



TalentIQ: Intelligent Candidate Evaluation and Recruitment

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Abstract. The manual procedures of screening the resumes, sifting the applicants, and reviewing the outcome of the interview process in most organizations remain a part of the recruitment processes, thus making the process to be slower, less consistent and fair. To solve these issues, this paper will offer a solution, which is TalentIQ, a smart recruitment support solution that will facilitate the initial and intermediate stages of the hiring process. The system applies the traditional software engineering and AI-based modules with the aim of identifying the structured information concerning the resumes, determine the suitability of the candidate to the job position, and facilitate the interview processes. It relies on PDF text extraction, an NLP based processing phase and a rule based ranking mechanism to generate structured candidate evaluation. Automated generation of questions and interpretation of answers to create a more homogeneous and interactive assessment space is also other AI-oriented features. The platform is implemented using MERN stack with microservices that are implemented using FastAPI in order to achieve modularity, scalability, and responsiveness. The preliminary findings of the implementation demonstrate that the processing speed, accuracy, and transparency have increased and it also helps to reduce the effort of the recruiter and enhance the hiring process.

Keywords: Recruitment Automation, Resume Parsing, Candidate Ranking, NLP, AI-Assisted Evaluation, FastAPI, Machine Learning Integration, MERN Stack, Interview Support System, Intelligent Hiring Platform.

1 Introduction

The process of recruitment is turning data-driven yet organizationally most are still relying on manual resume screening and informal assessment. This leads to a sluggish recruitment process, poor evaluation and the inability to pick the appropriate candidates with the growth in the number of applications[1]. The paper presents TalentIQ, an artificial intelligence recruitment tool that automates the process of resume parsing, skill identification, scoring and interviewing with the

help of AI. It also includes analytics dashboards, inbuilt messaging, automated testing based on NLP, and a micro services system based on the cloud. TalentIQ minimizes the amount of manual work and enhances uniformity in the evaluation of candidates. It has the capability of being modified to fit various roles. The paper describes the system architecture, major components, workflow and ways in which it can enhance the current recruitment processes[2].

2 Literature Survey

Recruitment technologies are now automated with AI and Natural Language Processing, although most systems remain under-automated, have poor extraction of skills, and lack tight coupling between hiring activities. This part examines previous studies and their shortcomings.

2.1 Existing Systems

2.1.1 Intelligent Interview Automation Systems

J. Joseph and M. V. Judy [10] introduced an interview system that enhances the evaluation of the candidates by automated questioning. Nonetheless, it does not have speech recognition and can only be used to conduct mock interviewing without the analysis of resumes and ranking of candidates.

2.1.2 Web-Based Selector–Applicant Simulation Software

Muppidi et al. [12] came up with Web-based simulation platform that measures the applicant response and communication skills, does not provide resume processing, skill identification, as well as candidate ranking.

2.1.3 Machine Learning-Based CV Matching Systems

Mohamed et al. [3] proposed ResuFit is an application that makes use of machine learning to pair job descriptions with resumes. It enhances relevancy scoring and is effective on structured resumes and does not evaluate interviews.

2.1.4 Job Recommendation Using ML and DL Models

Singh et al. [4] presented Machine learning job recommendation model enhances job matching efficiency among the candidates, yet demands vast amounts of data and extensive computing capabilities.

2.1.5 Conventional Applicant Tracking System

The initial ATSs just stored the resumes and filtered applications by keywords, without having a sense of what was relevant to determine the relevant skills[5].

2.1.6 Artificial Intelligence-based Candidate Ranking Systems

HireVue and LinkedIn Talent Insights, utilise machine learning to rank the candidates. Nonetheless, they might bring about algorithmic bias and be non-transparent in the scoring[6].

2.1.7 Skill Extraction System and Profiling Systems of Candidates

Semantic based Skill matching systems such as LinkedIn Skill Graph match skills with jobs, but find it difficult with new or domain specific skills.[7].

