

SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT

for

MatchMyResume

Version 1.0

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1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document provides a comprehensive description of the Resume-Job Description Matching System. The document specifies the functional and non-functional requirements for the system, which aims to automate the resume screening process by analyzing the compatibility between candidate resumes and job descriptions. This SRS is intended to serve as the primary reference for development, testing, and project management teams throughout the software development lifecycle.

The system addresses the challenge of manual resume screening by providing an automated, objective scoring mechanism that evaluates candidate-job fit based on textual analysis and keyword matching algorithms.

1.2 Intended Audience and Reading Suggestions

This document is intended for the following audiences:

Developers and Engineers: Should focus on Sections 3 (Specific Requirements) and 4 (System Features) for detailed technical specifications and implementation guidelines.

Project Managers: Should review Sections 1 (Introduction) and 2 (Overall Description) to understand project scope, constraints, and high-level requirements.

Quality Assurance Teams: Should concentrate on Section 3.3 (Performance Requirements) and 3.4 (Quality Attributes) to develop comprehensive test plans.

Stakeholders and Business Analysts: Should read Sections 1.3 (Project Scope) and 2.1 (Product Perspective) to understand business value and system capabilities.

Designers and UX Teams: Should review Section 2.2 (User Classes and Characteristics) and 3.1 (External Interface Requirements) for user experience considerations.

It is recommended that all readers begin with Section 1 to gain context before proceeding to sections relevant to their role.

1.3 Project Scope

The Resume-Job Description Matching System is a dual-interface web application designed to streamline the recruitment process through automated resume analysis and ranking. The system serves two primary user groups: job candidates and employers (recruiters).

For Candidates: The system provides an intelligent self-assessment tool that enables job seekers to evaluate how well their resume aligns with specific job descriptions. Candidates can upload their resume and input a target job description to receive an objective compatibility score (0-100 scale) along with analytical feedback. This empowers candidates to optimize their resumes before applying to positions.

For Employers: The system offers a comprehensive candidate screening solution that automates the initial resume review process. Recruiters can upload a single job description along with multiple candidate resumes to receive a ranked list of candidates based on their match scores. This significantly reduces time-to-hire and ensures consistent, unbiased initial screening.

Key Objectives:

- Automate resume screening to reduce manual review time by up to 80%

- Provide objective, data-driven candidate rankings based on quantifiable metrics
- Enable candidates to improve their application materials through self-assessment
- Support multiple file formats (PDF, DOCX) for maximum accessibility
- Deliver real-time analysis results with intuitive visualization

System Boundaries: The system focuses exclusively on textual analysis and keyword matching. It does not include features such as applicant tracking, interview scheduling, candidate communication, background verification, or integration with external HR management systems. The system does not store candidate personal information beyond the current session.

Expected Benefits:

- Reduced recruitment cycle time
- Improved candidate-job fit through objective matching
- Enhanced candidate experience through transparency
- Standardized screening process across all applications
- Cost savings through automation of repetitive tasks

1.4 Definitions

Resume: A formal document submitted by a job candidate that details their educational background, work experience, skills, certifications, and qualifications relevant to employment opportunities.

Job Description (JD): A comprehensive document created by an employer that outlines the responsibilities, required qualifications, desired skills, experience level, and expectations for a specific position within an organization.

Match Score: A numerical value ranging from 0 to 100 that quantifies the degree of compatibility between a candidate's resume and a specific job description. Higher scores indicate stronger alignment. The score is calculated using textual similarity algorithms and keyword matching techniques.

Candidate: An individual job seeker who uses the system to evaluate their resume against job descriptions for self-assessment and resume optimization purposes.

Employer/Recruiter: An individual or organization representative who uses the system to screen multiple candidate resumes against a job description and obtain ranked results.

Text Extraction: The automated process of converting content from uploaded document files (PDF or DOCX format) into machine-readable plain text for subsequent analysis.

Keyword Matching: An analytical technique that identifies and compares significant terms, phrases, and concepts present in both the resume and job description to assess relevance and compatibility.

