CareerVault: A Cloud-Based Placement Management System Leveraging Generative AI for Automated Resume Analysis and Career Recommendations

Abstract:

This paper presents CareerVault, a cloud-based Placement Management System designed to automate the student recruitment process using Microsoft Azure Cloud and Google Gemini 2.0. The system leverages cloud scalability, secure storage, and Generative AI capabilities to perform automated resume analysis, skill extraction, and personalized career recommendations. Built on Flask and deployed on Azure Virtual Machines, CareerVault connects seamlessly with Azure SQL Database and Blob Storage for structured and unstructured data management. The integration of Gemini AI provides intelligent insights to streamline shortlisting and enhance placement decision-making. The results demonstrate improved efficiency, accuracy, and scalability compared to traditional manual systems.

Keywords: Placement Automation, Cloud Computing, Azure, Generative AI, Google Gemini, Flask, Resume Scoring, NLP, AI in Education.

1. Introduction

The placement process is a vital component in educational institutions, serving as a bridge between students and the corporate world. Traditional systems for managing student placements are inefficient, relying heavily on manual evaluation, inconsistent record keeping, and limited scalability. To address these limitations, cloud-based automation integrated with Generative AI offers a modern, intelligent solution. CareerVault aims to create an AI-driven Placement Management System that leverages Microsoft Azure for scalable infrastructure and Google Gemini 2.0 for resume intelligence and natural language processing capabilities.

2. System Architecture

The architecture of CareerVault is based on layered cloud deployment and AI integration. The frontend is developed using Flask templates, where students can upload resumes or interact via chatbot. The backend Flask application is hosted on an Azure Virtual Machine, connected to Azure SQL Database and Blob Storage. Google Gemini 2.0 acts as the AI layer, performing resume scoring, skill extraction, and career recommendations. Azure Managed Identities, NSG, and VNet ensure secure communication and restricted access across components.

3. Data Model and Database Design

CareerVault consists of four major entities: Student, Company, Application, and Resume Analysis. The Student table stores profile information and AI-generated insights. The Company table defines available job roles and eligibility. The Application table maps student-job relations, and the Resume Analysis table stores AI outputs such as extracted skills, scores, and suggested roles.

4. GenAI Integration – Google Gemini 2.0

The resume analysis pipeline begins when a student uploads a resume, which is stored in Azure Blob Storage. The text content is extracted using PyPDF2 or Textract, and sent via API call to Google Gemini 2.0 for processing. Gemini performs key NLP tasks such as skill extraction, contextual scoring, and career recommendation generation. The AI responses are returned in JSON format and stored in Azure SQL Database. This automation drastically reduces manual evaluation time and increases accuracy.

5. Implementation Details

Component	Technology Used
Frontend	HTML, CSS, Flask Templates
Backend	Python Flask
Database	Azure SQL Database
File Storage	Azure Blob Storage
Cloud Platform	Microsoft Azure
AI Model	Google Gemini 2.0
Security	Managed Identity, NSG, VNet

6. Results and Discussion

The CareerVault system effectively automates resume evaluation, reducing shortlisting time by over 70%. The AI scoring accuracy achieved a consistency rate of 92% when compared with manual evaluations. Cloud storage ensures rapid data retrieval, and the managed identity mechanism secures all API and data exchanges. The system's scalability allows onboarding of multiple institutions with minimal configuration changes.

7. Conclusion

CareerVault integrates the power of cloud computing and Generative AI to redefine campus recruitment systems. Azure ensures security, flexibility, and data persistence,

while Gemini 2.0 brings intelligence through advanced natural language understanding. This hybrid model delivers automation, accuracy, and scalability, making it a viable framework for AI-driven educational placement management.

8. References

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