2.1.8 Text-to-Speech Interpretation Systems

Google Speech API, IBM Watson, and Microsoft Azure Speech to Text are speech recognition tools that support the transcription of interviews, but are problematic with accuracy because of noise, accents, and language differences[8].

2.1.9 Internet Packaged Proctoring and Behavior Surveillance

Proctor and Mettl Proctoring Suite online recruitment tools, which track candidates face-to-face and gazes, are privacy-concerning, and can also result in false positives[9].

2.2 Overview of the weaknesses of current systems

The existing recruitment mechanisms have flaws. The majority of them concentrate on screening resumes or the interview process and use structured resumes. Large datasets are also required by ML and DL models. Such problems demonstrate that a resume analysis, filtering of candidates, automatic interviews, and feedback should be included in the recruitment system.

3 Proposed Work

The suggested TalentIQ is an artificial intelligence-based recruitment system that will automate the initial hiring processes. It involves resume parsing, identification of skills, scoring of candidates and management of interviews. The NLP and structured scoring allow the system to create interview questions and score the reaction of candidates making the hiring process faster and more objective.

3.1 Analysis

The stage determines the needs of the recruiter and the candidate, the system functionality, and the technologies that facilitate the functionality.

1. User Requirements: - The system makes the processes of recruitment easier since it is possible to post the job, upload resumes and automatically extract skills, education and experience. The candidates are graded according to the suitability. AI creates interview questions and measures the answers, and security and role-based access prevents sensitive data.
2. Functional Analysis: - The system does resume parsing, NLP-based skill extraction and ranking of the candidates. It is also able to create interview questions, analyze answers, and help monitor interviews by face detection. All the data is safely stored and can be accessed by dashboards.

3. Technical Analysis: - The stack technology applied on the platform is MERN stack (MongoDB, Express.js, React.js, Node.js). There are AI services that are powered by FastAPI and spaCy. Cloudinary is used to store files, and JWT authentication and role-based access are used to provide security.

3.2 Overview of Proposed work

It is an AI-driven recruiting system that automates resume screening, ranking of candidates and interviews. NLP removes skills and creates questions and face detection oversees interviews. It is based on MERN stack, Fastapi, and cloud storage.

3.3 Use Case Diagram

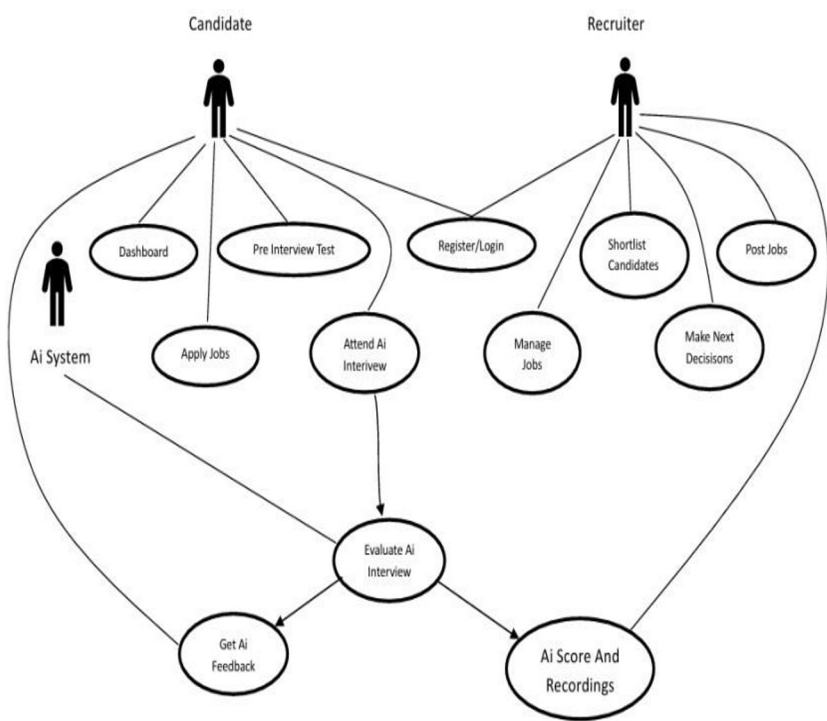


Fig. 1: Use Case Diagram

Fig 1, shows the use case diagram which is the outline of the online hiring system. These are the Candidates, Recruiters and evaluation module used case. Applicants sign up, consider vacancies, apply and get interviewed by AI. The system appraises interviews and gives responses. Advertisers post, shortlist and check score and recording of interviews.

