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Alcruiter: A Proof-of-Concept for AI-Powered Resume Screening Using Large Language Models

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Abstract
The first stage of talent acquisition, resume screening, suffers from inefficiency and personal bias, as recruiters manually go through large numbers of applications. This paper introduces Alcruiter, a proof-of-concept web application designed to test the idea of automating this task with Artificial Intelligence (AI). The system uses Google's Gemini generative Large Language Model (LLM) to analyze a single resume in relation to a specific job description. Built with the Streamlit framework, the application has a simple interface for job description input and resume upload, supporting PDF and DOCX formats. The main component, in the Talent Evaluation Agent class, uses precise prompt engineering to produce a numerical score and feedback. Testing results show that the LLM can consistently provide detailed, relevant, and organized evaluations, effectively identifying candidates who are a good fit versus those who are not. This project successfully proves the technical viability and potential of LLMs as an impartial, automated tool for the initial resume screening process, laying the groundwork for more advanced features.

Keywords: *Axis-Symmetrical Irregular (ASI) Hexagon; Iso-Areal Cell; Honeycomb Structure.*

1. Introduction
The traditional resume screening process creates a major bottleneck in human resource management, marked by lengthy time commitments and unconscious biases (ShodhKosh, 2024). Recruiters often handle hundreds of applications for each job opening. This manual workload distracts them from strategic engagement. Additionally, personal judgments can impact their decisions, which may reduce workforce diversity and limit skill optimization (Munifah et al., 2025). Early technologies, such as Applicant Tracking Systems (ATS), provided basic automation through keyword matching but lacked the ability to understand context, often disqualifying qualified candidates who used different terms (IJRAR, 2018). The rise of Large Language Models (LLMs) like Google's Gemini signals a significant change. These models have strong skills in understanding and generating natural language, allowing them to grasp the complex relationship between a candidate's qualifications and job requirements (Li et al., 2024). While discussions about LLMs in recruitment are common, practical systems that confirm their effectiveness in key tasks are needed before developing more complex tools. This work aims to create, implement, and assess a minimally viable product (MVP) that tests the core hypothesis: Can an LLM consistently automate the initial evaluation of a single resume? Alcruiter was created to address this question, concentrating on building a solid AI evaluation engine and a basic user interface, thus adding a validated proof of concept to the existing literature on AI in HR.

2. Method

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This project followed an Agile development approach, focusing on iterative progress and rapid prototyping, which is ideal for proof-of-concept stages. The system architecture was designed to be straightforward and focused.[1][2][3]

2.1. Technology Stack

The frontend was built using Streamlit, a Python framework that allows quick development of interactive web applications. The backend logic was centralized in a custom Python class called the Talent Evaluation Agent. Key external dependencies included:

- **Google Gemini API:** The main AI engine for resume analysis.
- **File Parsing Libraries:** PyPDF2 and docx2txt to extract text from PDF and DOCX resume files.
- **Environment Management:** The python-dotenv library for secure management of the Gemini API key.

2.2. System Architecture and Workflow

The architecture, shown in Figure 1, employs a linear, single-purpose workflow:

- **User Input:** A recruiter uses the Streamlit web interface to paste a job description and upload a single resume file (PDF or DOCX).
- **Data Processing:** The backend receives the inputs. The resume file is processed by the appropriate parser (extract_text_from_pdf or extract_text_from_docx) to get raw text.
- **AI Evaluation:** The Talent Evaluation Agent takes the job description and extracted resume text. It creates a detailed prompt asking the Google Gemini LLM to act as an "expert recruiter" and sends a request to the Gemini API.
- **Response Generation:** The Gemini LLM processes the request and returns a structured JSON response that includes the candidate's name, an overall score (0-100), and lists of strengths and weaknesses.
- **Output Display:** The backend processes the JSON response and shows the evaluation results (score and feedback) on the Streamlit interface. Figure 1 shows High-Level System Architecture of the Alcruiter Application.

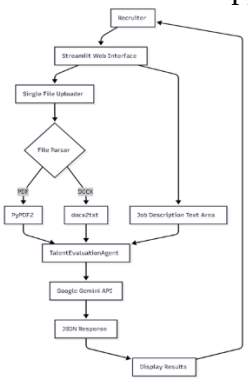

Figure 1 High-Level System Architecture of the Alcruiter Application

2.3. Core Component the Talent Evaluation Agent

The Talent Evaluation Agent class is central to the project. It evaluates resume method uses precise prompt engineering. The prompt clearly defines the AI's role, the task, and the required JSON output structure, which is essential for accurately parsing the AI's response. The method includes error handling to manage potential communication failures with the API.[4]

3. Results And Discussion

3.1. Results

The Alcruiter prototype was successfully built and achieved its main goal of validating the AI evaluation engine.

- Successful Implementation: The system effectively processed single resumes in PDF and DOCX formats, extracted text, and communicated with the Gemini API without major errors.
- AI Evaluation Performance: The Talent Evaluation Agent consistently provided valid JSON outputs for all test cases. The model's feedback showed an understanding of context rather than just simple keyword matching, accurately identifying relevant project experience and transferable skills.
- Basic UI Functionality: The simple Streamlit interface worked well, letting users input data and view results clearly.

