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Research Paper

AI Powered Placements Preparation Portal: A Unified Web Platform for Campus Recruitment Preparation

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***Abstract*—Preparing for campus recruitment usually requires students to move between separate resources for aptitude practice, technical revision, resume writing, interview rehearsal and progress tracking. This paper presents the AI Powered Placements Preparation Portal, a centralised web-based platform that brings these activities into one structured preparation journey. The portal combines student profiles, topic-wise learning material, aptitude and technical quizzes, resume guidance, interview-question practice and a progress dashboard. A transparent rule-based layer prioritises topics using quiz performance, recency of practice and the student's stated goals, while optional AI-assisted features support practice-question drafting and rubric-based feedback on written interview answers. The core portal remains usable when the AI service is unavailable, and all AI output is labelled as advisory. The paper describes the problem background, related approaches, architecture, functional requirements, methodology, modules, proposed test cases and an evaluation framework. No accuracy, placement-rate or satisfaction figures are reported, because such evidence can only come from testing the deployed system.**

***Index Terms*—placement preparation, campus recruitment, web portal, aptitude practice, interview preparation, recommendation, generative AI, learning analytics**

I. Introduction

Campus recruitment is the main route from academic study to professional employment for many engineering students. Selection typically combines several stages, namely aptitude tests, programming assessments, technical interviews, communication rounds and resume screening, and employers look for a broad set of career-readiness competencies rather than technical knowledge alone [1]. Students must therefore prepare across quite different skill areas within a limited time.

In practice, preparation material is scattered across websites, practice platforms, personal notes and informal advice from seniors. A student may solve aptitude questions on one service, practise coding on another and keep a resume in a separate file, with no single view of what has been covered and what remains weak. Two findings from learning research make a unified approach attractive. Retrieval practice through repeated testing improves long-term retention compared with passive re-reading [2], and timely, specific feedback is among the strongest influences on learning when it tells the learner how to improve [3].

Recommendation techniques and large language models make it feasible to add personalised guidance. Language models can generate fluent text for drafting practice questions and commenting on written answers [4], and their opportunities and risks in education have been widely discussed [5]. Individual attention has long been associated with better learning outcomes [6], but automated output can be incomplete, biased or incorrect, so AI features must be introduced with clear limits and human oversight.

This paper presents the AI Powered Placements Preparation Portal, a web-based platform that organises preparation into a single workflow of goal selection, topic suggestion, practice, feedback and progress review. The portal is a preparation aid; it does not predict or guarantee interviews, selection or placement. Its AI-assisted functions are optional and isolated behind a service interface.

A. Objectives

- Provide a centralised portal for aptitude, technical, resume and interview preparation.
- Organise practice material by topic, difficulty and placement stage.
- Offer quizzes with explanations so that students can identify topics for revision.
- Track completed activities and present progress in a student dashboard.
- Use AI-assisted recommendations and feedback where suitable, with clearly stated limitations.
- Support maintainable content administration and protect student information.

B. Organisation of the Paper

Section II reviews related work and identifies the gap. Section III presents the architecture and requirements. Section IV describes the methodology. Section V covers implementation and proposed testing. Section VI sets out the evaluation framework and discussion, followed by advantages and limitations, future scope and conclusion.

II. Related Work and Problem Identification

Learning management systems. These systems organise courses, lessons, assessments and learner records, and their structured content and progress tracking suit placement preparation. A general-purpose system, however, does not model the stages of a recruitment process, so aptitude rounds, coding practice, resumes and interviews would each need separate configuration.

Coding and aptitude platforms. These provide question banks, timed tests and automatic scoring, which support repetition and objective progress checks. Their scope is usually limited to technical or quantitative skills; resume improvement and communication practice are left to other tools.

Career services and interview resources. Career resources offer resume advice, interview tips, role descriptions and sample questions. Occupational databases such as O*NET describe the skills and tasks associated with roles [7], which helps organise content, but the quality of informal advice varies by source. A portal should therefore curate content and label topics clearly.