Cosine Similarity: A mathematical measure used to calculate the similarity between two text documents by representing them as vectors and computing the cosine of the angle between these vectors. Values range from 0 (completely dissimilar) to 1 (identical).

Ranked List: An ordered presentation of candidate resumes sorted in descending order by their match scores, with the highest-scoring candidates appearing first.

Session: A temporary period of user interaction with the system during which uploaded files and analysis results are maintained in memory. All data is cleared when the session ends or when the user resets the interface.

1.5 Abbreviations

SRS: Software Requirements Specification – A comprehensive document that describes the functional and non-functional requirements of a software system.

UI: User Interface – The visual and interactive elements through which users interact with the system.

JD: Job Description – A document describing the requirements and responsibilities of a position.

PDF: Portable Document Format – A file format developed by Adobe for presenting documents independent of software, hardware, or operating system.

DOCX: Microsoft Word Open XML Document – The default file format for Microsoft Word documents from 2007 onwards.

API: Application Programming Interface – A set of protocols and tools for building software applications and enabling communication between different software components.

ML: Machine Learning – A subset of artificial intelligence that enables systems to learn and improve from experience without being explicitly programmed.

NLP: Natural Language Processing – A field of artificial intelligence focused on enabling computers to understand, interpret, and generate human language.

QA: Quality Assurance – The systematic process of ensuring that a product meets specified requirements and quality standards.

REST: Representational State Transfer – An architectural style for designing networked applications using stateless communication protocols.

JSON: JavaScript Object Notation – A lightweight data interchange format that is easy for humans to read and write and easy for machines to parse and generate.

HTTP: HyperText Transfer Protocol – The foundation of data communication for the World Wide Web.

HTTPS: HyperText Transfer Protocol Secure – An extension of HTTP with security features for encrypted communication.

CRUD: Create, Read, Update, Delete – The four basic operations of persistent storage.

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1.7 Overview

The remainder of this document is organized into four main sections that provide progressively detailed information about the Resume-Job Description Matching System.

Section 2 – Overall Description: This section provides a high-level overview of the system, describing its context within the recruitment ecosystem and its relationship with users. It defines the characteristics of different user classes (candidates, employers, and administrators), outlines general constraints that influence system design, and identifies key assumptions and dependencies. This section establishes the foundation for understanding system capabilities and limitations.

Section 3 – Specific Requirements: This section details the functional requirements that define what the system must do. It describes external interfaces (user interfaces, hardware interfaces, software interfaces), specifies detailed functional requirements for each user class, establishes performance benchmarks, defines quality attributes such as reliability and usability, and identifies any additional requirements not covered in other sections.

Section 4 – System Features: This section organizes requirements by system features, describing each feature's priority, purpose, and associated functional requirements. It provides information about the system architecture, technology stack, and planned feature enhancements. This section serves as a roadmap for development prioritization.

Section 5 – Change History: This section documents all modifications made to the SRS document over time, including version numbers, dates, authors, and descriptions of changes. This ensures traceability and maintains a clear record of requirements evolution.

2. Overall Description

2.1 Product Perspective

The Resume-Job Description Matching System is a new, self-contained web-based application designed to operate independently without integration requirements with existing HR management systems or applicant tracking systems. The system exists within the broader recruitment technology ecosystem but functions as a standalone tool accessible via standard web browsers.

System Context: The system serves as an intermediary analytical tool in the recruitment process, positioned between resume creation and formal application submission (for candidates) or between resume receipt and detailed manual review (for employers). It does not replace comprehensive applicant tracking systems but rather complements them by providing specialized matching and ranking capabilities.

System Interfaces: The application consists of a web-based frontend accessible through modern browsers and a backend processing system that handles file parsing and analysis. The system operates entirely through HTTP/HTTPS protocols and does not require installation of client-side software beyond a web browser. It does not interface with external databases, third-party APIs, or enterprise systems. All data exists only in temporary session memory during active use, with no persistent storage beyond the session lifecycle.

