WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

HireAI - Intelligent Recruitment and Resume Screening System

Tharunikaa T, Thenmozhi K, Thisanthan P, Thrishala A, Mr. M. Mithun*

Undergraduate Students, Department of Computer Science and Engineering, Sri Shakthi Institute of Engineering and Technology, Coimbatore, Tamil Nadu, India

***Project Mentor: AP/CSE,** Department of Computer Science and Engineering, Sri Shakthi Institute of Engineering and Technology, Coimbatore, Tamil Nadu, India

ABSTRACT

Recruitment teams frequently review large numbers of resumes for each vacancy. Manual screening can require repeated comparison of skills, qualifications, experience, and job-specific criteria, while information spread across separate records can make applicant tracking difficult. This paper presents HIREAI, a web-based recruitment-support system designed to organize recruitment information and provide a foundation for structured resume screening. The current prototype is developed using HTML, CSS, and JavaScript and contains interface modules for a dashboard, job management, candidate management, and resume screening. Building on this interface, the proposed workflow describes how resume text and job descriptions could be processed using Natural Language Processing (NLP), how job-related attributes could be compared, and how skill coverage and possible gaps could be presented for recruiter review. The system is designed around human oversight: automated indicators are intended to support, not replace, recruiter judgement. The present implementation demonstrates the frontend structure with sample data; live resume parsing, backend persistence, AI-based ranking, and quantitative performance evaluation are not claimed as completed results. The paper outlines the architecture, matching concept, implementation status, limitations, and responsible-development requirements for future validation.

Keywords: HIREAI, resume screening, recruitment support, Natural Language Processing, candidate–job matching, explainable AI, human-in-the-loop decision support.

1. INTRODUCTION

Recruitment involves defining a vacancy, receiving applications, examining candidate profiles, shortlisting applicants, and arranging interviews. A resume may contain education, employment history, projects, certifications, technical skills, and other details in different formats and writing styles. Recruiters must identify relevant evidence and compare it with the requirements of each role. When application volumes increase, this process can become repetitive and difficult to track consistently.

Information systems can help centralize vacancy details and candidate records. NLP techniques may also assist in processing unstructured text and identifying terms that are relevant to a job description [1]. However, a text match or numerical score is not a complete measure of a candidate's suitability. Context, transferable skills, incomplete information, and the wording used by applicants can all affect automated comparisons. Therefore, a recruitment-support tool should make the basis of its indicators reviewable and preserve human responsibility for hiring decisions.

HIREAI—Intelligent Recruitment & Resume Screening System—addresses this need through a modular web interface and a proposed AI-assisted screening workflow. The project report describes a frontend implemented with HTML, CSS, and JavaScript, using sample data to demonstrate the principal pages. This paper separates the existing interface from proposed backend and AI/NLP components so that the contribution and current implementation status are represented accurately.

2. PROBLEM STATEMENT AND OBJECTIVES

The central problem is the effort involved in organizing candidate information and comparing each application against job-specific criteria. Manual review can lead to duplicated work, inconsistent recording of evidence, and difficulty monitoring the status of applications. HIREAI is intended to provide a common interface for recruitment records and a defined pathway for future structured screening.

2.1 OBJECTIVES

Provide a unified interface for dashboard monitoring, job management, candidate management, and resume screening.

Define a workflow for extracting relevant information from resumes and job descriptions.

Compare candidate attributes with role requirements using job-related skills, qualifications, and experience.

Present matching indicators and potential skill gaps in a form that recruiters can inspect.

Provide future extension points for interview-question suggestions and resume-improvement guidance.

Keep final shortlisting and hiring decisions under human supervision and encourage responsible handling of candidate data.

3. RELATED CONCEPTS

3.1 Resume Screening and Text Processing

Resume screening requires extracting useful information from documents that may differ in structure, terminology, and formatting. Information retrieval and language-processing methods provide established concepts for representing text, identifying terms, and comparing documents [1, 2]. In a practical deployment, extraction quality must be checked because tables, columns, abbreviations, scanned pages, and unusual layouts may cause information to be missed or misread.

3.2 Candidate–Job Alignment

Candidate–job alignment is the comparison of evidence in an application with requirements stated for a particular vacancy. A transparent baseline can begin with required skills and qualifications, then show which requirements appear to be supported by the resume. More advanced semantic methods may recognize related expressions, but their output should still be traceable to resume evidence and job criteria. HIREAI describes this as a proposed processing stage; its current sample-data interface is not evidence of a validated matching model.

3.3 Human Oversight and Risk Management

AI-supported recruitment has potential risks, including unfair outcomes, over-reliance on automated scores, privacy exposure, and errors caused by incomplete or ambiguous data. Risk-management guidance emphasizes identifying, assessing, and monitoring risks throughout an AI system's lifecycle [3, 4]. For HIREAI, this means using role-relevant criteria, explaining why an indicator was produced where possible, testing across varied resumes, limiting access to candidate information, and ensuring that a recruiter reviews the evidence before making decisions.

