

AI-Powered Recruitment Systems: Conversational Assessment and Predictive Shortlisting

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Abstract: *The rapid adoption of Artificial Intelligence (AI) in Human Resource Management (HRM) demands a unified, objective framework to address recruitment challenges such as human bias, lengthy cycles, and inconsistent candidate evaluation. This survey details an end-to-end AI-powered recruitment solution built upon a Django Job Portal and functioning across three stages. The pipeline begins with Automated Skill Matching using NLP and semantic models for high-accuracy initial shortlisting. Candidates exceeding the relevance threshold proceed to the core innovation: the AI-Powered Voice-Based Interview. This module utilizes a cascaded Speech-to-Text (STT), Large Language Model (LLM), and Text-to-Speech (TTS) architecture to simulate dynamic, conversational assessments that adapt questions based on the candidate's technical responses. Crucially, the system employs locally-hosted LLMs, such as Ollama, for in-house inference. This architectural choice ensures superior data privacy and security by preventing sensitive candidate data from being transferred to external cloud APIs, while simultaneously achieving greater cost-efficiency for high-volume recruitment. By integrating predictive analytics for final shortlisting, this research provides a comprehensive blueprint for building scalable, unbiased, and equitable hiring ecosystems that enhance both operational efficiency and ethical accountability.*

Keywords: AI in Recruitment, Automated Screening, Voice- Based Interview, LLM-as-an-Interviewer, Predictive Hiring, Algorithmic Bias, Natural Language Processing