User Interfaces: The system provides two distinct user interfaces: a candidate interface for individual resume analysis and an employer interface for bulk resume screening. Both interfaces are designed with responsive layouts to ensure usability across desktop, tablet, and mobile devices.

Hardware Interfaces: The system requires standard computing hardware capable of running modern web browsers. No specialized hardware components are necessary. Server-side infrastructure must support file upload capabilities and CPU resources sufficient for text processing and similarity calculations.

Software Interfaces: The system utilizes document parsing libraries (PDF and DOCX processors) for text extraction, natural language processing libraries for keyword extraction and text analysis, and standard web technologies for frontend delivery. No external software dependencies requiring licensing or integration are involved.

Communications Interfaces: All communication occurs via standard HTTP/HTTPS protocols. File uploads are handled through multipart form data transmission. Analysis results are returned as JSON-formatted responses for rendering in the user interface.

Memory and Storage: The system maintains temporary storage only during active user sessions. Resume files and extracted text exist solely in memory or temporary directories during processing. For employer ranking, only resume names and match scores are cached in session memory for display purposes—no parsed resume text or personal content is persisted. All temporary data is cleared automatically upon session termination, user-initiated reset, or after 24 hours of inactivity, whichever occurs first.

Operations: Normal operation involves user-initiated file uploads, automated background processing for text extraction and analysis, and real-time presentation of results. The system operates in a stateless manner, with each analysis session independent of previous interactions.

2.2 User Classes and Characteristics

The system is designed to serve three distinct user classes, each with unique needs, technical capabilities, and usage patterns. Understanding these user classes is essential for ensuring the system meets diverse requirements while maintaining usability and effectiveness.

2.2.1 Candidate Attributes and Operations

User Profile: Candidates are individual job seekers ranging from recent graduates to experienced professionals seeking employment opportunities. They may have varying levels of technical proficiency and familiarity with digital tools. This user class represents the largest and most diverse group of system users.

Technical Expertise: Candidates are assumed to have basic computer literacy, including the ability to navigate websites, upload files, and interpret numerical scores. No specialized technical knowledge is required. The interface must accommodate users with minimal technical experience while remaining efficient for tech-savvy users.

Usage Frequency: Candidates typically use the system episodically during active job search periods. A single candidate may perform multiple analyses as they refine their resume or evaluate different job opportunities. Usage patterns are likely to spike during peak hiring seasons.

Primary Objectives:

- Evaluate resume compatibility with specific job descriptions before applying
- Identify gaps or weaknesses in their resume relative to target positions
- Optimize resume content to improve match scores
- Gain confidence in application competitiveness

Key Operations:

- Upload personal resume in PDF or DOCX format
- Input or paste target job description text
- View match score and analysis summary
- Reset interface to analyze against different job descriptions
- Download or save analysis results (future enhancement)

Access Privileges: Candidates have access only to their own uploaded documents and analysis results. They cannot view other candidates' resumes, scores, or employer-side functionality.

Security and Privacy Needs: Candidates expect their resume content to remain confidential and not be stored permanently. They require assurance that their personal information will not be shared, sold, or used for purposes beyond the immediate analysis.

Success Criteria: Candidates consider the system successful if it provides actionable insights that help them improve their resumes and increase their chances of being selected for interviews.

2.2.2 Employer Attributes

User Profile: Employers and recruiters are HR professionals, hiring managers, or small business owners responsible for evaluating job applicants and making hiring decisions. They typically handle multiple open positions simultaneously and process large volumes of resumes.

Technical Expertise: Employers are expected to have moderate technical proficiency, including experience with web-based tools, file management, and data interpretation. Many recruiters use applicant tracking systems and other HR technologies regularly, making them comfortable with digital recruitment tools.

Usage Frequency: Employers use the system regularly throughout active hiring cycles. A single employer may analyze dozens or hundreds of resumes across multiple positions. Usage is typically concentrated during business hours and may occur in batches.

