

“GenHire AI: An Intelligent Placement and Interview Automation System”

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Abstract: The rapid growth of digital recruitment has created the need for intelligent systems capable of automating candidate screening, interview management, and placement assistance. Traditional recruitment processes are often time-consuming, manually intensive, and prone to human bias, making it difficult for organizations and educational institutions to efficiently identify suitable candidates. To address these challenges, this research paper proposes “GenHire AI: An Intelligent Placement and Interview Automation System”, an AI-driven platform designed to modernize and optimize the hiring and placement process. The proposed system integrates Generative AI, Natural Language Processing (NLP), and Machine Learning techniques to analyze candidate profiles, identify skills, recommend suitable job roles, and generate personalized interview questions automatically. The platform also provides AI-based mock interview assistance, candidate performance evaluation, and intelligent feedback to enhance placement preparation and recruitment efficiency. The system aims to reduce recruitment time, improve candidate-job matching accuracy, and support data-driven hiring decisions while minimizing manual effort and bias. Additionally, the proposed model can be effectively implemented in colleges, universities, placement cells, and corporate recruitment environments to streamline hiring operations and improve placement success rates.

Keywords: Generative AI, Artificial Intelligence, Smart Recruitment, Placement System, Interview Automation, Machine Learning, NLP, Candidate Evaluation, Hiring Automation.

1. INTRODUCTION

In today’s digital era, the recruitment and placement process has become more competitive and challenging for both organizations and job seekers. Companies receive a large number of applications for a single job role, making manual screening and candidate evaluation difficult and time-consuming. Similarly, students and job applicants often face problems in identifying suitable job opportunities, preparing for interviews, and improving their skills according to industry requirements.

Traditional recruitment systems mainly depend on manual resume verification, aptitude tests, and interview procedures, which require significant human effort and may sometimes lead to inaccurate candidate selection or recruitment bias. Due to the rapid growth of Artificial Intelligence (AI) and automation technologies, organizations are now shifting towards intelligent recruitment solutions that can improve efficiency, reduce workload, and enhance hiring accuracy.

To address these challenges, this research proposes “GenHire AI: An Intelligent Placement and Interview Automation System”, a smart AI-driven platform designed to automate and optimize the placement and recruitment process. The proposed system uses Generative AI, Natural Language Processing (NLP), and Machine Learning techniques to analyze candidate information, identify technical and soft skills, recommend suitable job roles, and generate personalized interview questions automatically.

The system also provides AI-based mock interview support, candidate performance evaluation, and intelligent feedback mechanisms to help students improve their placement preparation. By integrating intelligent automation into recruitment activities, the proposed platform aims to reduce recruitment time, improve candidate-job matching accuracy, and support better hiring decisions for organizations and educational institutions.

This research highlights the importance of AI-powered recruitment systems in modern hiring environments and demonstrates how Generative AI can transform traditional placement procedures into smart, efficient, and scalable recruitment solutions for the future.

2. LITERATURE SURVEY

The recruitment and placement industry has experienced significant transformation due to the rapid development of Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), and Generative AI technologies. Traditional recruitment methods mainly depend on manual resume screening, aptitude testing, and face-to-face interviews, which require considerable time, human effort, and operational cost. With the increasing number of job applicants and the growing demand for skilled candidates, organizations and educational institutions are adopting intelligent recruitment systems to improve efficiency, accuracy, and candidate selection processes.

Several researchers have proposed AI-based recruitment systems capable of automating candidate screening and shortlisting procedures. These systems use Machine Learning algorithms to analyze candidate profiles, compare qualifications with job descriptions, and identify suitable applicants. Research studies indicate that automated recruitment systems can reduce hiring time and improve decision-making accuracy compared to traditional manual methods. However, many existing systems focus mainly on basic filtering and ranking functionalities without providing personalized interview preparation or intelligent feedback mechanisms.

Natural Language Processing (NLP) has also played an important role in modern recruitment systems. NLP-based approaches are commonly used for resume parsing, keyword extraction, skill identification, and profile classification. These systems help Applicant Tracking Systems (ATS) automatically evaluate candidate documents and match them with job requirements. Researchers found that NLP techniques improve resume analysis accuracy and reduce manual errors during recruitment. Despite these advantages, most NLP-based systems are limited to document processing and lack complete placement support and interview automation features.

