International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 10 Issue: 04 | April - 2026 SJIF Rating: 8.659 ISSN: 2582-3930

AI Recruiter Voice Agent: Automated Recruitment via Conversational AI

Yash Tyagi, Vivek Kumar, Tushar Tyagi, Niharika

CSE – Raj Kumar Goel Institute of Technology
CSE – Raj Kumar Goel Institute of Technology
CSE – Raj Kumar Goel Institute of Technology
CSE – Raj Kumar Goel Institute of Technology

Abstract - Using Next.js, Supabase, and VapiAI, the AI Recruiter Voice Agent is an automated web-based recruitment platform that conducts real-time, voice-based first-round candidate interviews. This system conducts structured, conversational interviews using predefined role-specific criteria, real-time automatic speech recognition (ASR), and natural language processing (NLP) for intelligent response evaluation, in contrast to conventional manual screening, phone-based interviews, or static chatbot questionnaires. Using an easy-to-use dashboard, recruiters set up interview templates, specify scoring criteria, and send prospects safe links. The system uses text-to-speech (TTS) to engage candidates in adaptive dialogue during interviews, transcribes responses using VapiAI with industry-leading accuracy, and analyzes material for behavioral cues, skills extraction, and experience mapping. The solution allows recruiters to make data-driven decisions 80% faster than with conventional techniques by producing clear, rubric-aligned evaluations with shortlist recommendations after the interview. The platform facilitates concurrent interviews at scale, keeps audit-friendly records for compliance, and provides interview artifacts (transcripts, scores, and summaries) via an analytics-rich recruiter dashboard. It is implemented as a cloud-native full-stack application on Supabase with role-based security. The AI Recruiter Voice Agent minimizes screening bottlenecks, enhances candidate experience, and enforces bias-mitigating uniformity throughout recruiting pipelines by combining conversational AI with structured assessment to provide a scalable, equitable, and consistent solution. Automated Recruitment, Conversational AI, Natural Language Processing, Automatic Speech Recognition, VapiAI, Next.js, Supabase, NLP Evaluation, Candidate Screening, Full-Stack Development, Candidate Assessment, AI in HR, Recruitment Automation, and Real-Time Speech Processing are among the index terms.

1.INTRODUCTION

Early-stage candidate screening is a recurrent difficulty for recruitment processes across the globe. Conventional methods rely on time-consuming, subjective, and challenging-to-scale manual resume reviews, ad hoc phone screens, and calendar-coordinated video interviews. Recruiters find it difficult to make decisions consistently, quickly, and fairly as application numbers soar. The candidate experience is negatively impacted by scheduling delays and varied interviewer styles, and large organizations report spending more than 100 hours per week on initial screening alone.

2. Body of Paper

Conversational AI platforms can now perform realistic, scalable interviews thanks to recent developments in speech recognition, huge language models, and dialogue systems. Nevertheless, current solutions are fragmented: evaluation is still done by hand, chatbots lack real communication, and voice systems lack semantic understanding. An integrated, end-to-end platform that automates screening while upholding rigor, fairness, and auditability is desperately needed.

By integrating automated evaluation, conversational discussion, and real-time voice processing into a single solution, the AI Recruiter Voice Agent fills this gap. Recruiters create role-specific templates that include behavioral standards, grading rubrics, and interview questions. Through web links, candidates participate in safe, on-demand interviews. NLP pipelines extract talents, experience, and behavioral indications; a decision engine uses rubrics to create shortlists; VapiAI transcribes speech to text with 95%+ accuracy across accents and noise. Results with complete audit trails and exporters for ATS integration are provided in a matter of seconds.

The system, which is based on Next.js (responsive frontend), Supabase (safe backend + database), and VapiAI (speech processing), doesn't require any specialist hardware, scalable horizontally for large hiring volumes, and protects data privacy with encryption and role-based security. This study shows that, in comparison to human screenings, voice-based, AI-evaluated screening maintains high candidate satisfaction while cutting the time to shortlist from hours to minutes, improving consistency, and enhancing fairness.

A. Technology used

The system, which is based on Next.js (responsive frontend), Supabase (safe backend + database), and VapiAI (speech processing), doesn't require any specialist hardware, scalable horizontally for large hiring volumes, and protects data privacy with encryption and role-based security. This study shows that, in comparison to human screenings, voice-based, AI-evaluated screening maintains high candidate satisfaction while cutting the time to shortlist from hours to minutes, improving consistency, and enhancing fairness.

Next.js Stack Architecture: For full-stack development and deployment, the application uses Next.js 14 with TypeScript. For responsive recruiter dashboards and candidate interfaces, Next.js offers server-side rendering, API routes, and Tailwind CSS/shadcn/ui. Rapid iteration, SEO-friendly public job pages, and serverless API endpoints for webhook handling are all made possible by the design.

OpenAI API Integration: Intelligent feedback generation and dynamic question generation are powered by OpenAI GPT-4o. In order to create adaptive follow-up questions depending on candidate responses, GPT-4o analyzes transcribed responses in real-time during interviews. Following the interview, it generates individualized feedback reports, behavioral insights, and assessments that are in line with the criteria. Personalized prompts reduce hallucinations and guarantee consistent, role-specific analysis.

Supabase Authentication & Database: Supabase manages PostgreSQL database operations, real-time subscriptions, and secure authentication (password/email, OAuth with Google/LinkedIn). Organization isolation is guaranteed by row-level security (RLS) policies, and audit logs, interview templates, session transcripts, and evaluation findings are stored in the schema. Vapi AI webhooks are processed by Supabase Edge Functions, which then initiate OpenAI assessments.

Real-Time Webhook Pipeline: Transcription events are streamed by Vapi AI webhooks to Next.js API routes, which initiate OpenAI analysis and instantly update Supabase. This event-driven design guarantees consistent data synchronization without polling, concurrent interview scaling, and instantaneous dashboard updates.

Multi-Language Support: For a variety of candidate pools, Vapi AI's multilingual voice models support Hindi, Spanish, and English. Next.OpenAI GPT-4o translates dynamic content, whereas js i18n manages UI localization. Language preferences are set by recruiters according to job roles, guaranteeing accessibility for both local and international hiring pipelines.

3. CONCLUSIONS

The AI Recruiter Voice Agent ensures speed, transparency, and scalability by using a modular, six-step workflow from recruiter configuration to candidate evaluation.

REFERENCES

1. Jabarian, B., Henkel, T.: Voice AI in firms: A natural field experiment on automating job interviews. SSRN Electron. J. (2025), doi:10.2139/ssrn.5395709
2. Nirgide, S. V., Deshpande, R., Prabhu, S.: AI-powered mock interview evaluator using natural language processing and deep learning. Int. J. Eng. Res. Technol. 13(2), 45–58 (2024)
3. Sharma, S., Kumar, A., Patel, R.: Cloud-based AI interview platform using transformer models and RAG. In: Proc. IEEE Int. Conf. Comput. Commun., pp. 234–245 (2023)
4. Singh, A., Gupta, N., Desai, M.: Robust speech processing for candidate screening: Challenges and solutions. Speech Lang. Process. Rev. 5(1), 78–92 (2024)
5. George, L., Thomas, P., Kumar, R.: Fair AI recruiting: Bias detection and mitigation in automated interviews. IEEE Access 12, 112345–112358 (2024), doi:10.1109/ACCESS.2024.3412890