4. PROPOSED SYSTEM AND METHODOLOGY

HIREAI is organized as a modular recruitment-support application. The frontend provides the navigation and presentation layer. A future full implementation can connect the interface to a backend service, a persistent database, and a resume-processing component. The proposed workflow is described below as a design for further development, not as a claim that every stage is currently operational.

4.1 Functional Modules

Module	Purpose	Current status
Dashboard	Provides an overview of recruitment information and navigation to major sections.	Frontend page demonstrated with sample data.
Job management	Represents vacancies and their descriptions, required skills, and qualifications.	Interface module included in the prototype.
Candidate management	Organizes applicant details for recruiter review.	Interface module included in the prototype.
Resume screening	Provides a place to review candidate information against job requirements.	Screening interface exists; automated parsing and ranking are proposed extensions.
AI/NLP processing	Extracts resume attributes and compares them with vacancy criteria.	Proposed; not validated as a working AI component in the supplied report.
Interview and resume guidance	Suggests interview questions and possible resume improvements.	Future enhancement.

4.2 Proposed Screening Workflow

Job definition: the recruiter enters or selects a vacancy and its required skills, qualifications, and experience criteria.

Resume submission: a candidate resume is supplied in a supported file format after appropriate authorization.

Text extraction: a processing service extracts readable text and flags documents that cannot be processed reliably.

Attribute identification: the proposed NLP component identifies potential skills, qualifications, experience, and related evidence.

Comparison: extracted attributes are compared with the explicit requirements of the selected vacancy.

Result presentation: the interface displays matched requirements, missing or unclear evidence, and any proposed matching indicator.

Recruiter review: the recruiter checks the original resume and contextual evidence before deciding whether to shortlist or proceed.

4.3 Candidate–Job Matching Concept

For an initial, interpretable baseline, the required skills for a role can be represented as a finite set. The number of requirements for which supporting evidence is detected in a resume can be divided by the total number of required skills. The resulting value is a skill-coverage indicator, not a probability of hiring success.

Skill Coverage (%) = (Required skills with detected evidence ÷ Total required skills) × 100

This formula is a proposed baseline and is not reported as an implemented or experimentally evaluated feature. It may over-simplify requirements, treat all skills as equally important, or miss equivalent terminology. If extended, the system should show the evidence behind each matched requirement, distinguish "not found" from "not provided," and validate any weights against representative data. A score should never be interpreted as a complete measure of ability or used as the sole basis for rejection.

4.4 Proposed System Architecture

The following logical architecture shows the relationship between the demonstrated frontend and the components proposed for future integration.

RECRUITER / AUTHORIZED USER
↓
WEB INTERFACE — Dashboard | Jobs | Candidates | Screening [Current prototype: HTML, CSS, JavaScript]
↓
BACKEND API + AUTHENTICATION + VALIDATION [Proposed]
↓
DATABASE FOR JOBS, CANDIDATES, AND SCREENING RECORDS [Proposed]
↓
RESUME TEXT EXTRACTION → NLP ATTRIBUTE IDENTIFICATION → JOB-CRITERIA COMPARISON [Proposed]
↓
REVIEWABLE MATCH INDICATORS / SKILL-GAP EVIDENCE → HUMAN RECRUITER REVIEW

Figure 1. Proposed HIREAI architecture. The interface layer is represented in the current prototype; backend, database, and automated NLP stages require implementation and testing unless separately demonstrated.

5. IMPLEMENTATION AND TECHNOLOGY

The supplied project report identifies HTML, CSS, and JavaScript as the technologies used for the frontend. HTML defines page structure, CSS controls layout and visual presentation, and JavaScript supports client-side interactions and the display of sample recruitment data. The principal interface areas are dashboard monitoring, job management, candidate management, and resume screening. These pages establish the navigation and presentation foundation for later integration.

A complete deployment would require additional services. A backend API could validate requests and coordinate processing; a database could persist vacancies and candidate records; and a resume-processing service could extract text and produce structured attributes. The supplied report describes these as components for integration rather than evidence of an already completed, tested backend. Before real candidate data is used, the system should also implement authentication, role-based permissions, secure upload and storage, input validation, logging controls, and a defined data-retention policy.

6. RESULTS AND DISCUSSION

The result supported by the supplied project report is a frontend prototype that organizes recruitment-related information into dashboard, job-management, candidate-management, and screening pages. Sample data is used to demonstrate the interface. This provides a visible structure for navigating recruitment information and a location in which future screening indicators could be displayed.

The project report does not provide a measured evaluation of live resume parsing, NLP extraction quality, candidate-ranking accuracy, recruiter time saved, or fairness outcomes. Consequently, no numerical performance results are claimed in this paper. The proposed screening workflow describes a development direction; it should not be confused with a completed experimental evaluation.

