Placement Preparation Tool

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*Abstract*— For engineering students, the shift from school to the workplace is a crucial time that calls for efficient study resources to help them adjust. "Get Placed" is a cutting-edge online tool created to help engineering students make the most of their placement prospects. This tool offers a comprehensive approach to placement preparation by integrating multiple modules, including Study Material, Quiz Me, Track Progress, and Mock Interview.  
  
In accordance with the curriculum and possible interview questions, the "Study Material" module offers succinct and targeted content on important subjects and subtopics such data structures, arrays, and matrices. Through topic-based, verbal ability, and company-specific exams, "Quiz Me" gives students the opportunity to assess their knowledge. The more than 150 different questions on the site improve comprehension and response time.  
  
A dynamic tool called "Track Progress" records user performance information and offers tailored feedback to assist pupils in identifying their areas of strength and growth. In order to improve their readiness for genuine interviews, users can record, playback, and edit their responses in the "Mock Interview" module, which mimics real interview situations.  
  
A strong technology stack comprising Vue.js, HTML, CSS, Flask, SQL, PHP, and JavaScript was used in the platform's construction to guarantee a responsive and user-friendly experience. "Get Placed" offers a methodical, all-inclusive preparation approach with the goal of not only assisting students in passing interviews but also in thriving in them.

Keywords— Placement Preparation, Engineering Education, Mock Interviews, Performance Tracking , E-Learning Platform , Exam Simulation , Artificial Intelligence, real-time feedback , Technology-Enhanced Learning

# INTRODUCTION

The move from academics to industry in today's educational environment is characterised by demanding placement tests that assess students' practical application of information under time restrictions in addition to their academic aptitude. Because it frequently dictates the

course of students' professional lives, this transitional period is crucial. Given the difficulties students encounter

in sufficiently preparing for these tests, there is an increasing demand for study aids that not only support efficient study techniques but also replicate the forms and demands of actual testing situations. The creation of a comprehensive system designed to improve students' readiness for placement exams—the Placement Preparation Tool—is presented in this paper. This tool's main goal is to offer a customised, interactive practice environment that adjusts to each user's unique learning preferences and performance. The program aims to provide a realistic and demanding preparation environment by integrating a varied question library and mimicking real test settings.

Cutting-edge technology is essential to this tool's operation. To ensure that students encounter challenges that match their learning curves, the system provides customized practice sessions and learning paths tailored to each student's needs. Written responses are evaluated using advanced algorithms, delivering crucial real-time and actionable feedback.

Because of its user-centric design, the platform is accessible through both online and mobile interfaces, allowing students to utilize the tool whenever it is most convenient for them. The goal of this approach is to increase students' chances of landing desired jobs by equipping them with the knowledge and self-assurance they need to ace their placement exams.

In order to establish the tool's importance in the current educational toolset for job preparation, we provide an overview of its architecture, features, and effects on student outcomes. This system incorporates a range of technologies that enhance its functionality and user experience, making it an indispensable part of job preparation for engineering students.

# LITERATURE REVIEW

Present Difficulties with Placement Preparation Given the increasingly competitive job market, it is impossible to overestimate the significance of effective placement preparation in educational institutions. Because traditional placement preparation approaches are generic and non-interactive, they frequently fall short of meeting the dynamic demands of students, which results in less than ideal job placement outcomes. The limitations of manual training procedures and the need for technological integration through machine learning to improve the training process by offering real-time feedback and automated interview simulations are highlighted in studies like those by Aishwarya et al. (2019).

Innovations in Technology for Placement Training Developments in machine learning (ML) and artificial intelligence (AI) have completely changed how educational training systems are approached. Using AI to ensure accurate and timely information sharing, the AI-Based Placement Management System by Pandit et al. (2022) presents an automated system that addresses traditional system shortcomings like manual data entry errors, security concerns, and the inefficiency of update dissemination (D10012729). As an example of the critical role data-driven approaches play in improving placement preparation and predicting accuracy, the Smart Prep system created by Kandekar et al. (2024) uses machine learning techniques to forecast a candidate's appropriateness for work postings.

**"AI-enhanced Human Resource Management: A System for Predictive Candidate Assessment" by H. Nguyen and A. Sharma (2020) .** This study focuses on the use of machine learning algorithms to predict job candidate success based on historical employment data and psychometric tests. The system developed by Nguyen and Sharma integrates various machine learning techniques to analyze patterns from past hiring decisions and candidate performances, providing HR professionals with predictive insights that can inform future hiring choices. This approach allows for a more data-driven decision-making process in HR, optimizing the fit between job requirements and applicant capabilities without specifically analyzing verbal or non-verbal communication.

Evaluation of Machine Learning Methods in Comparison There is a lot of potential in the study of several machine learning methods for training and placement prediction. Among the most widely used algorithms are Random Forest, Naïve Bayes, and Decision Trees; Random Forest frequently outperforms the others in terms of accuracy and dependability when it comes to student placement prediction (IRJET-V11I303). By offering individualised learning experiences based on predictive analytics, these findings point to a significant potential for machine learning algorithms to improve the efficacy and efficiency of placement training programs.

In order to overcome the drawbacks of conventional techniques, the studied literature clearly shows a trend towards the integration of AI and ML in placement preparation tools. These technologies' proven ability to adjust to the demands of each individual student and offer focused instruction and feedback has opened the door for more individualised and effective preparation techniques that may greatly enhance placement results.