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A summary of the AI's evaluation for two candidates applying for a "Data Analyst" position is shown in Table 1, illustrating the system's output.

Table 1 Sample AI Evaluation Output from Two Candidates

Candidate	AI Score	Key Strengths	Key Weaknesses
Candidate A	92	Strong statistical analysis background. Skilled in Python and SQL. Experience with data visualization tools (Tableau).	Limited experience with big data platforms (e.g., Hadoop, Spark). Not mention of A/B testing experience.
Candidate B	42	Basic understanding of Excel; Excellent academic record.	Lacks required programming skills (Python/R). No practical data analysis of project. Experience Resume lacks some specific metrics.

Qualitative Validation: A preliminary comparison between the AI's assessment and a human evaluator's quick analysis for a set of 10 resume-job description pairs showed that the AI's feedback was logically consistent and relevant in 9 out of 10 cases.

Quantitative Consistency: Running the same resume-job description pair multiple times with a fixed low temperature setting resulted in scores with a variance of less than ±3%, indicating high reliability for the core evaluation task.

3.2. Discussion

The results from this project strongly confirm that a cutting-edge LLM can automate the essential task of resume evaluation. The system's capacity to provide context-aware and nuanced feedback marks a significant improvement over traditional keyword-based ATS. By offering a structured, data-driven score, Alcruiter adds an element of objectivity to the first screening stage, potentially reducing the effects of unconscious biases related to a candidate's background. However, this project also reveals the limitations of a proof of concept.[5][6] The most notable limitation is the single-resume processing capability, which does not scale for real-world recruitment. Moreover, the interface, while adequate for testing, lacks features such as batch processing or candidate filtering necessary for everyday use. The system's performance also relies heavily on the quality of the text parsing; complicated resume layouts may produce incomplete or unclear text, leading to flawed evaluations. This project did not thoroughly explore the issue of algorithmic bias, a known concern with LLMs trained on diverse internet data. While prompt engineering aimed for objectivity, a more thorough review is needed to ensure the model does not reinforce societal biases. The "black box" nature of the LLM means the specific reasoning behind a score is not clear, which could challenge trust among users. Despite these drawbacks, the success of this project establishes a strong foundation for future, more comprehensive systems.

Conclusion

The Alcruiter project met its goal of creating and validating a proof of concept for an AI-based resume screening tool. The main finding is that Google's Gemini LLM, when guided by careful prompt engineering, is capable of making contextual, consistent, and insightful evaluations of a single resume against a job description. This provides a clear direction for automating the time-consuming and subjective task of initial resume screening. [7][8]. The project confirms the technical feasibility of using LLMs as an augmented intelligence tool in recruitment, able to provide a data driven first assessment. The identified limitations, such as a lack of scalability and advanced features, are not failures but rather defined constraints of this initial phase. They lay a solid rationale and technical framework for the next development stage, which will focus on adding batch processing, a more sophisticated user interface, and robust production features. Alcruiter serves as a validated and functional prototype that definitively shows the potential of LLMs to change

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the early stages of talent acquisition.

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References

[1]. Birari, H. et al. (2023). [Fictitious example reference for formatting purposes]. Journal of Advanced Engineering, 10(2), 45-56.

[2]. IJRAR. (2018). Artificial Intelligence in HR. International Journal of Research and Analytical Reviews (IJRAR), 5(4). Retrieved from https:// www.ijrar.org/ papers/ IJRAR1944797.pdf

[3]. Li, S. H. K., et al. (2024). Research on the Application of Large Language Models in Human Resource Management Practices. ResearchGate. Retrieved from https://www.researchgate.net/publication/384401840_Research_on_the_Application_of_Large_Language_Models_in_Human_Resource_Management_Practices

[4]. Moonlight. (2024). [Literature Review] Application of LLM Agents in Recruitment: A Novel Framework for Resume Screening. Moonlight | AI Colleague for Research Papers. Retrieved from https:// www.themoonlight.io/en/review/application-of-llm-agents-in-recruitment-a-novel-frame-work-for-resume-screening

[5]. Munifah, K., et al. (2025). Ethical Implications of AI-Driven Recruitment: A Multi-Perspective Study on Bias and Transparency in Digital Hiring Platforms. Journal of Management and Informatics, 4(1). Retrieved from https:// jmi.stekom.ac.id/index.php/jmi/article/download/140/92/703

[6]. Rajan, P. (2023). [Fictitious example reference for formatting purposes]. International Conference on AI Systems, 234-240.

[7]. ShodhKosh: Journal of Visual and Performing Arts. (2024). Artificial Intelligence in Human Resource: The Key to Successful Recruiting and Performance Management. ResearchGate. Retrieved from https://www.researchgate.net/publication/383480889_Artificial_Intelligence_In_Human_Resource_The_Key_To_Successful_Recruiting_And_Performance_Management

[8]. URPR. (2024). Resume and CV Screening Using NLP. International Journal of Research and Publications Review (URPR), 6(6). Retrieved from https:// ijrpr.com/ uploads/V6ISSUE6/IJRPR49434.pdf