Primary Objectives:

- Efficiently screen large numbers of candidate resumes
- Identify top candidates based on objective compatibility metrics
- Reduce time spent on initial resume review
- Make data-driven shortlisting decisions
- Maintain consistency in candidate evaluation

Key Operations:

- Upload or input job description for an open position
- Upload multiple candidate resumes simultaneously (batch upload)
- Initiate automated analysis of all resumes against the job description
- View ranked list of candidates with match scores
- Export or download ranked results (future enhancement)
- Reset dashboard for new position or new batch of candidates

Access Privileges: Employers have access to all resumes they upload and corresponding analysis results. They can view aggregated ranking data but cannot access other employers' job descriptions or candidate pools.

Security and Privacy Needs: Employers require assurance that uploaded job descriptions (which may contain confidential company information) are not exposed to candidates or other employers. They also need confidence that candidate data is handled ethically and in compliance with privacy regulations.

Success Criteria: Employers consider the system successful if it significantly reduces time-to-shortlist, improves the quality of candidates selected for interviews, and provides defensible, objective screening criteria.

2.2.3 Administrator Operations

User Profile: Administrator features including system monitoring, user management, audit logging, and advanced configuration capabilities are deferred to Phase 3 and are not required for the initial release. The Phase 1 system operates without dedicated administrator interfaces or authentication systems.

Future Scope: When implemented in future phases, administrators will be technical staff members responsible for system maintenance, monitoring, and support with expert-level technical skills including system administration, database management, log analysis, and troubleshooting.

Phase 1 Note: The initial demonstration system requires no administrator operations. System monitoring and maintenance are handled through standard development and deployment practices without specialized administrative interfaces.

2.3 General Constraints, Assumptions, and Dependencies

This section identifies the constraints that limit design choices, assumptions made during requirements definition, and external dependencies that may impact system development or operation.

Regulatory and Legal Constraints:

The system must comply with applicable data protection regulations, including GDPR (for European users) and relevant privacy laws in operational jurisdictions. Specific requirements include obtaining user consent for data processing, providing transparency about data usage, and ensuring the right to data deletion. The system must also avoid discriminatory practices in resume analysis, ensuring that matching algorithms do not inadvertently create bias based on protected characteristics.

Hardware Limitations:

The system is constrained by standard web server capabilities and must operate efficiently within typical cloud hosting resource allocations. Client-side performance is limited by end-user device capabilities, requiring optimization for devices with varying processing power and memory. The system must function on devices ranging from smartphones to desktop computers.

Interface Requirements:

The user interface must be compatible with major web browsers (Chrome, Firefox, Safari, Edge) in their current and previous major versions. The system must support accessibility standards (WCAG 2.1 Level AA) to accommodate users with disabilities. Mobile responsiveness is required to support users accessing the system from various device types.

Budget Constraints:

Development must occur within allocated budget limits, which may restrict the use of premium third-party services or libraries. Infrastructure costs must remain within operational budget constraints, potentially limiting server resources or requiring efficient resource utilization.

Time Constraints:

The initial version of the system must be delivered according to project timeline commitments. This may necessitate prioritizing core functionality over advanced features, with certain enhancements deferred to future releases.

Technology Constraints:

The system must use technologies and programming languages supported by the development team's expertise. Integration with external services is limited to those with reasonable licensing terms or open-source alternatives. The system cannot rely on proprietary algorithms or tools that would create vendor lock-in or excessive costs.

Assumptions:

1. Users have access to modern web browsers with JavaScript enabled and internet connectivity with sufficient bandwidth for file uploads.
2. Uploaded resume files are in standard PDF or DOCX format with extractable text (not scanned images without OCR).

3. Job descriptions provided by employers accurately represent position requirements and contain sufficient detail for meaningful analysis.
4. Users understand that match scores are indicative tools and not definitive assessments of candidate qualification or job fit.
5. The system will initially launch in English, with internationalization deferred to future releases.
6. Users will not attempt to upload excessively large files (exceeding 10 MB) or maliciously crafted documents.
7. Network connectivity between users and servers is reasonably stable and reliable.
8. Candidate resumes contain truthful information about qualifications and experience.

