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College Placement Management System

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Abstract: ***The College Placement Management System is a web-based application designed to simplify and automate the campus placement process by providing a centralized platform for students, placement officers, and recruiting companies. In traditional placement management, maintaining student records, verifying eligibility, coordinating recruitment drives, and generating placement reports can be time consuming and prone to errors. To address these challenges, the proposed system streamlines the entire placement workflow by managing student profiles, company registrations, eligibility verification, job applications, and placement statistics through a secure and efficient platform. The application incorporates secure user authentication, role-based access control, student and company portals, automated eligibility checking, company-student mapping, and placement report generation to ensure a smooth recruitment process. Students can create and update their academic profiles, apply for eligible job opportunities, and track their application status, while companies can register, post job openings, and shortlist eligible candidates. Placement officers can manage recruitment drives, monitor placement activities, and generate detailed reports through an interactive dashboard. Developed using React, Express.js, Node.js and MongoDB, the system utilizes Searching Algorithms, Sorting Algorithms, Breadth-First Search (BFS) for company student mapping, and Hashing for efficient data retrieval and management. By integrating automated placement management with efficient data processing techniques, the College Placement Management System reduces manual effort, improves transparency, enhances placement coordination, and increases the overall efficiency of campus recruitment activities.***

Keywords: React.js, JavaScript, Node.js, Express.js, MongoDB, REST API, JSON, Authentication, Authorization, Responsive Web Design, Database Management, Search and Filtering Algorithms, Sorting Algorithms, Breadth-First Search (BFS), Recommendation System, College Placement, Campus Recruitment, Form Validation, Eligibility Checker, Company Portal, Student Portal, Hashing, Role-Based Access Control (RBAC).

I. INTRODUCTION

Campus placements play an important role in helping college students transition from academic education to professional careers. However, students often face difficulties in obtaining accurate and timely information about the placement activities conducted within their college. Information regarding upcoming companies, placement drives, eligibility criteria, job roles, recruitment processes, test and interview schedules, and preparation requirements may be distributed across different communication channels or shared informally. As a result, students may depend on assumptions, peer information, or external platforms and spend considerable time searching for relevant preparation resources. This creates a gap between the placement opportunities available in the college and the information required by students to prepare effectively.

The College Placement Management System (CPMS) is proposed as a college-specific web-based platform to address these challenges by bringing essential placement information into a centralized system. The platform is designed specifically for students of a particular college and provides information about companies participating in campus recruitment, upcoming placement drives, exact schedules, eligibility criteria, job roles, and recruitment-related activities. Students can check whether they are eligible for a particular company and understand the requirements before applying. This enables them to plan their preparation according to the actual opportunities available in their college rather than relying on generalized information from external sources.

Another important aspect of the proposed system is company-specific preparation. Instead of searching across multiple platforms for suitable learning resources, students can access relevant study materials and preparation resources associated with a particular company or recruitment process through the system. The platform also maintains information about previously placed students, including placement records and relevant experiences, which can provide students with practical insights into the recruitment process and preparation strategies. In addition, a student profile section allows users to maintain their basic information and upload required documents, making important placement-related information accessible from a single platform. The proposed system therefore aims to improve transparency, accessibility, and preparedness in the college placement process. By providing centralized and college-specific information, CPMS reduces uncertainty among students and helps them identify suitable opportunities, verify

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their eligibility, understand recruitment schedules, and prepare systematically for specific companies. The system uses a modern web-based architecture with React.js for developing an interactive and component-based user interface, while database and backend technologies can be integrated to manage dynamic placement and student information. Overall, CPMS provides a structured digital environment that connects placement information, student preparation, and previous placement experiences within a single college-oriented platform.

II. LITERATURE REVIEW

Several studies have been conducted to digitize and improve traditional campus placement and recruitment processes. These studies mainly focus on automating placement activities, managing student and company information, eligibility filtering, notifications, recommendations, and student preparation resources.

Sheetal S. Patil, Rahul Kothari, Rishabh Goel and Prakhar Singh Chauhan (2021) worked on Automation of Conventional Training & Placement Management System. Their system replaced manual placement activities with a web-based platform having modules for the Training and Placement Department, students, and companies. It provided preparation materials, previous-year interview questions, YouTube videos, company information, placed-student testimonials, upcoming-company notifications, and document uploading. The study showed that centralizing placement information and preparation resources can reduce manual work and improve communication [1].