Recommendation and AI-assisted feedback. Recommender systems suggest items using user behaviour and item attributes [8]. In education, even simple rules based on assessment results and recency can direct attention to weak topics, and the reason for a suggestion can be explained to the learner. AI-assisted systems can additionally draft practice prompts and give structured feedback on written responses [4], [5]. Frameworks for trustworthy AI stress validity, transparency, privacy and human oversight [9], and guidance for education stresses that generative tools should support rather than replace learner agency and teacher judgement [10]. These principles shape the design: AI output is advisory, based on defined rubrics where possible, and distinguishable from verified content.

TABLE I
COMPARISON OF EXISTING APPROACHES AND THE PROPOSED PORTAL

Approach	Strength	Potential gap
Separate websites	Wide variety of resources	Progress is fragmented
General learning platform	Structured courses and assessments	May lack placement-specific workflow
Practice-only platform	Repeated tests and scoring	Limited resume and interview support
Proposed portal	Unified preparation workflow	Requires curated content and careful evaluation

A. Problem Statement

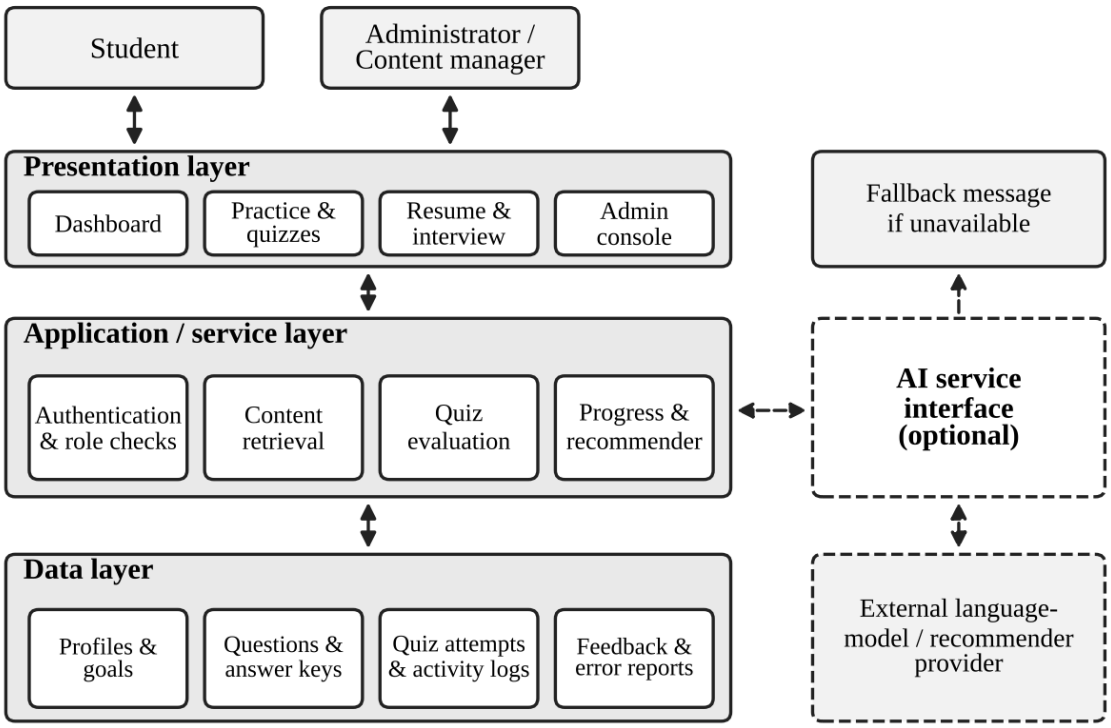
Students find it difficult to identify preparation priorities, locate reliable material and assess their readiness across the different placement rounds. Fragmented resources lead to inconsistent practice and limited visibility into strengths and weaknesses. The problem addressed here is the design of a unified portal that organises placement preparation, records learning activity and offers responsible AI-assisted guidance.

B. Gap Identification

- Preparation activities are distributed across multiple unrelated services.
- Students lack a single dashboard across aptitude, technical and interview preparation.
- Generic study plans may not reflect a learner's goals or quiz performance.
- Automated feedback is hard to trust when its criteria and limitations are not explained.
- Student data, resumes and written responses require careful access control and retention practices.

