protect sensitive student data. Finally, deploying the system on cloud-based platforms would enable better scalability and allow institutions to manage large volumes of student data and recruitment activities efficiently. These enhancements would transform the proposed system into a comprehensive intelligent placement management platform capable of supporting modern recruitment processes.

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