Madhu Kumari and Seema Kuhikar (2019) developed Campus Recruitment Management System Software to improve communication of placement drives. Administrators and coordinators could add drive details, departments, videos, and images, while students could access placement materials and information. The system also maintained student profiles, company details, vacancies, and placement information. However, it used C# and MS Access and was not primarily focused on a student-centric preparation platform [2].

Deepali V. Musale, Mamta K. Nagpure, Kaumudini K. Patil and Rukhsar F. Sayyed (2016) proposed Job Recommendation System Using Profile Matching and Web-Crawling. The system matched student and company profiles using semantic and tree-based knowledge matching, generated preference lists, and supported keyword-based job searching through web crawling. It addressed information overload and unsuitable job applications through personalized recommendations. However, its main focus was job recommendation and external job searching rather than a college-specific repository of placement schedules, preparation resources, and previous experiences [3].

Gowthaman J. and Dr. R. Priya Anand (2025) presented a Campus Recruitment Management System using machine learning for placement prediction. The system used a Random Forest Regressor to estimate placement probability based on academic and candidate information and supported candidate recommendation and sorting. Although it introduced predictive analytics into placement management, its main focus was placement prediction and candidate recommendation rather than company-specific preparation and detailed college placement information [4].

Dr. Anitha R, Ajayraj L. D, Akshay Anil Naik, Arunkumar and Bhuvan H. (2026) developed College Placement Management System (CPMS): A Secure and Scalable Web-Based Platform for Campus Recruitment. The system addressed manual coordination, spreadsheets, emails, and physical documentation through centralized data management, job posting, eligibility verification, candidate shortlisting, and workflow automation. It also included role-based access and an eligibility verification algorithm. However, its functionality primarily focused on the complete recruitment lifecycle involving students, recruiters, and administrators [5].

Harish Bhaskaran, Raghavendra Rakesh, Ruthwick S. S., Kavana S. K., Hemalatha G. and Rajan Thangamani (2025) proposed a Student Placement Management System (SPMS) focusing on secure and centralized placement management. It provided student profiles, company registration, eligibility verification, placement tracking, reporting, and role-based access, along with multi-factor authentication and a Decision Support System for forecasting. However, the proposed CPMS focuses more specifically on upcoming college drives, company-wise preparation resources, and previous placement information for students [6].

Ms. N. G. Dharaniya, Sanjay Nivas G., Yogeshkar P., Sunil Kumar R. and Yuva Mugesh M. (2025) proposed the SIET Placement Portal, consisting of a Student Portal and Admin Dashboard. It provides upcoming drive details, eligibility criteria, and past interview questions, while administrators manage companies, drives, and student information. The study highlights past interview questions as an important preparation resource. The proposed CPMS extends this idea by integrating college-specific schedules, company information, preparation resources, and previous placed-student records and experiences [7].

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Dr. Reema Ajmera, Amit Bohra, Manish Kumar Jha, Dr. Sangeeta Soni and Deepti Arora (2025) worked on Design and Implementation of College Placement Management System. Their web-based system addresses paperwork, data redundancy, delays, and limited transparency through Student, Faculty, and Recruiter modules. Students can create profiles, build resumes, apply for jobs, and access interview preparation resources, while faculty and recruiters manage placement activities and candidates. The system uses cloud-based technologies to improve scalability and accessibility, demonstrating how an integrated platform can improve communication, collaboration, and placement efficiency [8].

Rumana Hasinullah Shaikh and Subhalaxmi Nayak (2026) worked on a machine learning-based personalized job recommendation system that recommends suitable companies to students based on their resumes. The system uses TF-IDF for resume processing and compares KNN, SVM, and Random Forest algorithms for company recommendation[9].

Padole, Yeole and Bhandarkar (2026) worked on AI-Driven Predictive Analysis of Student Placement Success: Identifying Skill Gaps, Psychological Factors, Trainer Effectiveness, and Industry Readiness Using Machine Learning and Deep Learning, which analyzes academic, technical, communication, psychological, and industry-readiness factors to predict student placement success using machine learning and deep learning models[10].

