

AI-Powered Resume Screening Tool

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1. Preface

1.1 Document Purpose

The purpose of this document is to provide a detailed specification for the development of an AI-powered resume screening tool. It outlines the system's functionality, architecture, and user requirements to guide the development team in building a solution that efficiently assists HR managers in filtering and ranking resumes based on job descriptions using NLP technologies.

1.2 Target Users

The primary users of this system include:

- **HR Managers:** Users responsible for uploading resumes, inputting job descriptions, and reviewing ranked candidates.
- **Recruiters:** Personnel who manage large volumes of candidates and rely on automated tools to streamline their hiring processes.
- **System Administrators:** Individuals responsible for maintaining the system, ensuring it runs smoothly, and handling user accounts and data management tasks.

1.3 Revision History

Version	Author	Description	Date
0.1	Rawan	Initial	20-10-2024

2. Introduction

2.1 Purpose

The AI-powered resume screening tool is designed to automate and optimize the process of filtering and ranking resumes against specific job descriptions. By leveraging advanced Natural Language Processing (NLP) models, the system will help HR managers efficiently manage large volumes of resumes, reduce the time spent manually reviewing applications, and identify the most relevant candidates quickly.

2.2 Scope

This system will allow HR personnel to:

- Upload resumes in common formats (PDF, DOCX).
- Input or select job descriptions for matching.
- Automatically analyze and rank resumes based on how closely they match the job description.
- Display the ranked results in a user-friendly dashboard. The system is built using Python (Flask/Django), MySQL for database management, and React for the frontend interface. It will also integrate machine learning models, like BERT, for context and keyword-based resume analysis.

2.3 Overview

The AI-powered resume screening tool consists of:

- A backend that manages data processing, resume analysis, and job description matching.
- A frontend interface where HR managers can upload resumes, input job descriptions, and view ranked candidates.
- A database to store resumes, job descriptions, and analysis results. The system is designed to handle multiple resumes and job descriptions concurrently, providing HR personnel with the ability to quickly identify top candidates and improve their recruitment workflow.

3. Glossary

3.1 Acronyms, definitions and abbreviations

- **NLP:** Natural Language Processing
- **HR:** Human Resources
- **API:** Application Programming Interface
- **CRUD:** Create, Read, Update, Delete
- **BERT:** Bidirectional Encoder Representations from Transformers
- **UI:** User Interface
- **GDPR:** General Data Protection Regulation

4. System Users

4.1 System stakeholders

- **System Engineer**
 - Responsible for requirements gathering
 - Responsible for development
 - Responsible for deployment and support
- **HR Manager**
 - The primary user of the tool
 - Upload resumes and job descriptions
 - Review ranked candidates
 - Provide feedback on system performance
- **Recruiter**
 - Manage candidate sourcing
 - Filter and rank resumes based on specific criteria
 - Facilitate communication with shortlisted candidates
- **System Administrator**
 - Manage user accounts and permissions
 - Ensure system security and data protection
 - Monitor system performance and troubleshoot issues

4.2 Users objectives

- **System Engineer**

- Gain experience in software engineering and development
- Implement best practices in software design and architecture
- Collaborate effectively with other stakeholders

- **HR Manager**

- Streamline the resume screening process
- Identify top candidates quickly and efficiently
- Improve overall recruitment workflow

- **Recruiter**

- Efficiently manage a high volume of applications
- Ensure a diverse candidate pool
- Provide timely updates and feedback to candidates

- **System Administrator**

- Maintain system stability and performance
- Ensure user data is secure and compliant with regulations
- Facilitate smooth operation and user satisfaction

5. User Requirements definitions

5.1 System Functions

- 1. Upload Resumes**
- 2. Input Job Descriptions**
- 3. Analyze Resumes**
- 4. Rank Resumes**
- 5. Display Ranked Candidates**
- 6. Provide Feedback on Rankings**
- 7. Manage User Accounts**
- 8. Generate Recruitment Reports**
- 9. Search for Candidates**
- 10. Filter Candidates**
- 11. View Candidate Details**
- 12. Track User Activities**

5.2 Constraints

1. Supported File Formats

- The system must only accept resumes in PDF and DOCX formats during the initial deployment.

2. Language Support

- The system shall only process resumes and job descriptions written in English in the initial version.

3. Resume Processing Limit

- The system must handle a maximum of 100 resumes for analysis at one time.

4. Data Privacy Compliance

- Ensure compliance with data protection regulations (e.g., GDPR) to secure candidate information.