Machine Learning-based recommendation systems have been widely implemented to improve candidate-job matching processes. These systems use classification algorithms, similarity matching, and predictive analytics to recommend suitable job opportunities according to candidate skills, educational background, and interests. Studies demonstrate that intelligent recommendation systems can enhance placement success rates and reduce mismatches between employers and candidates. However, many existing recommendation platforms do not include AI-powered interview assistance or candidate performance evaluation modules.

In recent years, Generative AI technologies such as GPT-based language models have introduced new possibilities in recruitment automation. Researchers have explored the use of Generative AI for automated interview question generation, conversational interview simulations, chatbot-based candidate interaction, and personalized career guidance. These systems can dynamically generate technical, HR, and behavioural interview questions according to candidate profiles and job roles. Research findings suggest that AI-generated interview systems improve candidate preparation and create more interactive recruitment experiences. Nevertheless, current systems often lack integration with placement management platforms and fail to provide complete recruitment workflow automation.

Identified Problems

Based on recruitment challenges, student placement activities, and analysis of existing hiring platforms, the following major problems were identified:

1. Manual Recruitment and Screening Process

Many organizations and placement cells still depend on manual candidate screening and profile verification processes. This consumes significant time and effort, especially when handling a large number of applications during recruitment drives.

2. Lack of Personalized Interview Preparation

Most students and job seekers do not receive personalized interview guidance according to their skills, academic background, and target job roles. Existing systems provide only general preparation material without adaptive learning support.

3. Inefficient Candidate-Job Matching

Current recruitment systems often fail to accurately match candidates with suitable job roles based on their technical skills, interests, qualifications, and career preferences. This may lead to inappropriate hiring decisions and lower placement success rates.

4. Dependence on Traditional Recruitment Methods

Many recruitment processes still rely heavily on manual HR evaluation, written tests, and conventional interview procedures, which increase workload and reduce recruitment efficiency.

5. Lack of Intelligent Interview Automation

Existing recruitment platforms mainly focus on application management and resume filtering but do not provide AI-based interview question generation, automated mock interviews, or intelligent candidate evaluation systems.

6. Limited Real-Time Feedback Mechanisms

Most current systems do not provide immediate feedback or performance analysis after interviews or placement activities. As a result, candidates face difficulties in identifying their weaknesses and improving their skills.

7. Difficulty in Skill Gap Identification

Students often remain unaware of the technical and soft skills required for specific job roles. Existing placement systems rarely provide intelligent skill-gap analysis and career improvement recommendations.

8. Absence of a Unified Smart Recruitment Platform

There is no centralized AI-driven platform that integrates candidate analysis, placement assistance, interview automation, skill evaluation, and feedback mechanisms into a single system. This creates difficulties in managing the complete recruitment workflow efficiently.

Proposed Solution

To address the above problems, an intelligent AI-based recruitment platform called “GenHire AI: An Intelligent Placement and Interview Automation System” is being developed.

1. Allow candidates to enter academic details, technical skills, certifications, projects, and career preferences.
2. Analyze candidate profiles using Artificial Intelligence, Machine Learning, and NLP techniques.
3. Recommend suitable job roles and placement opportunities based on candidate skills and qualifications.
4. Generate personalized technical, HR, and behavioral interview questions automatically using Generative AI.
5. Conduct AI-based mock interviews and evaluate candidate performance.
6. Provide real-time feedback, skill-gap analysis, and improvement suggestions for better placement preparation.
7. Display recruitment recommendations and interview analysis results in a structured and user-friendly format.
8. Maintain all placement, recruitment, and candidate evaluation information on a single centralized platform.

With this solution, students and recruiters will no longer need to depend completely on manual screening and traditional recruitment processes.

The proposed system will provide intelligent placement assistance, interview automation, and candidate evaluation instantly through a smart AI-driven platform.