III. PROBLEM STATEMENT

Traditional placement processes involve manual work and scattered information, making it difficult to manage student details, company information, and placement activities. Students also lack easy access to preparation materials and placement updates. Hence, a centralized system is needed to reduce manual effort and organize placement information.

Campus recruitment requires effective management of student, company, vacancy, and drive information. Students may also have difficulty accessing complete placement details and applying to suitable drives. Therefore, a system is needed to manage recruitment information and communication effectively.

Students face difficulty finding suitable job opportunities due to large amounts of recruitment information and unclear job requirements. This may result in unsuitable applications. Therefore, a system is needed to match student profiles with company requirements and provide relevant job recommendations.

Eligibility verification and application management can require considerable manual effort. Therefore, an automated system is needed to verify student eligibility and manage applications efficiently and securely.

There is a need for better placement tracking, reporting, and analytical support to help administrators monitor placement activities and make informed decisions. Therefore, a system is needed to improve placement monitoring and decision-making.

Students may struggle to find accurate information about upcoming drives, eligibility criteria, and past interview questions. Therefore, a portal is needed to provide these placement details and preparation resources in an organized manner.

Placement activities involve different stakeholders such as students, faculty, and recruiters, making coordination and information sharing difficult. Therefore, an integrated system is needed to support interaction and coordination among these stakeholders.

Manual resume screening is time-consuming and may be inconsistent. A system is needed to recommend suitable companies based on students' resumes.

IV. METHODOLOGY

A. System Data Flow

The system follows a structured data flow to provide placement-related information to students of a particular college. The student first logs into the system and is authenticated before accessing the platform. After successful login, the student is directed to the dashboard, where company information, placement drives, eligibility criteria, job roles, schedules, and preparation resources can be accessed. The system retrieves the required information from the backend and database and displays it through the React.js interface. Students can also manage their profile information and upload required documents.

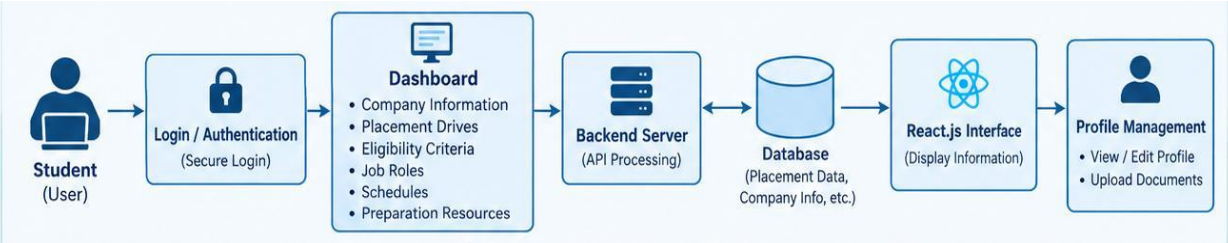


Fig 4. 1. System Data Flow

B. Company Information and Preparation Module

The system organizes placement information on a company-wise basis so that students can understand the requirements and preparation process for a specific company.

Step 1 – Company Information: The system provides details such as company name, job role, eligibility criteria, placement drive information, and recruitment process.

Step 2 – Placement Schedule: Upcoming company drives, test dates, interview schedules, and other important placement activities are displayed to students.

Step 3 – Preparation Resources: Company-specific study materials, interview questions, quizzes, previous-year questions, and other useful preparation resources are provided to help students prepare according to the selected company.

Step 4 – Direct Application: Students can directly apply for a company placement drive if they meet the required eligibility criteria. Using the preparation resources provided by the system is optional; students are not required to study through the system before applying. Students can choose to prepare using these resources or apply directly according to their preference.

Step 5 – Previous Placement Experiences: Records and experiences of previously placed students are provided to give students practical information about the recruitment process and preparation followed by earlier students.

C. Student Profile and Placement Drive Workflow

A student creates and maintains a personal profile containing basic academic and personal information required for placement activities. Required documents can also be uploaded through the system. When a company placement drive is available, the system displays its eligibility criteria and relevant information to students. Students can check whether they meet the required criteria and access the corresponding preparation resources. Placement-related information and records are maintained in the system so that students can follow upcoming opportunities and prepare systematically. The collected placement information is managed through the backend and database and presented through the React.js interface for easy access.