4 System Architecture

In Fig 2, Its architecture adheres to the service-based modular system structure to allow to be scaled, be secure, and guarantee effective communication among the components.

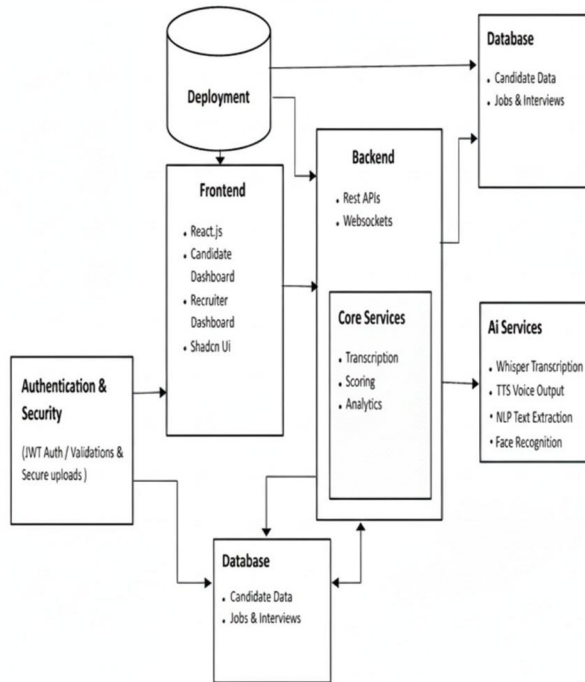


Fig. 2: System Architecture

4.1 Software Details

TalentIQ uses a layered architecture for recruitment tasks.

Frontend (Client side): -

Built with React.js, Tailwind CSS, and ShadCN UI. REST APIs handle data exchange and WebSockets enable real-time monitoring.

Backend (Server side): -

Node.js and Express.js manage APIs. JWT handles authentication and bcrypt.js encrypts passwords. AI services run through FastAPI.

Database Requirements: -

MongoDB stores users, resumes, jobs, applications, and interviews using Mon-goose collections.

5 Experiments and Results

5.1 Table for Feature-wise Experimentation

Table 1: Feature-wise Experimentation Results

Feature	Tools Used	Results
User Registration and Login	JWT, Bcrypt.js, Express.js, MongoDB	Users authenticated successfully; passwords securely hashed; unauthorized access attempts blocked.
Resume Upload & Parsing	Python FastAPI, PyMuPDF, spaCy NLP	Resumes parsed accurately; structured data such as skills and education extracted.
Skill Extraction & Normalization	spaCy, Regex, Custom Skill Mapping	Skills detected and normalized; synonyms mapped to canonical labels.
Candidate Ranking	Node.js, Ranking Algorithm, Semantic Similarity Models	Top-ranked candidates aligned with job requirements.
AI-Based Interview Question Generation	FastAPI, Transformer Models	Relevant and context-aware questions generated with minimal redundancy.
Speech-to-Text Interview Transcription	Whisper, FastAPI Microservice	Audio transcribed accurately across accents and varied conditions.
AI Answer Interpretation & Scoring	Cosine Similarity, Keyword Extraction	Scoring reflected answer relevance and completeness.
Video Proctoring	OpenCV, TensorFlow.js, Face Recognition Models	Face presence and suspicious activity detected reliably.
Job Posting & Application Management	React.js, Node.js, MongoDB	Jobs posted and applications tracked without errors.
AI Feedback Generation	NLP Summary Generator, FastAPI	Feedback generated instantly with strengths and improvement suggestions.