2.1 AI-Based Placement and Interview Automation System [2]

The recruitment and placement process in educational institutions and organizations has become increasingly challenging due to the growing number of applicants and the rising demand for skilled candidates. Traditional recruitment methods mainly depend on manual resume screening, aptitude tests, and interview procedures, which require significant

time, effort, and human involvement. In many cases, recruiters face difficulties in evaluating large numbers of candidate profiles efficiently, while students often struggle to prepare for interviews and identify suitable job opportunities according to their skills and qualifications. To overcome these challenges, the concept of an AI-based placement and interview automation system has emerged as an effective digital solution for modern recruitment management.

An AI-based recruitment system works by integrating Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Generative AI technologies into a centralized platform. Instead of depending completely on manual recruitment activities, the system automatically analyzes candidate profiles, identifies technical and soft skills, and compares them with job requirements. Candidates provide information such as academic qualifications, technical skills, certifications, project details, and career interests, while the system processes this data intelligently to recommend suitable job opportunities and placement options.

One of the major features of such systems is automated interview assistance. Using Generative AI technologies, the platform can dynamically generate technical, HR, and behavioral interview questions based on candidate profiles and target job roles.

2.2 Digital Transformation in Recruitment and Placement Support Systems

In recent years, digital transformation has significantly influenced the recruitment and placement sector, particularly in candidate evaluation, interview management, and hiring support services. The increasing number of job applicants, expanding industry requirements, and growing competition in the employment market have made it difficult for recruiters and students to manage placement activities efficiently. This study focuses on the role of Artificial Intelligence and digital technologies in improving recruitment support systems and simplifying the hiring process through intelligent online platforms.

The research highlights how AI-based recruitment systems help candidates and organizations access centralized information related to job opportunities, skill requirements, interview preparation, and placement guidance. Unlike traditional recruitment methods that rely heavily on manual screening and conventional interview procedures, intelligent digital platforms provide an integrated environment where candidates can enter their academic details, technical skills, certifications, and career preferences to receive personalized job recommendations and interview assistance. The data for this study was collected through analysis of existing recruitment platforms, candidate feedback surveys, and review of current AI-driven hiring technologies.

The results indicate that digital recruitment support systems improve recruitment efficiency, transparency, and candidate-job matching accuracy. Candidates are able to identify suitable job opportunities, prepare for interviews, and evaluate their placement readiness more effectively. The structured presentation of recruitment related information reduces confusion and helps applicants improve their technical and communication skills through AI-based feedback mechanisms. Furthermore, the study shows that centralized recruitment systems assist organizations and placement cells in managing large volumes of candidate applications and interview processes in a more systematic and organized manner.

The findings of this research contribute to the development of technology-driven recruitment services by emphasizing the importance of intelligent and user-friendly digital platforms in modern hiring environments. Such systems provide valuable support not only to candidates but also to recruiters, educational institutions, and placement organizations by streamlining recruitment workflows and improving communication between stakeholders. Overall, digital transformation in recruitment and placement management plays a crucial role in promoting efficient, transparent, and accessible employment opportunities for students and job seekers.

2.3 Development of an AI-Based Placement and Interview Automation Platform

With the increasing use of Artificial Intelligence and digital technologies in the recruitment sector, intelligent placement and interview automation platforms have become essential tools for improving hiring efficiency and candidate preparation. Many students and job seekers face difficulties in identifying suitable job opportunities, understanding industry skill requirements, and preparing effectively for interviews due to scattered recruitment information and lack of personalized guidance. To address this issue, an AI-based placement and interview automation platform can be developed to provide centralized and intelligent recruitment support to candidates and organizations. Such a system allows users to enter their academic details, technical skills, certifications, and career interests, and then processes this information using Artificial Intelligence, Natural Language Processing (NLP), and Machine Learning techniques to recommend suitable job roles and placement opportunities. The platform can also generate personalized interview questions and provide AI-based

mock interview assistance with real-time feedback. This approach improves recruitment transparency, reduces manual effort, and supports better candidate-job matching. Furthermore, the platform enhances accessibility by providing a user-friendly interface and structured recruitment information in a single system. Overall, the development of an AI-based placement and interview automation system contributes to efficient recruitment management, improves placement preparation, and promotes technology-driven hiring processes for modern organizations and educational institutions.

2.4 Research Gap

From the review of existing studies and recruitment platforms, it is observed that many systems mainly focus on basic candidate screening, resume analysis, or general job recommendations. However, these approaches often lack complete integration of placement assistance, interview automation, and intelligent candidate evaluation within a single platform. Additionally, several existing recruitment systems depend heavily on manual processes, which increase recruitment time, operational complexity, and the possibility of human bias during candidate selection.