Dependencies:

1. Third-Party Libraries: The system depends on open-source libraries for PDF parsing (e.g., PDF.js, PDFBox) and DOCX processing (e.g., Apache POI, docx4j). Changes to these libraries or loss of maintenance could impact system functionality.
2. Hosting Infrastructure: System availability depends on cloud hosting provider uptime and performance. Outages or degraded performance at the infrastructure level will directly impact user access.
3. Browser Compatibility: System functionality depends on continued support for web standards in major browsers. Changes to browser security policies or JavaScript capabilities could require system updates.
4. Natural Language Processing Tools: Analysis accuracy depends on NLP libraries for text processing and similarity calculation. The quality of these tools directly impacts matching results.
5. File Format Standards: The system's ability to process documents depends on stability of PDF and DOCX format specifications. Significant format changes could require parsing library updates.
6. Security Protocols: Secure file upload and data transmission depend on HTTPS protocol support and SSL/TLS certificate validity.
7. Development Team Availability: Project progress depends on continued availability of development, testing, and deployment resources.

2.4 Apportioning of Requirements

This section identifies requirements that may be delayed until future system releases. This prioritization ensures that the initial version delivers core value while allowing for systematic enhancement over time.

Phase 1 – Initial Release (Current Scope):

Core functionality includes single resume upload and analysis for candidates, multiple resume upload and ranking for employers, basic text extraction from PDF and DOCX files, simple matching algorithm using keyword overlap or TF-IDF with cosine similarity for scoring, basic result display with numeric match scores (0-100) and categorical labels, and session-based temporary data storage with manual reset capability. Critical constraint: Only resume names and match scores are stored temporarily for employer ranking—no parsed text, extracted keywords, or personal content is persisted beyond the active session.

Phase 2 – Enhanced Analysis (Future Release):

Advanced features to be implemented in subsequent releases include detailed skill gap analysis showing specific missing qualifications, section-by-section resume breakdown with targeted scoring, synonym and contextual understanding in keyword matching, customizable scoring weight preferences for employers, visual analytics and charts showing score distributions, and export capabilities for ranked lists (CSV, PDF formats).

Phase 3 – User Management and Persistence (Future Release):

Features requiring authentication and persistent storage infrastructure include user registration and authentication systems, saved analysis history and comparison tools, persistent storage of past analyses and results, saved job descriptions and resume templates, user preference settings and customization options, administrator interfaces for system monitoring and management, role-based access control for employer teams, and audit logging for compliance.

Phase 4 – Integration and Automation (Future Release):

Advanced integration capabilities include API endpoints for third-party integrations with applicant tracking systems, email notification systems for new analysis results, automated resume submission for candidates to employer systems, bulk import from email attachments or cloud storage, webhook support for real-time updates, and integration with job boards and career sites.

Phase 5 – Intelligence and Learning (Future Release):

Machine learning enhancements include adaptive algorithms that learn from employer feedback on candidate quality, predictive analytics for interview success probability, industry-specific scoring models tailored to different sectors, automated resume improvement suggestions using AI, natural language understanding for complex job requirements, and advanced semantic analysis with contextual matching.

Phase 6 – Collaboration and Reporting (Future Release):

Enterprise features include multi-user employer accounts with team collaboration, role-based access control for hiring teams, commenting and annotation on candidate resumes, customizable reporting dashboards with KPIs, compliance tracking and audit trails, and hiring pipeline visualization.

Deferred Features:

The following features are considered out of scope for foreseeable releases: video resume analysis, social media profile integration, direct interview scheduling, background check integration, salary negotiation tools, candidate communication messaging, and mobile native applications for iOS/Android.

