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Prepto: A Generative AI-based Placement Preparation Platform

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Abstract—Placement is an extremely crucial activity which decides the future of students and job aspirants. However, placement preparation takes place in an extremely disintegrated fashion on multiple forums ranging from aptitude practice websites to coding websites and interview preparation software. In addition to this, resumes of applicants are discarded by the ATS systems of corporations owing to unorganized resume templates and absence of keywords. The paper introduces a Generative AI-based Placement Preparation Platform that is an amalgamation of ATS Resume Analysis Systems, Artificial Intelligence-based Mock Interviews, Coding Analysis, Mock Tests, and Career Assistance. The platform developed customized real-time responses using Gemini 2.0 Flash, Speech To Text modules, and TensorFlow.js. The proposed system helps students enhance resume optimization, layer-wise interview preparation, and career alignment to fill the gap between academics and industries. The paper highlights the structure, approach, development, and business feasibility of the proposed platform, thus improving placement opportunities for students and early professionals.

Keywords—Generative AI, Placement Preparation, Resume Analysis, Applicant Tracking System (ATS), Mock Interviews, Career Guidance

I. Introduction

Over the past few years, there has been rapid increase in the use of Artificial Intelligence (AI) technology, which has resulted in a major change in the process of selection and placement preparation. Currently, organizations prefer the use of automated selection tools, internet-based test assessments, or data-driven tests to narrow down the pool to eligible candidates. It is, therefore, essential that students and fresh graduates prepare themselves for tests according to their skills, knowledge, as well as Automated Tracking Systems (ATS) and interviews.

Despite the availability of a host of options on the internet today for practicing aptitude, coding problems, and mock interviews, placement preparation is still very disintegrated. As it is now, aspiring candidates have different solutions for making resumes, making resumes for applicant tracking systems, doing mock interviews, and more. But then again, many fitting candidates get filtered out in the initial screening round of recruitment for recruitment based on a resume which is unrelated to applicant tracking systems rather than a lack of skills.

In this scenario, for the elimination of these challenges, this study proposes the following Generative AI-based Placement Preparation Platform that amalgamates the following ATS-based resume analysis methods based on the resume, the intelligent-based resume creation methods based on the resume, AI-based simulation methods for interviews assisted by AI, coding and aptitude tests based on the resume, and the career consulting methods based on the resume with the capability for adaptive assessment methods for ideal placement preparation assistance and the transition from education to industry requirements.

II. RELATED WORK

In recent years, professionals in different fields such as human resource management, resume optimization, and job interview preparation have been using artificial intelligence.

A. AI in Recruitment Systems:

In many research papers, it has been observed that a considerable portion of recruitment outcomes has been taken care of by Applicant Tracking Systems. In one such study carried out by Gupta & Sharma (2022), key filtering was pointed out to eliminate more than 70% of resumes before screening them with humans. Hence, resume builders using AI as per job descriptions have been encouraged.

B. Generative AI for Career Readiness:

Recent research by Zhang in 2023 involving large language models for adaptive career training, and by Brown et al. In 2020, has enabled the possibility for the generation of auto-questions, personalized mock interviews, and analysis of talent gaps. These studies have shown the vast potential for AI for feedback in a particular domain.

Currently available platforms like LeetCode, HackerRank, and InterviewBit concentrate almost entirely on coding, with little consideration for preparing students in an all-rounded

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fashion, including but not limited to resume analysis, mock interview preparation with HRs, and guidance. Other platforms include VMock and others that focus exclusively on resume ranking with no capacity for mock interviews.

C. AI-Powered Interview Preparation Tools:

Mohan & Arora (2021) studied the use of AI-based tools that have the capacity to assess communication skills, fluent delivery, and technical competence. However, these tools are not able to be adaptable using the function only based on the predetermined data sets. Gemini-based approaches enable the smart follow-up question based on context consideration.

D. G Identified:

Current offerings cater only to a niche audience with no overlap. They may entirely focus on training students concerning resume optimization, programming skills, and aptitude skills, providing no service that gives an amalgamation of various features such as assessment scores of an ATS, Resume creation software, mock interviews for technical and HR, aptitude skills and programming skills assessment tests, and career counselling.