Many current platforms also use advanced AI technologies but fail to provide user-friendly and accessible solutions for students, educational institutions, and recruiters. In several cases, recruitment information, interview preparation resources, and job recommendations are scattered across different platforms, making the placement process confusing and less efficient for candidates. Furthermore, limited attention has been given to developing systems that combine Generative AI, Machine Learning, and Natural Language Processing (NLP) for personalized interview generation, skill-gap analysis, and real-time performance feedback.

There is a lack of centralized AI-based recruitment platforms that can intelligently analyze candidate profiles, recommend suitable job opportunities, conduct automated mock interviews, and provide structured placement support through a single system. Therefore, there is a need to develop an intelligent placement and interview automation platform that simplifies recruitment management, improves candidate-job matching accuracy, reduces manual effort, and supports efficient and transparent hiring processes using modern AI technologies.

3. Proposed Methodology

The proposed system is designed as an AI-based placement and interview automation platform that helps students and job seekers identify suitable job opportunities and improve their interview preparation through intelligent digital support. The methodology focuses on collecting candidate input data such as academic qualifications, technical skills, certifications, project details, and career interests. This information is processed using Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Generative AI techniques integrated into a centralized recruitment platform.

The system performs intelligent candidate analysis and compares user profiles with predefined job requirements and recruitment criteria stored in the database. Based on this analysis, the platform generates suitable job recommendations and placement opportunities according to candidate skills and qualifications. The system also provides AI-generated technical, HR, and behavioral interview questions to support interview preparation and skill development.

Additionally, the platform includes features such as AI-based mock interviews, real-time performance feedback, skill-gap analysis, and recruitment information display to improve candidate readiness for placement activities. The development process includes database design, user interface implementation, AI model integration, recruitment logic development, and system testing to ensure accurate results and user-friendly operation.

This structured methodology aims to simplify recruitment management, reduce manual effort, improve candidate-job matching accuracy, and enhance placement preparation through an efficient AI-driven digital solution.

3.1 System Architecture

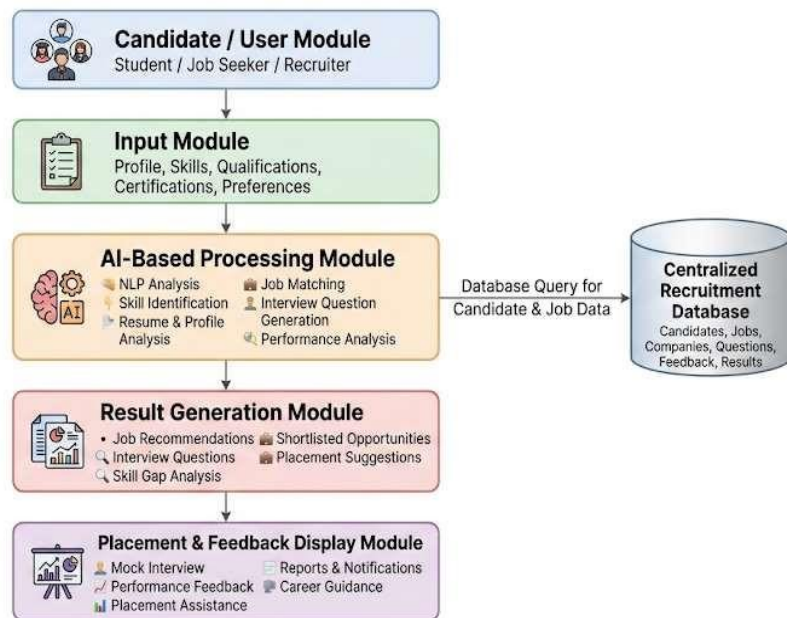
The system architecture of the proposed "GenHire AI: An Intelligent Placement and Interview Automation System" is designed to provide a structured, intelligent, and efficient platform for recruitment management, candidate evaluation, and interview automation. The architecture mainly consists of three major components: the user interface layer, the application processing layer, and the database layer. The user interface allows candidates and recruiters to register, log in, and access different recruitment-related services. Candidates can enter their academic details, technical skills, certifications, project information, and career preferences, while recruiters can manage job postings and recruitment activities through the platform.