The workflow allows students to update their profile whenever there are changes in their academic or personal information. Based on the eligibility status, students can either access the available preparation resources and apply for the drive or explore other suitable placement opportunities. After applying, students can track application status, upcoming recruitment activities, notifications, and placement records through the system. This provides a continuous workflow from profile creation and eligibility checking to application and follow-up.

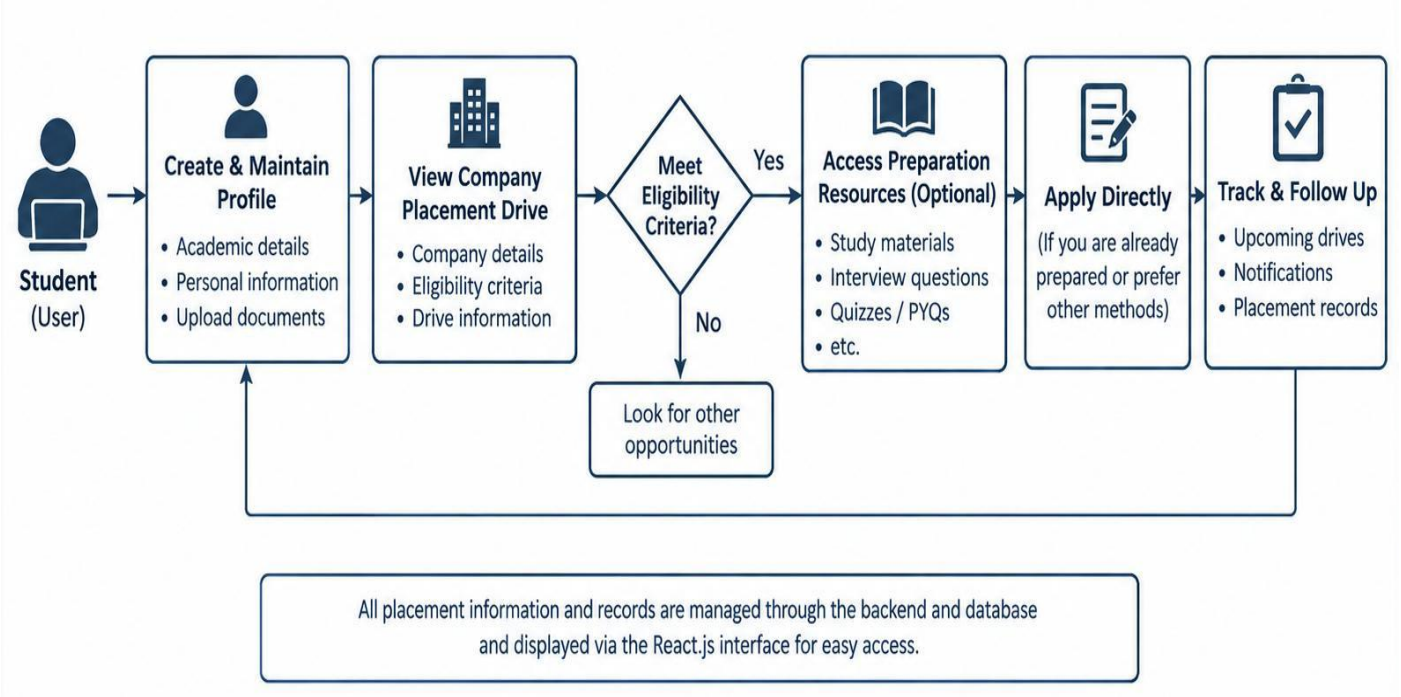


Fig 4. 2. Student Profile and Placement Drive Workflow

V. IMPLEMENTATION

A. Core Modules

Table 5. 1. System Modules and Descriptions

Module	Description
User Authentication	Secure role-based sign-up/login for students, companies, and placement officers
Student Profile Management	Academic record creation, resume upload, and profile updates
Company Registration & Job Posting	Company onboarding, job posting, and eligibility-criteria definition
Preparation Resources Modules	Company specific study materials, interview questions, quizzes, and previous-year questions for placement preparation.
Eligibility Checker	Automated matching of student records against job eligibility criteria
Placement Drive Management	Scheduling, tracking, and status management of recruitment drives
Report & Analytics Dashboard	Placement statistics, application tracking, and drive-wise reporting