III. METHODOLOGY

The proposed Generative AI-Based Placement Preparation Platform could be designed as follows, combining resume analysis, interview preparation, skill measurement, and career advice activities into a single process in this way:

A. Workflow:

Users are able to authenticate securely through Firebase Authentication and are then led to a customized dashboard that shows their progress and performances that are stored in Firestore.

In terms of resume analysis, users would require inputting their resume, along with a job description for which the resume analysis needs to be performed. Then, there's Gemini 2.0 Flash, which analyzes a resume according to relevance to keywords, formatting, etc., in order to provide a compatibility score for an ATS resume. They also offer an artificial intelligence-powered resume builder tool where a user's input can be turned into an ATS-friendly resume.

The mock interview component mimics actual interview settings conducted in three rounds. Under the technical interview, the responses given by the user are recorded through Speech-to-Text APIs, and the AI system is responsible for providing adaptive follow-up questions. Under the coding interview, the coding solutions for problems are evaluated for accuracy and optimization, while under the HR interview, the responses are analyzed for relevance to predefined behavioral interview questions.

It also provides simulation tests for aptitude, reasoning, automata, English comprehension, essay writing, and personality analysis. The objective answers are automatically evaluated, and the subjective answers are evaluated through Generative AI.

Lastly, the career guidance module is capable of aggregating all the performance data gathered for the user and proposing relevant job positions and career paths.

B. System Architecture

The system follows a client-server architecture comprising frontend (HTML, CSS, JavaScript), backend (Node.js with Express.js), authentication and database (Firebase Authentication and Firestore), AI model (Gemini 2.0 Flash), integration (Speech-to-Text APIs), and deployment (GitHub and Render).

IV. IMPLEMENTATION

The Gen AI-Based Placement Preparation Platform is developed in a modular, scalable fashion that will make it possible to seamlessly integrate with AI services and also make it easily extensible in the future. The proposed design divides the entire system into four different layers – frontend, backend, database, and AI integration.

HTML, CSS, and JavaScript have been utilized for developing the frontend to have a responsive user interface. There is a common dashboard provided, which acts as a hub or point of interaction for all activities, where customers avail services related to resume analysis on ATS, AI-generated resume development, tracking, mock interviews, mock tests, and guidance related to careers.

The backend has been built using Node.js with Express.js, which handles authentication functionality, API mapping, sessions, as well as module integration. Meanwhile, the authentication service delivered by Firebase Authentication handles authenticated access securely, while a cloud database like Firestore handles storage of user profiles, resumes, result scores for assessments, along with interview feedback on a real-time database.

For intelligent processing, the system uses Gemini 2.0 Flash, the core generation model, as an integrated platform. It offers the capabilities of context-aware resume evaluation, adaptive interview question formulation, coding problem assessment, and evaluation of HR feedback. Moreover, Speech-to-Text APIs are used for voice response evaluation in the interview process.

The ATS Resume Analysis tool matches resumes to job descriptions based on keyword gaps and structural problems in the resumes. The AI-driven Resume Builder is a tool that assists in creating ATS-friendly resumes based on specified job roles.