The entered information is transferred to the application processing layer, where Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Generative AI techniques are applied. The system analyzes candidate profiles, identifies technical and soft skills, and compares them with predefined job requirements stored in the centralized database. Based on this intelligent analysis, the platform generates suitable job recommendations and placement opportunities for candidates. The system also supports AI-based interview automation by generating technical, HR, and behavioral interview questions dynamically according to candidate profiles and target job roles.

The database layer plays an important role in storing candidate records, job descriptions, interview data, recruitment information, and system-generated evaluation reports in an organized manner. This centralized database structure helps maintain accurate recruitment data and ensures efficient communication between different system modules. The architecture is designed in a layered and modular format to support smooth data flow, easy maintenance, and improved system performance.

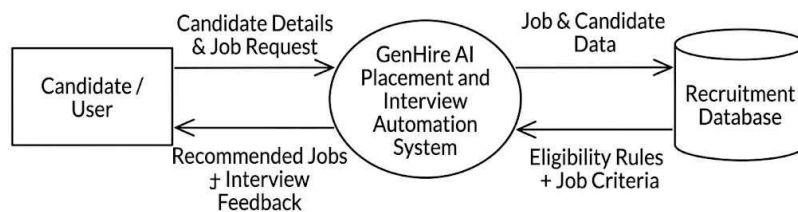
3.1 Architecture Diagram of GenHire AI Placement and Interview Automation System

GenHire AI: An Intelligent Placement and Interview Automation System



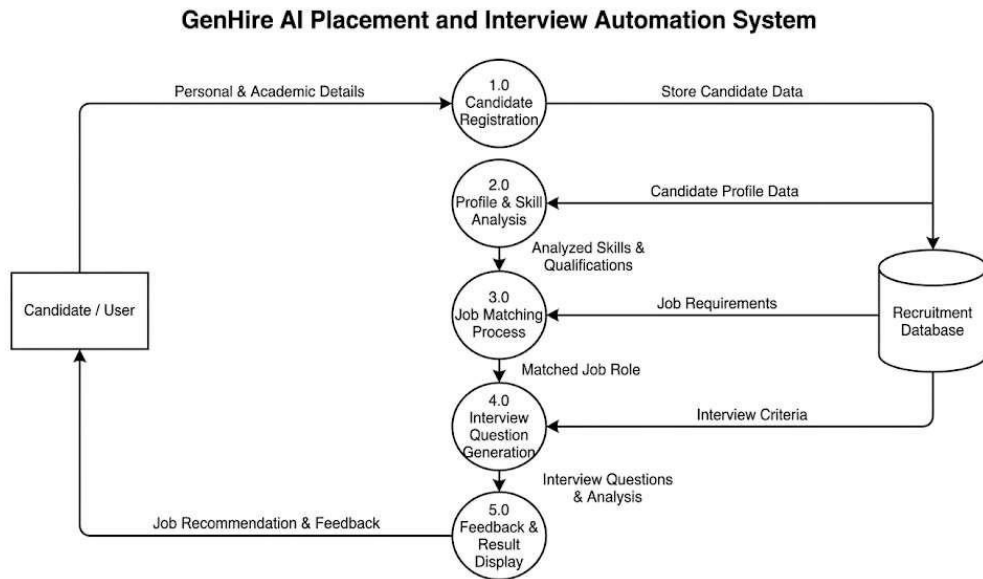
3.1 Architecture Diagram of GenHire AI: An Intelligent Placement and Interview Automation System

3.2 Level-0 DFD of GenHire AI System



3.2: Level-0 DFD for Placement and Interview Automation System

3.3 Level-1 Data Flow Diagram (DFD)



3.3: Level-1 DFD of GenHire AI System

3. Implementation

The implementation of the proposed “GenHire AI: An Intelligent Placement and Interview Automation System” focuses on developing a user-friendly and intelligent digital platform that assists candidates and recruiters in managing placement and recruitment activities efficiently. The system is implemented using web-based technologies that support candidate data collection, AI-based processing, job matching, interview automation, and result generation in a structured manner. Initially, a centralized recruitment database is created to store candidate profiles, job descriptions, interview criteria, company information, feedback records, and recruitment-related data. The front-end interface is designed to allow candidates and recruiters to easily register, log in, and access various recruitment services through a simple and interactive platform.