B. Technology Stack

Table 5. 2. Technology Stack

Layer	Technology	Purpose
Frontend	React.js	Builds the interactive user interface
Styling	HTML, CSS	Structures and styles the web pages
Client-side Logic	Javascript	Handles user interactions and validations
Backend	Node.js	Handles server-side logic and requests
API	REST API	Connects the frontend with the backend
Database	MongoDB	Stores and manages system data
Data Format	JSON	Transfers and exchanges data between the frontend and backend

C. Frontend Implementation

The frontend is implemented using React.js, HTML, CSS, and JavaScript to provide an interactive and user-friendly interface. The dashboard allows students to view company information, placement drives, eligibility criteria, and recruitment details. Students can manage their profile and upload required documents through dedicated forms. Company-specific preparation resources such as study materials, quizzes, and interview questions are displayed for optional use. An application option is provided so eligible students can directly apply without completing the preparation resources. The frontend communicates with the backend using REST APIs to retrieve and submit placement-related data.

D. Database Schema

The system uses MongoDB to store and manage placement-related information. Separate collections are maintained for students, companies, placement drives, resources, applications, and previous placement experiences. The Students collection stores profile, academic, and document details, while Companies stores company and eligibility information.

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The Placement Drives collection maintains drive dates, test dates, interview schedules, and status. Resources are linked with companies to provide relevant preparation content. Applications maintain student application details and status, while Experiences store previous students' placement experiences.

E. Eligibility Algorithm Implementation

The eligibility algorithm compares the student's academic and profile details with the eligibility criteria specified by the selected company. The system first retrieves the student's details and the corresponding company criteria from the database. It then checks conditions such as academic percentage, branch, qualification, and other required criteria. If all mandatory conditions are satisfied, the student is marked Eligible. If any required condition is not satisfied, the student is marked Not Eligible. For eligible students, the system displays the application option along with optional preparation resources. This allows students to either prepare using the provided resources or directly apply for the placement drive.

VI. RESULT

A. Results of the System

The system was developed and tested across all major functional areas, including authentication, profile management, eligibility checking, and report generation. The platform successfully demonstrated end-toend functionality for the complete placement workflow, from student registration through final placement recording.

B. Authentication Module Results

The authentication module was verified for both correct-path and error-path scenarios. The system correctly created role-specific accounts, granted access only to the dashboard corresponding to the authenticated role, and rejected access attempts to protected routes without a valid session.

C. Eligibility Checking and Mapping Results

The eligibility checker correctly filtered student records against CGPA, backlog, and branch criteria for each job posting, and the BFS-based mapping stage consistently produced complete, duplicate-free eligible student lists for every recruitment drive tested. Sorting and binary search reduced the time required to identify eligible candidates compared to a linear scan of the full student dataset, with the improvement becoming more pronounced as the number of student records increased.

D. Placement Drive and Report Generation Results

Placement drives were created, tracked through their status lifecycle, and closed correctly in all test scenarios. Hash-indexed aggregation allowed the reporting dashboard to compile application counts, shortlist sizes, and placement outcomes without noticeable delay, giving placement officers an up-to-date view of ongoing and completed drives.

VII. FUTURE SCOPE & CONCLUSION

A. Conclusion

The College Placement Management System (CPMS) provides a centralized, college-specific platform for managing and accessing placement-related information. The system helps students stay informed about companies, placement drives, schedules, eligibility criteria, job roles, and company-specific preparation resources. It also provides previous placement records and experiences, helping students understand recruitment processes and prepare more effectively. The student profile and document upload features further support placement activities. By bringing important placement information and preparation resources together in one platform, CPMS reduces dependency on scattered information sources and helps students make informed decisions and prepare systematically for campus placements.

B. Future Scope

1) Mobile Application: Develop Android/iOS applications for easier access to placement information.
2) Advanced Recommendations: Recommend companies and preparation resources based on student profiles, skills, and interests.
3) AI-Based Assistance: Introduce an AI chatbot to answer placement-related queries and guide students during preparation.
4) Blockchain-Based Certificate Verification**:** Blockchain can be integrated to securely store and verify student certificates, academic records, **resumes** and placement documents, reducing the possibility of document tampering.