III. PROPOSED SYSTEM ARCHITECTURE

The portal follows a layered web-application architecture (Fig. 1) with a presentation layer, an application layer, a data layer and an optional AI service integration. The presentation layer provides responsive pages for students and authorised administrators. The application layer handles authentication, request validation, permission checks, content retrieval, quiz evaluation and progress calculation. The data layer stores account metadata, question content and answer keys, learning resources, quiz attempts, activity logs and feedback records.



Solid arrows: core portal flow. Dashed arrows: optional AI-assisted flow.

Fig. 1. Layered architecture of the AI Powered Placements Preparation Portal.

AI-dependent requests are isolated behind a service interface. This allows the application layer to monitor calls, apply privacy controls, show a fallback message when the service is unavailable and replace the provider in future. Sensitive items such as resumes are minimised, access-restricted and retained only as long as needed.

A. Functional Requirements

TABLE II
FUNCTIONAL REQUIREMENTS OF THE PORTAL

ID	Function
FR1	Account creation, sign-in and sign-out with role-based access for students and administrators
FR2	Student profile and selection of preparation goals
FR3	Browsing of content by category, topic and difficulty
FR4	Aptitude and technical quizzes with automatic scoring and explanations
FR5	Resume-preparation checklist and optional resume feedback
FR6	Interview-question practice with rubric-based feedback
FR7	Activity logging and a progress dashboard
FR8	Topic suggestions from quiz results, recency and goals
FR9	Optional AI-assisted question drafting and feedback, labelled as advisory
FR10	Administrator tools for question review, topic updates and publication
FR11	A way for users to report incorrect content
FR12	Fallback message and uninterrupted core features when the AI service is unavailable

IV. METHODOLOGY

The methodology covers requirements analysis, portal design, content organisation, module development, integration and evaluation. Core preparation functions are deliberately separated from optional AI-assisted features, so that the portal remains useful when an AI service is unavailable.

A. Proposed Workflow

The student creates or accesses an account, selects a goal, reviews suggested topics, completes practice activities and checks progress (Fig. 2). Quiz outcomes and selected goals inform the next suggestions. AI-generated feedback, if enabled, is presented as assistance rather than a final authority; updated results change the next suggestions.

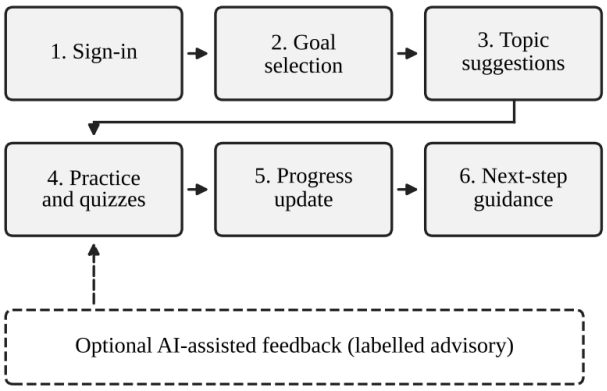


Fig. 2. Student preparation workflow with optional AI-assisted feedback.

B. Content Organisation

Content is grouped into placement stages and skill categories (Table III). Each item carries a title, topic, difficulty label, source or author and review status, and all answers are verified before release. Role descriptions from occupational databases [7] can guide which skills are emphasised for a goal.

TABLE III
PLACEMENT STAGES AND SKILL CATEGORIES

Stage	Skill categories	Typical activity
Aptitude	Quantitative aptitude, logical reasoning, verbal ability	Timed quizzes with explanations
Technical	Programming fundamentals, data structures, databases, operating systems	Concept questions; coding exercises where safely supported
Resume	Projects, education, skills, internships, achievements	Checklist and optional feedback
Interview	Interview communication, role- and subject-based questions	Answer practice with a rubric

C. Rule-Based Topic Recommendation

A basic, explainable rule prioritises topics with low quiz scores, topics not practised recently and topics selected by the student. For a topic t the priority score is:

$$P(t) = w_1(1 - s_t) + w_2\, r_t + w_3\, g_t \qquad (1)$$

where $s_t \in [0, 1]$ is the normalised recent quiz score on t, $r_t \in [0, 1]$ is a recency term that grows with days since last practice and is capped after a set period, $g_t \in \{0, 1\}$ marks a student-chosen goal, and w_1, w_2, w_3 are non-negative weights summing to one. Topics with no attempts receive the maximum recency term so unseen material is surfaced. Topics with the highest $P(t)$ are suggested first and the portal shows the reason. The weights are design parameters to be tuned with pilot data; no values are claimed.