The core functionality of the system is developed using Artificial Intelligence, Machine Learning, Natural Language Processing (NLP), and Generative AI techniques that analyze candidate profiles and compare them with predefined job requirements stored in the database. Based on this intelligent analysis, the system generates suitable job recommendations, placement opportunities, and personalized interview questions according to candidate qualifications and skills. Additional features such as AI-based mock interviews, skill-gap analysis, performance feedback, and recruitment result display are also implemented to support placement preparation and improve hiring efficiency.

4. System Interface and Output Screens

1. Admin Dashboard of GenHire AI Placement and Interview Automation System:

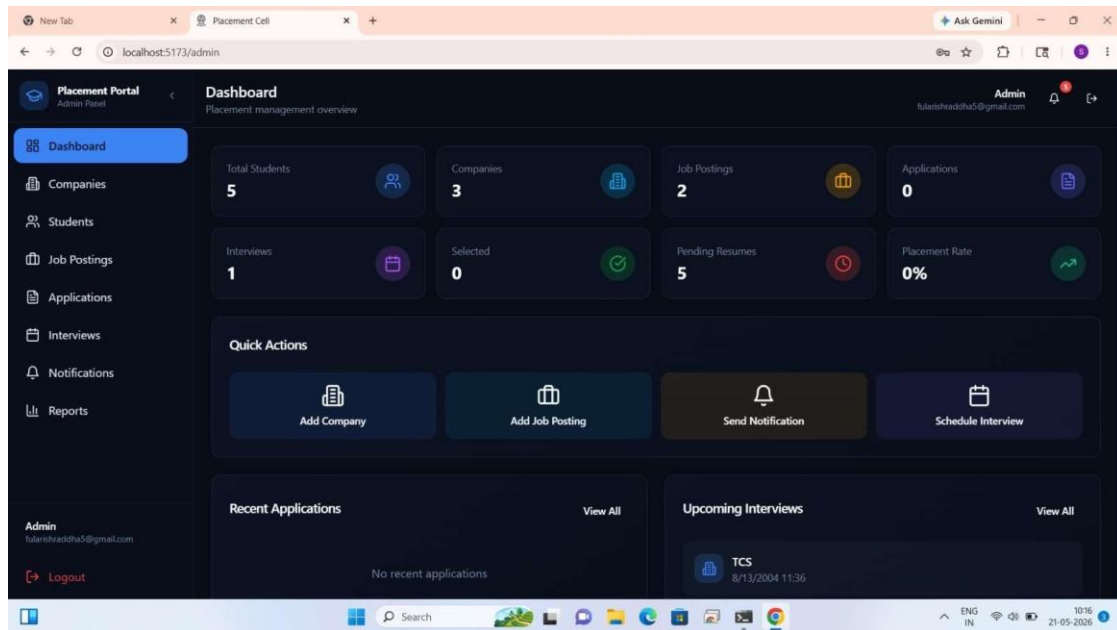


Figure 4.1: Admin Dashboard of GenHire AI Placement and Interview Automation

System 2. Student Management Module of GenHire AI Placement and Interview Automation System