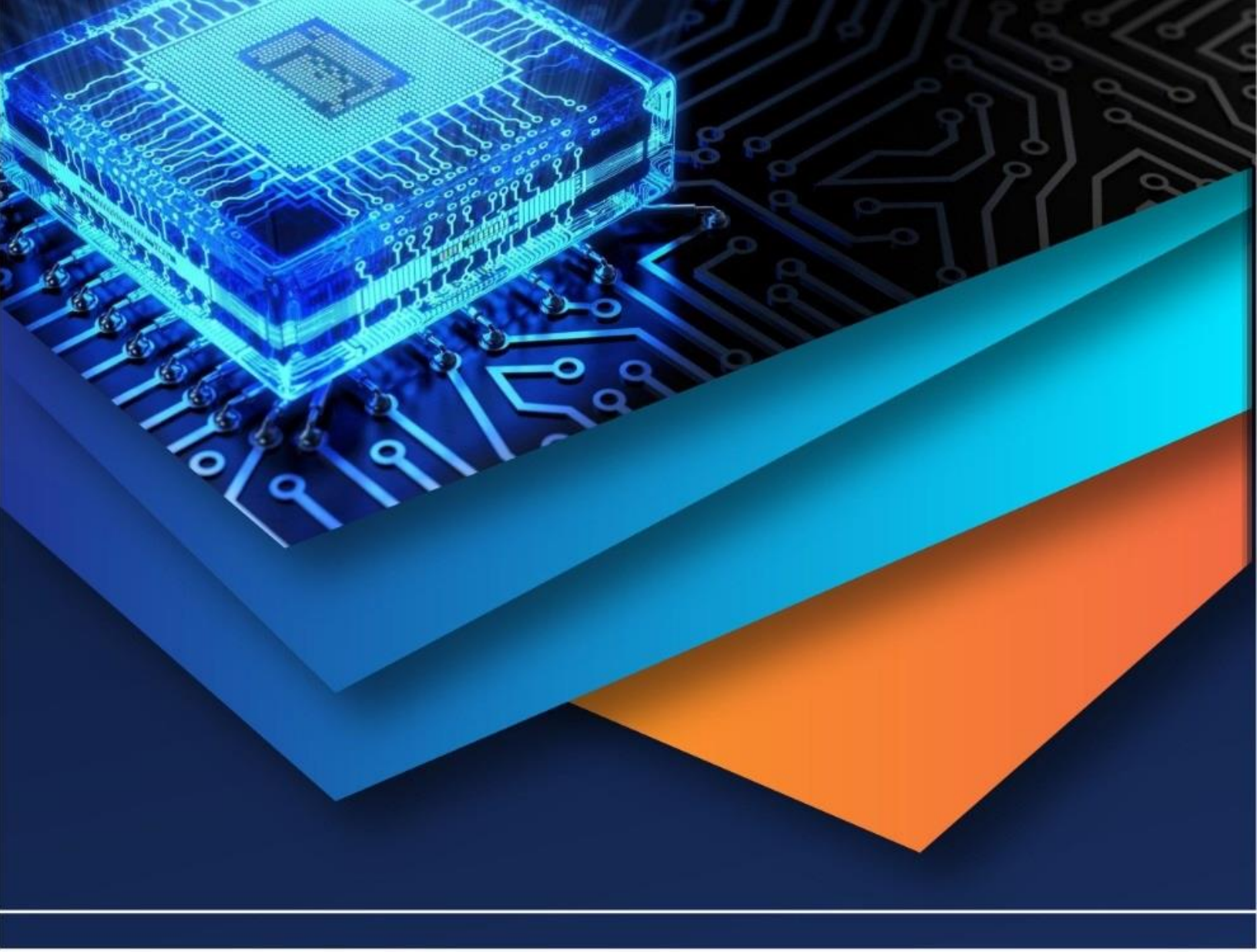
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5) Alumni Networking Module: A dedicated alumni network can connect current students with previously placed students for mentorship, guidance, referrals, and sharing real recruitment experiences.
6) Multi-College Placement Network: The system can be extended from a single-college platform to a network connecting multiple colleges, allowing recruiters to conduct centralized recruitment drives across institutions.
7) Recruiter Feedback System**:** Recruiters can provide structured feedback on candidates after interviews and recruitment drives. This feedback can help students and placement officers identify areas for improvement.

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