The design of the TalentIQ system is based on the modular design in which every component has been evaluated in terms of accuracy, efficiency and usability. The areas tested included resume parsing, skill extraction, candidate scoring, and AI interview processing and it was confirmed that the system is a good choice to be used in assisting in automated recruitment processes Fig. 3.

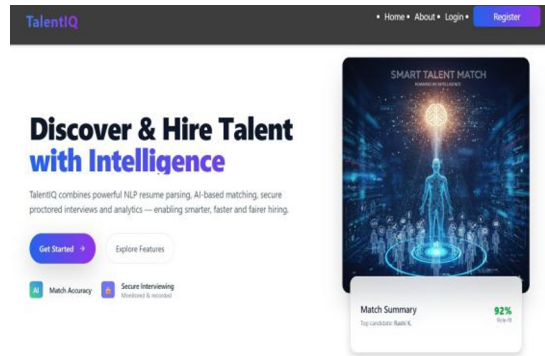


Fig. 3: Home page of the TalentIQ platform.

1. **User Registration and Login:** - The site has an easy-to-use registration and login system to recruiters and applicants. By providing simple information and choosing their role, the user is also able to securely log in or create an account, which makes it clear that the authentication system is functioning properly, as shown in Fig. 4 and Fig. 5.

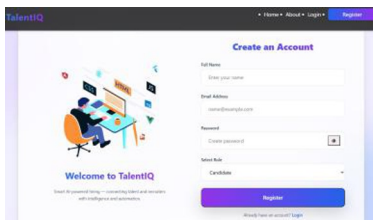


Fig. 4: Register page.

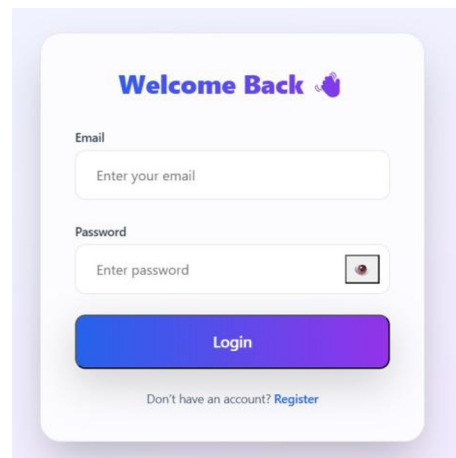


Fig. 5: Login page.

2. **Candidate Dashboard:** - The candidate dashboard shows the list of available jobs with the information about the title of work, location, salary and re-quired skills. Job browsing is easy because a search option can be used to sort jobs by title, skills or location Fig. 6.
3. **Integrated Mailbox:** - Candidates are notified via the inbox when they are shortlisted in positions. The system and the use of notifications with job titles and status updates enhance better communication between the system and candidates, as shown Fig. 7.

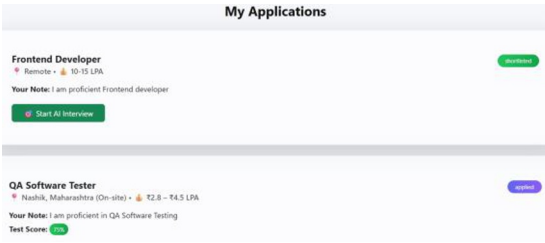


Fig. 10: Applied jobs and application tracking (My Applications).

- 6. Resume Parsing: - The resume analysis module takes the data on the submitted resumes and determines technical skills based on NLP. The results are presented both to the candidates and recruiters in an organized format.
- 7. AI-assisted Proctore Interview: - The AI interview module is used in conjunction with face detection and speech-to-text recognition to track the interview and transform spoken responses into written language to evaluate the interview appropriately and without favoritism, Fig. 11 and Fig. 12.