# METHODOLOGY

1. Overview of the System The Placement Preparation Tool seeks to give students a thorough environment in which to get ready for job placements. Study, Quiz Me, Track Progress, and Mock Interview are some of the modules that are integrated into this system. From learning and practice to performance evaluation and practice interviews, each module is made to help with a different facet of the placement preparation process.

2. The stack of technologies

Development Tools : IDE/Code Editors: VS Code

Backend Development : Database: MySQL Server for database management, PHPmyAdmin

API Development : Postman for testing APIs, Flask (Python), and RESTful API libraries

Frontend Development : VueJS: Node.js, NPM (Node Package Manager), Vue CLI for web development

Cloud Services (AWS) :

EC2: Virtual servers for hosting the backend

RDS: Managed MySQL database service

S3: Storage for static assets like images, documents, and backups

Route 53: Domain name management and routing

IAM: Identity and Access Management for secure access control

A diagram of a computer

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3. Design and Implementation of Modules  
  
**3.1 Study Module:**

* **Function:** Provides access to a wide range of subjects and subtopics, along with related resources and links.
* **Implementation:**
  + Content viewing interface for selecting topics.
  + Dynamic retrieval of data based on user choices.
  + Integrated with third-party resources through RESTful API calls developed with Flask to fetch relevant videos and articles.

**3.2 Quiz Me Module:**

* **Function:** Offers tests of knowledge on various topics to assess readiness.
* **Implementation:**
  + A quiz management system built with Flask, generating quizzes based on predefined topics.
  + Real-time scoring and feedback managed through backend logic.

**3.3 Track Progress Module:**

* **Function:** Tracks and visualizes user progress over time, assigning scores to activities.
* **Implementation:**
  + Dashboard created with Vue.js displaying analytics, progress graphs, and user scores.
  + Backend built with Flask to analyze performance data and generate insights and reports.

**3.4 Mock Interview Module:**

* **Function:** Simulates a real interview setting using questions, recorded answers, and feedback.
* **Implementation:**
  + Real-time video recording capabilities implemented using WebRTC.

**4. Testing and Integration:**

* **Implementation:**
  + Ensuring all modules integrate smoothly with data flowing correctly between the MySQL database, Vue.js frontend, and Flask backend.
  + Use Postman for API testing to ensure that the RESTful services function as intended.
  + Performance testing to ensure the application’s responsiveness and scalability.

**5. Deployment:**

* **Implementation:**
  + Deployment of the application on AWS cloud platform using EC2 for virtual servers, RDS for database management, and S3 for storage of static assets.
  + Route 53 for domain name management and routing, with IAM for secure access control.

**6. Iteration and User Feedback:**

* **Implementation:**
  + Inclusion of real-time user feedback collection features.
  + Iterative improvement of the system’s features and user experience based on user feedback.

# **Project Scope :**

● **AI-Powered Customized Learning:** Create a system that adjusts practice sessions according to each student's performance, changing the content and level of difficulty in real time to offer a customized learning environment.

● **Comprehensive Question Bank and Mock Exams:** Compile a sizable, varied question bank that covers a variety of topics, along with written and multiple-choice mock exams that mimic actual placement tests.

● **Performance Analytics and Feedback:** Use performance tracking to provide students with comprehensive information about their strengths and weaknesses as well as feedback to help them prepare for tests.

● **Evaluation of Written Responses:** Utilize advanced algorithms to automatically assess written responses and provide precise feedback to improve communication and writing abilities.

A diagram of a preparation tool

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# **Objectives:**

**Comprehensive Study Material**

* A structured repository of study materials covering essential topics (e.g., Data Structures, Algorithms) with subtopics and short notes to facilitate effective learning.

**Interactive Quiz Functionality**

* Developed a quiz feature that allows users to take various quizzes (topic-wise, verbal, aptitude, logical, and company-specific) that dynamically fetch questions from the database, ensuring a diverse question pool.

**Performance Tracking and Feedback**

* Integrating a performance tracking system that records user scores, provides feedback, and generates visual graphs to help users understand their strengths and weaknesses in different topics.

**Realistic Exam Simulations:**

* Give students practice tests that mimic the structure and timing of actual placement exams to boost their self-esteem and time management skills.

**User-Friendly Interface:**

* An accessible, user-friendly interface that is responsive on mobile and web platforms and allows for smooth navigation.

**Cloud-Based Infrastructure:**

* Leverage cloud technologies to ensure scalable, secure, and reliable platform performance, capable of handling large numbers of users.

VI . FUTURE SCOPE

● Video-Based Learning: To improve student engagement and clarify difficult subjects, provide webinars, live sessions with experts, and video tutorials.

● Live Video Interviews: Use the platform to enable direct interviews between recruiters and students, giving them a taste of what it's like to be interviewed in person.

● AI-Powered Feedback for Live Mock Interviews: Use AI to analyze video interviews in real-time and give students tailored feedback on their tone, nonverbal cues, and facial expressions to help them get better at interviews.

VII . CONCLUSION

By providing individualized instruction, an extensive question bank, performance monitoring, and realistic exam simulations, the Placement Preparation Tool seeks to transform students' preparedness for placement tests. The tool will offer a comprehensive platform to enhance academic and interview skills with future additions like real-time video interviews, AI-driven feedback, and live mock interviews, ultimately increasing students' chances of success in the cutthroat job market.

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