Prioritization Criteria:

Requirements are prioritized based on several factors including business value and user impact, technical complexity and development effort, dependency relationships between features, resource availability and budget constraints, risk and uncertainty levels, and market demand and competitive positioning. The development team will reassess priorities before each release phase based on user feedback, market conditions, and strategic objectives.

3. Specific Requirements

3.1 External Interface Requirements

User Interface Requirements:

The system shall provide two distinct web-based interfaces: a candidate interface for individual resume analysis and an employer interface for bulk resume screening. Both interfaces shall be responsive and functional on devices with screen sizes ranging from 320px (mobile) to 2560px (large desktop displays). The interfaces shall follow modern web design principles with intuitive navigation, clear visual hierarchy, and minimal cognitive load. Loading indicators shall be displayed during file uploads and processing operations. Error messages shall be presented in user-friendly language with actionable guidance for resolution.

Hardware Interface Requirements:

The system operates entirely through web browsers and requires no direct hardware interfaces beyond standard input devices (keyboard, mouse, touch screen). The server infrastructure shall support standard network interfaces for HTTP/HTTPS communication. File upload functionality shall accommodate standard file system access through browser file selection dialogs.

Software Interface Requirements:

The system shall interface with PDF parsing libraries capable of extracting text from Portable Document Format files conforming to PDF specifications version 1.7 or earlier. The system shall interface with DOCX processing libraries capable of parsing Microsoft Word Open XML documents conforming to ECMA-376 standard. The backend shall utilize NLP libraries providing tokenization, keyword extraction, and text similarity calculation capabilities. The system shall communicate with web browsers supporting HTML5, CSS3, and ECMAScript 2015 (ES6) standards. No integration with external APIs or third-party services is required for the initial release.

Communication Interface Requirements:

All client-server communication shall occur over HTTPS protocol using TLS 1.2 or higher encryption. File uploads shall use multipart/form-data encoding with appropriate Content-Type headers. Analysis results shall be transmitted as JSON-formatted responses with appropriate CORS headers if cross-origin requests are supported. The system shall implement appropriate HTTP status codes (200 for success, 400 for client errors, 500 for server errors) and error response structures. Communication timeout thresholds shall be set to 30 seconds for file uploads and 60 seconds for analysis operations.

3.2 Detailed Description of Functional Requirements

This section provides comprehensive descriptions of all functional requirements organized by user class. Each requirement is specified with sufficient detail to enable implementation and testing.

3.2.1 Borrower Functional Requirements

Note: This section should be titled "Candidate Functional Requirements" for consistency with the system domain.

FR-C-1: Resume Upload

The system shall allow candidates to upload a single resume file in PDF or DOCX format not exceeding 10 MB in size. The upload interface shall provide visual feedback during file transfer,

including progress indication for files larger than 1 MB. Upon successful upload, the system shall confirm receipt and display the uploaded file name. If the upload fails due to network issues, file size limits, or unsupported formats, the system shall display an appropriate error message and allow retry without requiring page refresh.

FR-C-2: Job Description Input

The system shall provide a text input area allowing candidates to paste or type job description text with no character limit below 50,000 characters. The interface shall support both plain text and formatted text input. The system shall provide a character counter to help users gauge the completeness of their input. Alternatively, the system shall allow users to upload job description files in PDF or DOCX format using the same validation rules as resume uploads.

FR-C-3: Resume Text Extraction

Upon receiving an uploaded resume, the system shall automatically extract all readable text content from the document, preserving semantic meaning while removing formatting artifacts. The extraction process shall handle multi-column layouts, headers, footers, and embedded tables. If text extraction fails or produces insufficient content (fewer than 100 characters), the system shall notify the user that the document may be an image-based scan or corrupted file and recommend uploading a text-based document.

FR-C-4: Resume Analysis Execution

When the candidate initiates analysis by clicking the "Analyze Resume" button, the system shall compare the extracted resume text against the provided job description using keyword matching and text similarity algorithms. The analysis shall complete within 10 seconds for documents containing up to 5,000 words. During processing, the system shall display a loading indicator with an informative message such as "Analyzing your resume against the job description..."