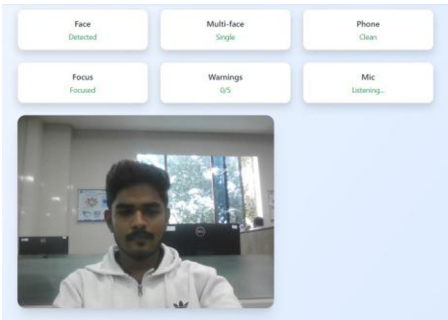


Fig. 11: AI proctored interview interface.

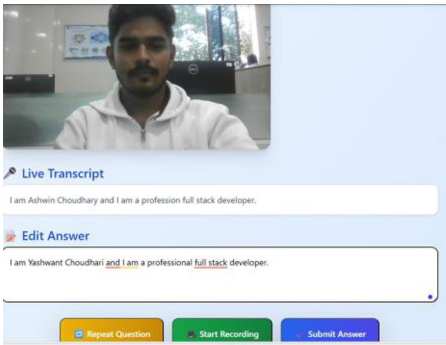


Fig. 12: Live speech-to-text transcription.

- 8. Recruiter's Dashboard: - The job creation interface enables the recruiters to make job openings easily by providing the job information through writing job titles, job descriptions and the skills required.

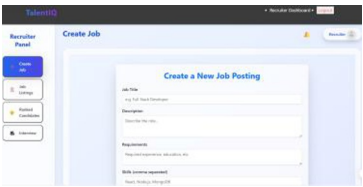


Fig. 13: Recruiter dashboard and job creation interface.

Job Listings					
Title	Location	Salary	Status	Actions	Applications
Full stack developer	pune	40k	open	View Edit Delete	View Applications
Frontend Developer	Remote	10-15 LPA	open	View Edit Delete	View Applications
Frontend Developer	Remote	10-15 LPA	open	View Edit Delete	View Applications
Java Developer	pune	4 LPA	open	View Edit Delete	View Applications
SQL Developer	Mumbai	10-15k	open	View Edit Delete	View Applications
Full Stack Developer Intern	Pune, India	₹15,000 - ₹25,000 per month	open	View Edit Delete	View Applications

Fig. 14: Recruiter job listings and management view.

9. Job Listing of Recruiter: - The job listings page assists the recruiter to maintain the job vacancies and to review the candidates in a tabular format whereby, the recruiter can edit or delete the vacancies, as shown in Fig. 14.
10. Candidate Ranking: - The AI candidate ranking system ranks the applicants according to suitability score, skill match, experience, and education, which allows making quick comparisons and data-driven decisions, as shown in Fig. 15.

Name	Email	Score	Skill Match %	Experience (yrs)	Matched Skills	Missing Skills
om_vishal	omvishal234@gmail.com	49	100%	0	JavaScript, Node.js, React	---
Rushi Chaudhari	rushi1234@gmail.com	49	66.67%	0	Node.js, React	JavaScript
georgeraff	georgeraff222@gmail.com	49	66.67%	0	Node.js, React	JavaScript

Fig. 15: AI-powered candidate ranking based on suitability score and skill match.

11. Integrated Face-to-Face Interview: - The platform also has an embedded live interview, so recruiters can conduct a video interview on the platform itself and not use other applications, enhancing the communication process and recruitment efficiency, as shown in Fig. 16.

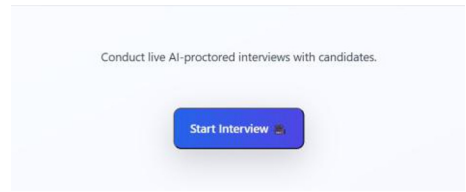


Fig. 16: Integrated face-to-face interview module for live video interviews.

6 Conclusion

TalentIQ reveals the way AI can enhance and make the process of recruitment easier. It eliminates the manual labor through automation of resume parsing, skill identification, scoring candidate ratings and interviews with AI, enhancing accuracy in the evaluation process. Such features as real-time proctoring, live transcription, and video interviews make the assessment process safe and unbiased. Altogether, the TalentIQ is a hiring solution that is scalable and efficient and allows hiring based on transparent and data-driven data.

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