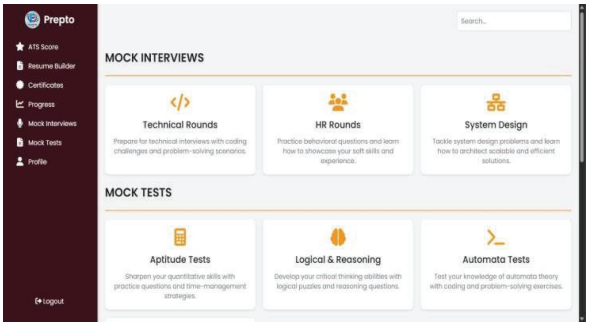

Fig. 1. Dashboard of the platform

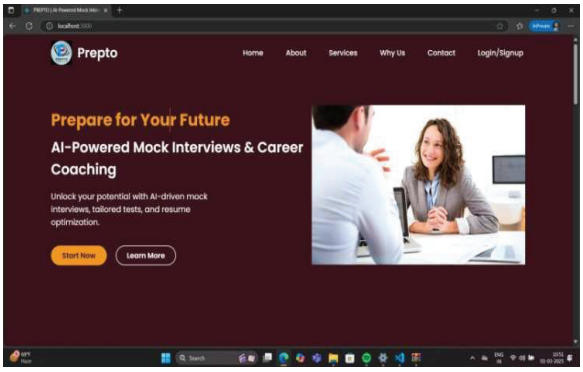

Fig. 2. Homepage of the platform

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V. BUSINESS MODEL

The Gen AI–based Placement Preparation Platform follows a freemium hybrid business model in order to serve both its individual users and institutional clients most effectively. The freemium approach ensures widespread accessibility in that some of the core features, like ATS compatibility scoring and a limited amount of AI-driven mock interviews, come free of cost. This reduces the entry barrier for students and early professionals, increasing their incentives to use and engage with the platform.

To support users seeking deeper and continuous preparation, premium subscription plans are available. Advanced functionalities include, but are not limited to, unlimited AI-powered mock interviews, in-depth ATS and resume analysis, role-specific resume optimization, personalized career assessment, and comprehensive performance analytics. These aspects will provide a way forward in the systematic and long-term preparation of placements in accordance with changing industry and recruitment trends.

In addition to the individual users, the platform has been strategically placed to provide its services to institutional users, including universities, training institutes, and placement agencies. This includes the extension of the enterprise subscription model, which includes bulk subscription for students, as well as institutional-level dashboards for the institution itself. The latter will help the institution in keeping track of student performance analysis, analyzing their placement readiness, and more, thus enhancing the effectiveness of the campus placement cell and training institutes of the institution itself.

The platform will generate revenues through diversified streams:

- Individual Subscriptions, which include monthly and yearly billing cycles.
- Institutional and Corporate Partnerships, which include training and education institutions.
- Strategic Partnerships, which include online job portals, which will help in real-time application tracking, recruiter synchronization, and enhancing career analytics.
- The course will include AI-based mentorship programs, which will include premium career services, including personalized coaching, in-depth interview feedback reports, and more.

The future prospects with regard to growth in the industry may also include the creation of specific modules for specific domains like 'Technology,' 'Finance,' 'Consulting,' 'Healthcare,' etc. Integration with job portals can also aid in developing more sophisticated AI-based mentor-ship programs.

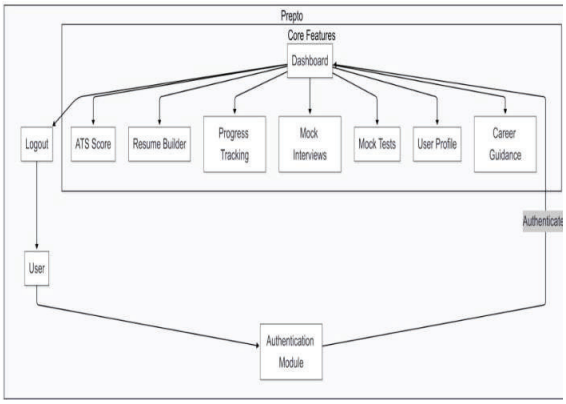

Fig. 3. System Architecture of the platform

VI. RESULTS / EXPECTED OUTCOMES

The proposed Gen AI-Based Placement Preparation Platform has shown improvements in key areas with regard to placement preparation, which includes resume preparation, interview preparation, aptitude performance, and career clarity.

A. Resume Quality:

The results of evaluations of the ATS module reveal that by resume optimization, an average improvement of 40 to 60 percent in ATS compatibility scores has been seen by users.

B. Mock Interviews:

Adaptive questioning systems based on artificial intelligence helped optimize candidate answers by diminishing stress levels during simulated technology and human resource-related interviews.

C. Coding Assessments:

Instant feedback aid in improving the problem-solving ability and bug-fixing capability by providing assistance in error detection in the logic to be optimized.

D. Aptitude Tests:

AI-assessed mock tests and continuous practice showed a marked improvement in numerical, logical, and verbal reasoning skills with a statistically significant improvement in scores.

E. Career Guidance:

A career guidance module was able to identify the user's skill set and associate them with appropriate roles, offering genuine salary information, analysis of skill gaps, and direction on personalized career options.