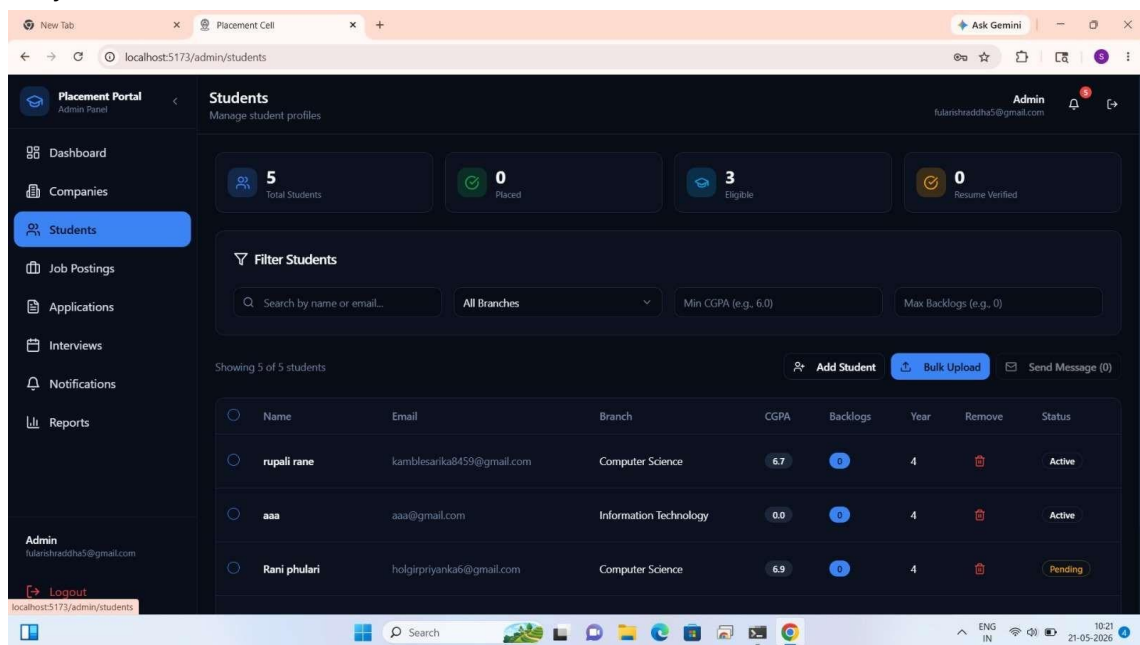


Figure 4.2: Student Management Dashboard of GenHire AI System

3. AI Interview Practice Module of GenHire AI Placement and Interview Automation System:

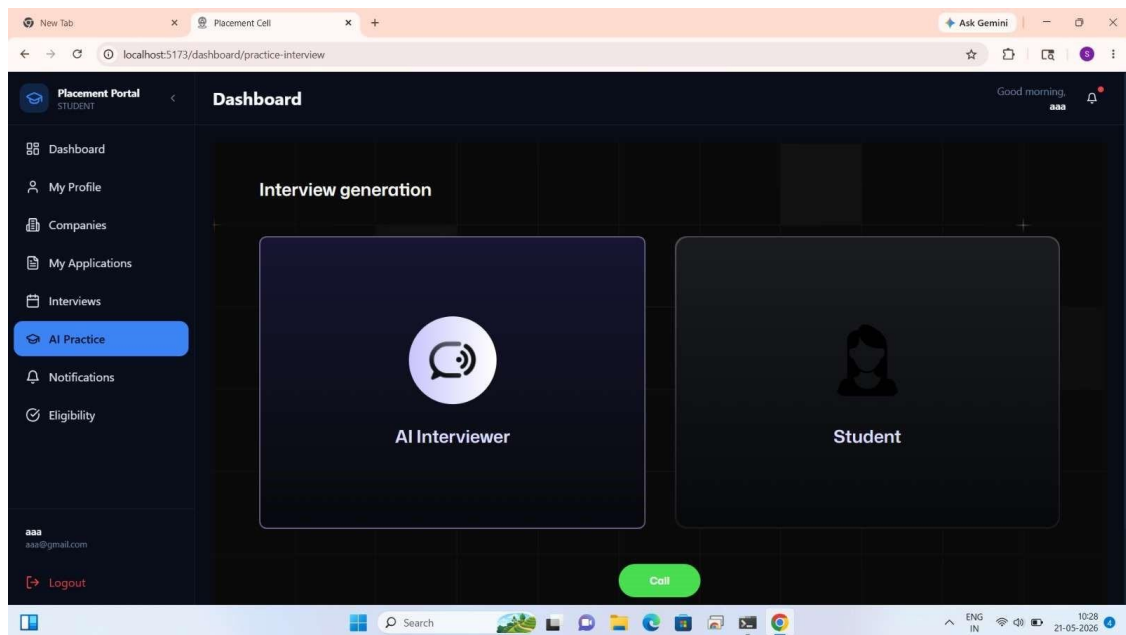


Figure 4.3: AI Interview Practice Dashboard of GenHire AI System

4. Interview Management Module of GenHire AI Placement and Interview Automation System

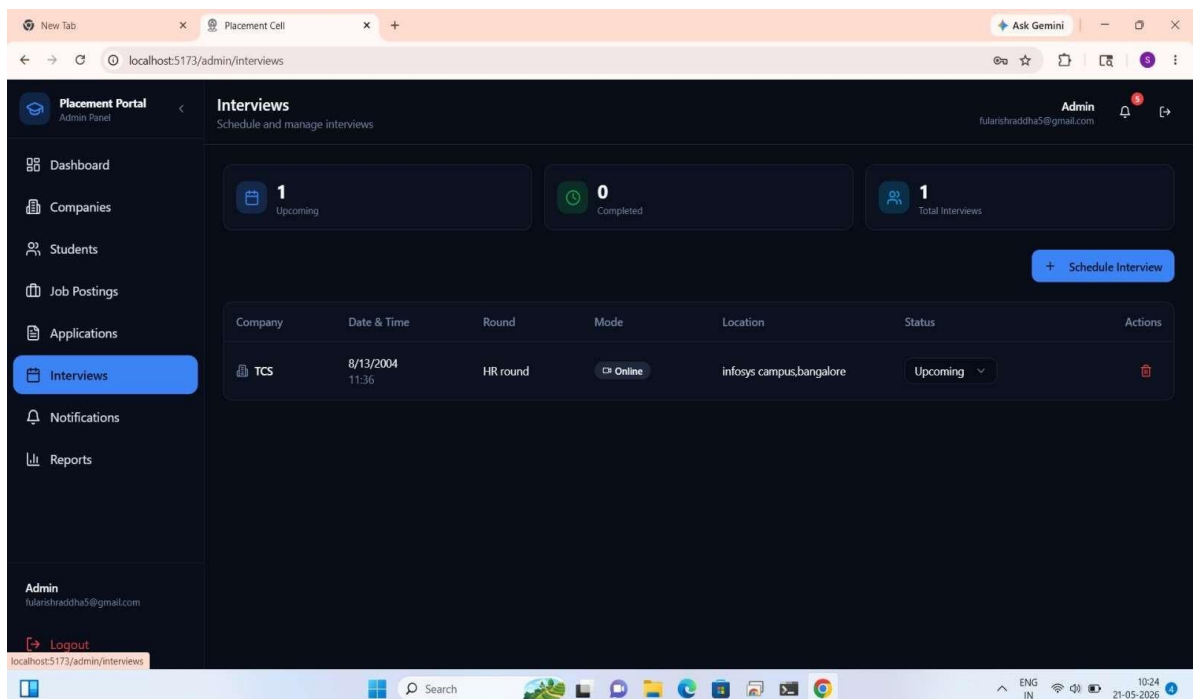


Figure 4.4: Interview Scheduling Dashboard of GenHire AI System

5.Future Scope

The proposed “GenHire AI: An Intelligent Placement and Interview Automation System” can be further enhanced by integrating advanced Artificial Intelligence technologies and modern recruitment features to improve placement support and hiring efficiency.

1. A mobile application version of the platform can be developed to provide easier accessibility for students and recruiters through smartphones and tablets.
2. The system can be expanded to include recruitment support for multiple companies, industries, and educational institutions across different regions.
3. Advanced AI features such as real-time resume analysis, automated candidate ranking, and intelligent hiring prediction can be integrated to improve recruitment accuracy.
4. The platform can be enhanced with voice-based AI interviews and facial expression analysis for more advanced candidate evaluation.
5. Machine Learning algorithms can be further improved to provide personalized job recommendations based on candidate interests, skills, and performance history.
6. A candidate profile tracking and career progress monitoring module can be implemented to help students analyze their placement preparation over time.
7. Integration with online recruitment portals, LinkedIn profiles, and company hiring systems can make the recruitment process more automated and efficient.
8. The platform can also include career guidance, certification recommendations, skill development programs, and placement analytics to support better career planning and professional growth.
9. Real-time interview feedback and communication analysis features can be added to improve candidate confidence and interview performance.
10. Future versions of the system may support multilingual interaction and chatbot-based recruitment assistance to improve accessibility for users from different backgrounds.

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