5. Performance Requirements

- The system must return ranked results within 5 seconds for up to 100 resumes to maintain a responsive experience.

6. System Architecture

7. System Functional requirements

7.1 Resume Management

1. Resume Upload

- The system shall allow HR personnel to upload resumes in PDF and DOCX formats.
- The system shall provide a drag-and-drop interface for easy file uploads.

2. Resume Parsing

- The system shall automatically extract key information from uploaded resumes, such as name, contact information, work experience, education, and skills.

3. Resume Storage

- The system shall store parsed resumes in a database for future reference and analysis.

4. Bulk Resume Upload

- The system shall allow users to upload multiple resumes at once, processing them concurrently for analysis.

7.2 Job Description Management

1. Job Description Input

- The system shall enable HR personnel to input job descriptions manually or select from previously saved descriptions.

2. Job Description Storage

- The system shall store job descriptions in the database for future analysis and use.

3. Edit and Delete Job Descriptions

- The system shall allow HR personnel to edit and delete existing job descriptions as necessary.

7.3 Resume Analysis and Ranking

1. Resume-Job Description Matching

- The system shall use an NLP model (e.g., BERT) to analyze resumes and compare them with the job description.

2. Candidate Ranking

- The system shall generate a ranked list of candidates based on how closely their resumes match the job description.

3. Filtering and Sorting

- The system shall allow users to filter candidates by criteria such as skills, years of experience, education, and more.
- The system shall allow users to sort ranked candidates by relevance score or other attributes.

4. Resume Review

- The system shall provide a detailed view of each candidate's resume alongside the relevance score.

7.4 Reporting and Analytics

1. Candidate Reports

- The system shall generate reports on candidates based on the analysis, including detailed insights on why certain candidates were ranked higher than others.

2. Recruitment Metrics

- The system shall generate reports on key recruitment metrics, such as the number of resumes processed, time spent on candidate reviews, and the number of shortlisted candidates.

3. Export Reports

- The system shall allow users to export reports in PDF or CSV formats for offline use.

7.5 User Management

1. User Authentication

- The system shall require users to authenticate via secure login using a username and password.

2. Role-Based Access Control

- The system shall implement role-based access control, with different permissions for HR personnel, recruiters, and administrators.

3. User Account Management

- The system shall allow administrators to create, edit, and delete user accounts, specifying roles and access levels.

7.6 Feedback and Continuous Improvement

1. Feedback Collection

- The system shall provide a mechanism for HR personnel to give feedback on the accuracy and usefulness of the rankings.

2. Model Improvement

- The system shall use feedback to improve the performance and accuracy of the NLP model over time, enabling continuous learning.

7.7 Notification System

1. Job Alerts

- The system shall notify users when new job descriptions are added or when resumes are successfully processed and ranked.

2. Status Updates

- The system shall notify candidates of their application status (e.g., shortlisted or not) via email, where applicable.

7.8 Security and Compliance

1. Data Encryption

- The system shall encrypt all sensitive data, including resumes and user information, both in transit and at rest.

2. GDPR Compliance

- The system shall comply with GDPR regulations by providing candidates with the option to request data removal and ensuring secure handling of personal information.

8. Interface Requirements

9. Non-functional Requirements

9.1 Availability

- The system should be available and operational during the organization's working hours.
- Downtime outside working hours for maintenance or updates shall be scheduled with prior notice to users.

9.2 Security

- Access to the system is restricted to internal users within the organization (e.g., HR personnel, administrators) and shall not be accessible from external networks or locations.

9.3 Safety

- All physical servers hosting the system will be securely stored in a designated server room within the organization's premises (e.g., in IT department).
- Physical access to the servers will be restricted to authorized personnel only.

9.4 Data Privacy

- Personal data, including resumes and candidate information, shall be protected in compliance with relevant data privacy laws (e.g., GDPR).

- All user interactions with the system shall be logged to track access and modifications to sensitive data.

9.5 Data Backup

- The system shall perform regular daily backups of all critical data (e.g., resumes, job descriptions, user data) to ensure data recovery in case of an unexpected failure.

10. System Models and Diagrams

11. System Evolution

- The system should be compatible with and function seamlessly on various operating systems, including Windows, Linux, and macOS.
- It should be optimized to work effectively on devices with lower specifications, ensuring that only the server hosting the system requires high-performance capabilities.
- The design and layout of the generated certificates, reports, and other documents should be flexible and adaptable to changes, allowing easy updates to meet evolving organizational or regulatory requirements.

12. Time Plan

13. Appendices

14. References