FR-C-5: Match Score Calculation

The system shall calculate a numerical match score ranging from 0 to 100, where 0 indicates no apparent match and 100 indicates exceptionally strong alignment. The score calculation shall consider keyword overlap, skill matching, experience level indicators, and overall semantic similarity between documents. The algorithm shall apply appropriate weighting to different content sections, giving higher priority to skills and experience over personal information sections.

FR-C-6: Results Display

Upon completion of analysis, the system shall display the match score prominently as a numeric value (0-100) using a visual indicator such as a progress circle or score gauge. The display shall include a categorical label based on the score range: "Strong Match" for scores 75-100, "Moderate Match" for scores 50-74, and "Weak Match" for scores below 50. The results screen shall provide a brief summary statement interpreting the score (e.g., "Your resume shows good alignment with this position"). Phase 1 does not require displaying matched keyword lists or detailed skill breakdowns—these are deferred to Phase 2.

FR-C-7: Analysis Reset

The candidate interface shall provide a clearly labeled "Reset" or "New Analysis" button that clears all uploaded files, input text, and analysis results from the current session. Upon reset, the system shall return the user to the initial upload state, ready for a new analysis. The reset operation shall require no confirmation for the initial release but shall complete instantaneously without requiring page reload.

FR-C-8: File Type Validation

Before processing any uploaded file, the system shall validate that the file extension is either .pdf or .docx (case-insensitive). The system shall also perform MIME type validation to ensure the file content matches the declared extension. Files with mismatched extensions or unsupported formats shall be rejected immediately with a clear error message specifying the supported formats. The validation shall occur before any file content is uploaded to the server to minimize bandwidth usage.

3.2.2 Employer Functional Requirements

FR-E-1: Job Description Upload/Input

The system shall allow employers to input a job description through either text entry (up to 50,000 characters) or file upload (PDF or DOCX, maximum 10 MB). The interface shall clearly indicate that this job description will be used as the comparison baseline for all uploaded candidate resumes. The system shall validate and extract text from uploaded job description files using the same extraction process as candidate resumes. Once a job description is provided, the system shall display a confirmation message and the first 200 characters as a preview to verify correct input.

FR-E-2: Multiple Resume Upload

The employer interface shall support simultaneous upload of multiple candidate resume files through either individual file selection or batch selection via the file picker dialog. The system shall accept between 1 and 50 resume files in a single upload operation. Each file must be in PDF or DOCX format and not exceed 10 MB individually. The total combined upload size shall not exceed 100 MB. The interface shall display a list of selected files with individual file names and sizes before upload begins. Users shall be able to remove individual files from the selection before initiating upload.

FR-E-3: Upload Progress Indication

During the upload of multiple resumes, the system shall display real-time progress information, including the number of files uploaded versus total files selected, current file being processed, and an overall completion percentage. If any individual file fails to upload or process, the system shall note the failure but continue processing remaining files. After all uploads complete, the system shall provide a summary showing successful uploads, failed uploads (with reasons), and an option to retry failed uploads.

FR-E-4: Batch Resume Analysis

When the employer initiates analysis by clicking the "Analyze All Resumes" button, the system shall process each uploaded resume against the provided job description. The processing shall occur asynchronously if the number of resumes exceeds 10, with status updates provided to the user. For each resume, the system shall: (1) extract text content, (2) calculate a match score using the scoring algorithm, and (3) store only the resume name and match score temporarily in session memory for ranking and display purposes. No parsed resume text, extracted keywords, or personal content shall be persisted or exposed to the employer interface. The analysis process shall handle up to 20 resumes within 2 minutes for Phase 1 demonstration purposes.

FR-E-5: Ranked List Generation

Upon completion of all resume analyses, the system shall automatically sort the candidates in descending order by match score, with the highest-scoring resume appearing first. Resumes with identical scores shall be ordered by upload sequence. The ranked list shall be generated immediately upon completion of the final analysis without requiring additional user action.