D. AI-Assisted Features

If a generative AI service is used, prompts contain only the relevant topic and rubric and avoid unnecessary personal data. Each feature has a defined input, expected output and evaluation criterion (Table IV). Generated questions and feedback are checked for correctness and suitability, and the portal distinguishes generated content from verified resources, in line with [9], [10].

TABLE IV
AI-ASSISTED FEATURES, OUTPUTS AND EVALUATION CRITERIA

Feature	Input	Output	Criterion
Question drafting	Topic, difficulty, rubric	Draft questions for reviewer approval	Correctness, duplicates, difficulty, alignment
Interview feedback	Question, response, rubric	Structured comments and suggestions	Rubric adherence, relevance, fairness
Resume feedback	Minimised resume text	Suggestions on clarity and format	Accuracy of advice; privacy
Suggestion wording	Scores, recency, goals	Ranked topics with a reason	Consistent with (1)

For interview answers, a rubric assesses structure, relevance, clarity and completeness, and the student reviews the feedback critically.

E. Security and Privacy

- Authentication and role-based authorisation separate student and administrator functions.
- Inputs are validated and the application is protected against common web vulnerabilities such as those catalogued by OWASP [11].
- Secure transport is used and passwords are never stored in plain text.
- Access to resumes, responses and progress records is limited to authorised purposes.
- Users are told what is sent to any external AI service, and unnecessary personal details are withheld.
- Error handling, backups and a way to report incorrect content are provided.

F. Evaluation Plan

Evaluation includes functional tests for sign-in, browsing, quiz scoring, progress updates and content management; usability testing, for which an instrument such as the System Usability Scale [12] may be used; and human review of AI-assisted feedback against a rubric. Only measured outcomes are reported, with the sample, environment and limitations stated.

V. Implementation

The portal is implemented as independent modules that can be developed and tested separately before integration. Table V describes the environment in technology-neutral terms; exact technologies and versions are to be recorded from the project's source code and deployment configuration.

TABLE V
SOFTWARE AND HARDWARE REQUIREMENTS

Category	Requirement / note
Client device	Desktop, laptop, tablet or smartphone with a modern browser
Frontend	Responsive HTML/CSS/JavaScript interface or selected framework
Backend	Server-side application framework selected for the implementation
Database	Relational or document database for profiles, questions and progress
AI integration	Optional language-model or recommendation service; provider documented if used
Dev. tools	Version control, editor, test tools and package manager
Connectivity	Network access for hosted deployment and external services

A. Application Modules

TABLE VI
MAIN MODULES OF THE PORTAL

Module	Description
Profile and dashboard	Minimum profile data; summary of quizzes, recent activity, goals and suggested next steps
Aptitude and technical practice	Questions by topic and difficulty; answers compared with verified keys; scores and explanations shown
Resume preparation	Checklist for education, skills, projects, internships, achievements; optional feedback
Interview preparation	Questions by role, subject and competency; rubric-based feedback
Progress tracking	Records activities and quiz outcomes to show change over time
Administration	Question review, topic updates and publication with role checks

The dashboard summarises recorded activity and must not imply a placement probability unless a validated method supports it. Technical practice can include concept questions and, if safe code execution is supported, coding exercises. If a resume is uploaded, the portal explains how the file is processed and who can access it; suggestions focus on clarity, relevance and formatting rather than promising selection. Role checks prevent unauthorised users from modifying content or viewing another student's records.