F. Pilot Testing Outcomes :

The pilot testing of the platform showed the following results:

- Shortlisting of resumes was optimized by about 50% relative to ATS-based systems.
- Self-perceived confidence during interviews rose by almost 40%, largely due to repeated simulation practices with aid of AI.
- Participating institutions saw an increase in placement ratios, establishing the success of this platform.

These points are further supported by figures 1, 2, and 3, which display the homepage of the platform, the users' dashboards, and system designs, respectively, and further clarify the viability of the system proposed.

VII. DISCUSSION

The effectiveness of the proposed Gen AI-Based Placement Preparation Platform is evident in the result analysis. Previously, job seekers had to use a variety of standalone platforms for aptitude test practice, programming challenges, resume development, and interview sessions. The unorganized pattern in placement preparation may result in unorganized performance and lack of progress monitoring. Moreover, it fails to comply with industry standards of placement in terms of ATS-based screening processes. The proposed solution removes these issues as it provides a fully automated platform in a single domain for all the necessary placement preparation tasks.

One of the major insights gained through the implementation is that the system has increased the quality and compatibility of the resumes with the ATS. This is because the system assesses the resumes based on the job description and recommends the relevant format and key words that help candidates improve their chances of being short-listed.

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It further improves interview readiness by providing the candidate with simulated interviews using AI, which are based on actual technical, coding, and human resources interviews. Adaptive questioning, voice response assessment and feedback help the candidate to improve the clarity, confidence and communication of the response. By getting exposed to such simulations again, the candidate can overcome the fear of interview. Regarding the skill assessment, coding assessment reviews and aptitude tests with real time feedback help to improve efficiency and understand of problem solution. The mention of performance tracking over time also helps the candidates to understand their improvement and focus on the improvement areas. This kind of training and practice method is very helpful to the candidates compared to the traditional training and practice without any feedback.

The addition of the career guidance feature is also helpful for the system. This feature maps the skills provided by the user to job titles, salaries and career paths. This feature is helpful to the candidate because the candidate usually has doubts about which career to opt for and what skills to possess.

From the institutional point of view, it may be clearly stated that it is a scaleable system in nature. It would definitely help the institution/Placement Cells to keep an eye on the preparations by making use of a dashboard. It may be clearly stated that it is an extensible system in nature, which means it may be extended even further by incorporating features like interview, jobs portal, AI-based mentoring, etc.

In Conclusion, From the above explanation given in this section, it may be clearly inferred that there is immense potential in this proposed system to bring in a holistic approach to the preparations made by the students. The system would definitely help in avoiding the dependencies on individual tools and bring in the concept of smart automation to make it an efficient system in pre-placement preparations with higher levels of candor in the candidates, along with the focus on academic learning patterns with reverence to industry recruitment trends.

VIII. CONCLUSION

To address the fragmented nature of placement preparation, and hence align the levels of candidate readiness with respect to placement preparation with contemporary levels of recruitment, the proposed work focused on the implementation of a Placement Preparation Platform using Generative AI. The Placement Preparation Platform includes a range of activities like optimizing resumes for ATS, conducting mock interviews with AI, coding tests, and aptitude tests.

The result of these experiments indicates an improvement in the quality of resumes, confidence levels during interviews, coding speeds, and placement preparedness. In addition, pilot testing indicates an improvement in the shortlisting of resumes as well as placement success at an institutional level, thus justifying the relevance of the proposed system. In addition, there is a flexibility and scalability feature that will allow it to accommodate future developments in AI.

Going forward, there is a huge scope to improve this platform by integrating various job portals around the world, which can allow direct applications to a job after fulfilling ATS standards. Adding professional interview tests in domains like finance, consulting, etc., can add more to domain expertise on this platform. Additionally, AI-based mentorship and career development platforms, which can provide human wisdom along with AI-based inputs, can further enhance domain expertise on this platform. Going forward, employability solutions around the world can make it a ‘one-stop’ platform for employability solutions around the world.

In conclusion, the proposed system can be considered an important step towards a more ‘smart,’ ‘inclusive,’ and ‘goal-oriented’ placement preparation system. In addition to that, it has huge potential to enhance employability in the current competitive world with AI-integrated jobs.

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