6.1 Recommended Evaluation Plan

After backend and AI/NLP integration, evaluation should be conducted on a documented set of consented or appropriately anonymized resumes and job descriptions. The evaluation plan should report the dataset composition, inclusion criteria, resume formats, ground-truth annotation procedure, and limitations. Suitable measures may include precision, recall, and F1-score for skill extraction; agreement between system indicators and expert-reviewed evidence; processing failure rate across document formats; and usability feedback from recruiters. Fairness checks should examine whether error rates differ across relevant groups where lawful, ethical, and adequately supported data is available. A pilot should also test access control, file security, data deletion, and auditability before operational use.

7. RESPONSIBLE USE AND PRIVACY

Candidate resumes contain personal information and may include details unrelated to job performance. A responsible implementation should collect only information needed for recruitment, restrict access by role, protect files in transit and at rest, and define how long records are retained. It should avoid inferring sensitive personal attributes and should not use proxies unrelated to the job. Candidates should not be rejected solely because an automated system fails to detect a skill or cannot parse a resume. Recruiters must be able to inspect source evidence, correct extraction errors, and override recommendations. These controls align with the general risk-management principles described in AI risk guidance [3, 4].

8. LIMITATIONS AND FUTURE ENHANCEMENTS

The current implementation is limited to the frontend and sample-data presentation described in the project report. A fully integrated backend, persistent database, real resume-text extraction, automated NLP-based matching, and validated performance measurements are not demonstrated in the available materials. The paper therefore does not claim proven accuracy, bias reduction, or recruitment-time savings.

Future work includes implementing secure resume upload and text extraction; integrating skill and qualification identification; developing transparent candidate–job comparison; adding persistent job and candidate records; and building optional interview-question and resume-improvement suggestions. Further work should test varied resume layouts, missing and ambiguous information, explainability, privacy and security, recruiter usability, and possible disparate error patterns. Any deployed ranking should remain advisory and subject to meaningful human review.

9. CONCLUSION

HIREAI presents a structured web-based approach to recruitment support by bringing dashboard monitoring, job information, candidate records, and resume screening into one interface. The current HTML, CSS, and JavaScript prototype establishes the frontend foundation. The proposed architecture describes how text extraction, NLP-based attribute identification, candidate–job comparison, and reviewable skill-gap indicators could be added in later development. The paper's main contribution is a clearly separated, human-in-the-loop workflow that links recruitment information management with a potential AI-assisted screening process while acknowledging implementation limits. Future development must combine technical validation with privacy protection, transparent criteria, fairness assessment, and recruiter oversight before the system can be evaluated for real-world effectiveness.

WORKFLOW OF THE PROPOSED HIREAI SYSTEM

The proposed HireAI workflow organizes recruitment into a sequence of recruiter-led steps. The current prototype provides the user-interface structure for recruitment dashboards, job management, candidate management, and screening views. Automated parsing, semantic matching, ranking, and AI-generated interview questions are intended processing stages and should be described as implemented only after they are integrated and tested.



Figure 1. Workflow of the proposed HireAI recruitment screening process.

Workflow Description

1. Recruiter access: The recruiter opens the dashboard to view the available job and candidate-management options.

2. Job requirement setup: The recruiter selects a job role and checks the required skills, qualifications, and experience.

3. Resume input: Candidate resumes are uploaded or selected for screening against the chosen role.

4. Resume processing (planned AI stage): A resume parser can extract structured information such as skills, education, and experience.

5. Candidate–job alignment (planned AI stage): The extracted candidate profile is compared with the job requirements to identify relevant and missing skills.

6. Match assessment (planned AI stage): A matching component can calculate a score and provide a ranked list for recruiter review. Scores should be validated before operational use.

7. Human review: The recruiter examines the candidate profile and supporting evidence, then makes the final decision. The system should support rather than replace human judgement.

8. Interview support (planned AI stage): After integration, the system may suggest interview questions and resume-improvement feedback based on the job and candidate profile.

9. Status update: The recruiter updates the candidate or job status and records the outcome.

Note: The flowchart distinguishes the current interface-level prototype from AI/NLP stages proposed for integration. Before journal submission, update this description to reflect the exact features that have been implemented and tested.

REFERENCES

[1] D. Jurafsky and J. H. Martin, Speech and Language Processing, 3rd ed. draft. Online textbook, 2023. Available: https://web.stanford.edu/~jurafsky/slp3/ (accessed 29 October 2026).

[2] C. D. Manning, P. Raghavan, and H. Schütze, Introduction to Information Retrieval. Cambridge, UK: Cambridge University Press, 2008. Available: https://nlp.stanford.edu/IR-book/ .

[3] National Institute of Standards and Technology, Artificial Intelligence Risk Management Framework (AI RMF 1.0), NIST AI 100-1, Jan. 2023. doi: 10.6028/NIST.AI.100-1.

[4] International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 23894:2023, Information technology—Artificial intelligence—Guidance on risk management, 2023.

[5] HIREAI Project Team, HIREAI—Intelligent Recruitment & Resume Screening System: Project Report. Department of Computer Science and Engineering, Sri Shakthi Institute of Engineering and Technology, Coimbatore, 2026.