B. User Interface

The interface uses consistent navigation, readable typography, clear labels and responsive layouts, following accessibility guidance such as WCAG 2.2 [13]. The dashboard displays preparation categories, recent scores, activity history and suggested practice, and forms mark required fields and give actionable errors. Screenshots of the implemented portal are placed in Figs. 3–5 at the end of this paper.

C. Proposed Testing

Table VII lists representative test cases. They are proposed cases, not evidence that testing has passed; the final record should state execution status, test data, observed output and defects fixed.

TABLE VII
PROPOSED TEST CASES

Area	Example test	Expected outcome
Authentication	Valid and invalid credentials	Valid access granted; invalid rejected
Quiz evaluation	Answer known sample questions	Score matches verified key
Progress	Complete a quiz, reopen dashboard	Latest activity shown accurately
Authorisation	Student attempts admin-only action	Action is denied
AI feedback	Submit a sample response	Follows rubric; clearly advisory
Responsive UI	Open at desktop and mobile widths	Content readable and usable

VI. Results and Discussion

This paper reports the design of the portal and a plan for evaluating it. Because no test logs or measured results are available at this stage, numerical outcomes such as accuracy, response time, placement-rate improvement or user satisfaction are intentionally not stated; invented figures would mislead readers. Table VIII defines the measures to be reported once the deployed system has been tested.

TABLE VIII
EVALUATION FRAMEWORK

Metric	How assessed	Evidence to record
Functional pass rate	Passed ÷ executed test cases	Test log and defect list
Quiz score correctness	Computed scores vs. known answer sets	Sample questions and expected scores
Task completion rate	Users completing tasks ÷ users attempting	Usability observation sheet
Feedback quality	Human review against a rubric	Review form and sample outputs
Response time	Request duration under stated conditions	Environment and timing records
User satisfaction	Structured feedback after tasks	Questionnaire and response count

A. Result Analysis Framework

Functional correctness. Each core use case (access, browsing, quiz submission, scoring, progress display and content management) is recorded as working or not, and defects are categorised by severity and retested.

Usability. A small representative group completes tasks such as finding a topic, completing a quiz and locating a suggested next step. Task completion rate, time on task and user-reported clarity are recorded, with participant numbers and conditions stated.

AI feedback quality. Reviewers rate output for relevance, factual correctness, clarity, actionability, fairness and consistency with the rubric, and flag unsupported advice. The number of samples and the scoring procedure are reported before findings are summarised.

B. Illustrative Usage Scenario

The following scenario is illustrative and reports no measured results. A student preparing for software-development roles selects data structures and quantitative aptitude as goals. The portal suggests topics and shows why each was chosen. After a quiz, the dashboard updates and the next suggestions change in line with (1). The student writes an answer to an interview question and receives rubric-based comments labelled advisory, which are reviewed critically before revising. If the AI service is unavailable, a fallback message appears and quizzes, content and dashboard continue to work.

C. Discussion

The main contribution is integration: aptitude, technical, resume and interview preparation share one profile, one activity record and one set of suggestions. Linking repeated practice with specific feedback follows established findings on retrieval practice and feedback [2], [3], while a transparent rule lets students see why a topic is recommended. Treating AI features as optional and advisory limits the effect of model errors on learning.

The value of the system still depends on content quality and coverage and on the activity data recorded. A dashboard shows recorded activity, not job readiness, so conclusions about effectiveness must wait for the documented functional tests, usability feedback and review of AI-assisted output.

VII. ADVANTAGES AND LIMITATIONS

A. Advantages

- One portal replaces scattered resources for aptitude, technical, resume and interview preparation.
- Quizzes with explanations and a visible progress record support repeated practice.
- Suggestions follow a transparent rule and show the reason to the student.
- Core features work without the AI service, and AI output is labelled advisory.
- Role-based access, input validation and data minimisation protect student information.
- Modular design allows new topics, tracks and providers to be added.

B. Limitations

- Suggestion quality depends on content coverage and student activity data.
- AI-generated answers can contain errors and must not replace verified material or human career guidance.
- A dashboard reflects recorded activity; it is not a definitive measure of job readiness.
- Resume and interview feedback can be subjective and vary by role, employer and rubric.
- External AI services may introduce cost, latency, privacy and availability concerns.
- Performance and usability claims cannot yet be made because measured results are pending.

VIII. FUTURE SCOPE

Future work will first execute the evaluation plan and record measured results from functional, usability and AI-feedback reviews. Further extensions include role-specific tracks for software development, data analysis and testing; secure coding assessments with sandboxed execution; mock interviews with optional speech input and output; and improved suggestions from transparent progress rules and selected goals. Additional directions are multilingual and accessible content, institution-level analytics using aggregated data with privacy controls, integration of verified placement announcements through authorised services, and a larger study of the quality, fairness and reliability of AI feedback.

IX. CONCLUSION

This paper presented the AI Powered Placements Preparation Portal, a centralised web platform for placement-oriented learning and practice. By combining topic-wise resources, quizzes, resume and interview preparation, a transparent topic-suggestion rule and a progress dashboard, the portal helps students organise their preparation, and its optional AI-assisted features add guidance under quality checks and privacy safeguards.

Its effectiveness must be established through documented functional tests, usability feedback and review of AI-assisted outputs. No claim of improved placement rates or specific performance percentages is made until supported by such an evaluation.

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PROTOTYPE SCREENSHOTS

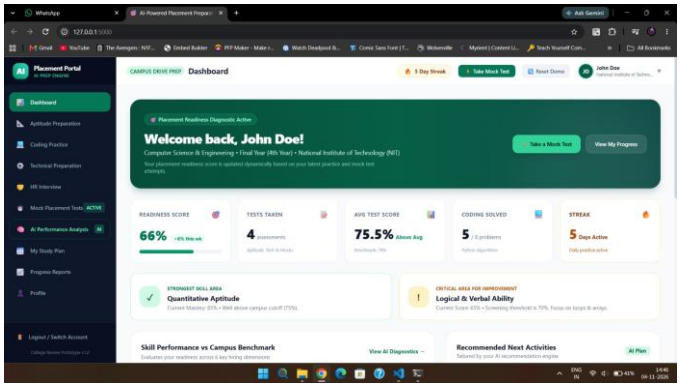


Fig. 3. Student dashboard with progress summary and suggested next steps.

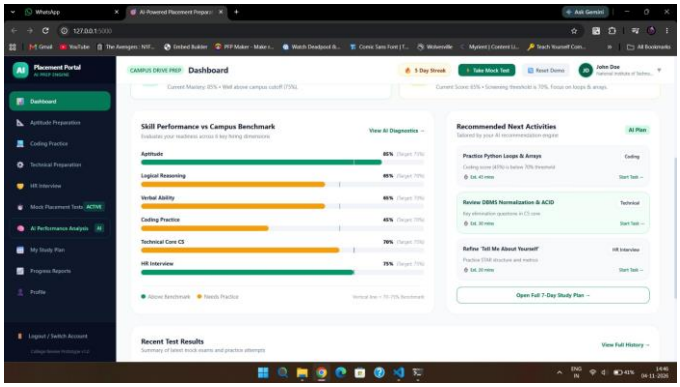


Fig. 4. Skill performance against campus benchmark with recommended next activities.

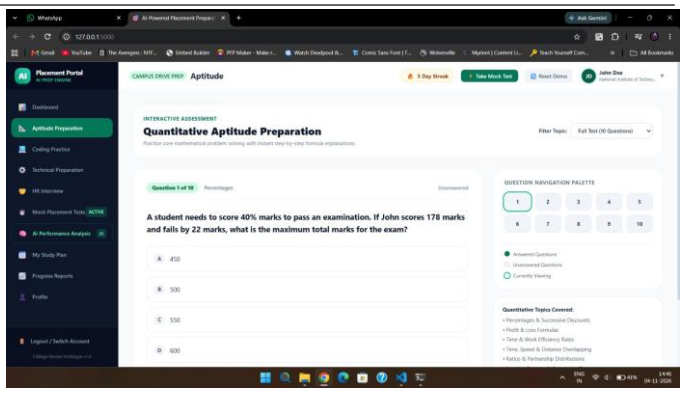


Fig. 5. Quantitative aptitude practice page with question navigation palette.