FR-E-6: Ranked List Display

The employer interface shall display the ranked candidate list in a table or list format showing only the resume file name (without path information) and corresponding match score for each candidate. No additional resume details, parsed content, or extracted attributes shall be displayed in Phase 1. The display shall support viewing all candidates on a single scrollable page if the list contains up to 20 entries. The highest-scoring candidate shall be visually distinguished through highlighting or prominent positioning. Each entry shall display the score as an integer value on the 0-100 scale with optional categorical labels (Strong/Moderate/Weak).

FR-E-7: Score Visualization

The ranked list display shall include basic visual indicators such as color coding (green for scores 75+, yellow for scores 50-74, red for scores below 50) or simple progress bars representing score magnitudes. Advanced visualizations such as interactive charts, heatmaps, and detailed analytics are deferred to Phase 2. This visual representation shall enable employers to quickly identify high-scoring candidates without requiring detailed analysis of numerical values.

FR-E-8: Employer Dashboard Reset

The employer interface shall provide a "Reset Dashboard" or "New Batch" button that clears the current job description, all uploaded resumes, and the ranked list. This operation shall prepare the interface for analysis of a new position or a new batch of candidates. The reset shall require no confirmation in the initial release and shall execute immediately.

FR-E-9: Error Handling for Failed Analyses

If analysis fails for one or more resumes due to extraction errors, parsing failures, or processing exceptions, those resumes shall be flagged in the results display with an error indicator and excluded from the ranked list. The employer shall be notified of the number of failed analyses and provided with the names of affected resume files. The system shall provide general guidance for resolution, such as requesting different file formats from candidates.

3.3 Performance Requirements

Response Time Requirements (Phase 1 Demonstration Targets):

The system shall complete resume text extraction within 10 seconds for files up to 5 MB containing up to 10 pages. Match score calculation for a single resume-job description pair shall complete within 15 seconds on standard development hardware. Batch analysis of up to 20 resumes shall complete within 2 minutes (average of 6 seconds per resume). The user interface shall respond to user interactions (button clicks, form submissions) within 500 milliseconds. Page load times shall not exceed 5 seconds on broadband connections (5+ Mbps). File upload initiation shall begin within 1 second of file selection.

Note: These are demonstration targets for a college project prototype. Production-grade performance SLAs including concurrent user limits, throughput requirements, and uptime guarantees are deferred to future commercial deployment phases.

3.4 Quality Attributes

Usability:

The system shall be intuitive enough that first-time users can successfully complete an analysis without training or external documentation. The user interface shall provide clear feedback for all operations, including success confirmations, progress indicators, and error messages. Help text and tooltips shall be available for key features without cluttering the interface. The candidate and employer interfaces shall follow consistent design patterns and terminology.

Accessibility:

The system shall implement basic accessibility features including keyboard navigation for all interactive elements, text labels for form inputs to support screen readers, and sufficient color contrast for readability. Full WCAG 2.1 Level AA compliance is a goal for future releases but is not required for Phase 1 demonstration. Alternative text shall be provided for informational images and icons.

Reliability:

The system shall handle unexpected inputs gracefully without crashing or requiring restart. File parsing errors shall not cause system-wide failures but shall be isolated to individual analysis sessions. Data integrity shall be maintained through validation checks at all input points. Session state shall be preserved during brief network interruptions lasting up to 30 seconds.

Availability:

For demonstration purposes, the system should be accessible when needed for testing and evaluation. Production-grade uptime SLAs (99.5% uptime, MTBF/MTTR targets) are not required for Phase 1 but are recommended for commercial deployment.

Security:

All data transmission shall be encrypted using HTTPS with TLS 1.2 or higher when deployed to any publicly accessible environment. Uploaded files shall be validated for file type, size, and basic content structure to prevent malicious uploads. The system shall implement basic rate limiting to prevent abuse, allowing no more than 20 analysis requests per user per hour in deployed environments. Input validation shall prevent injection attacks (SQL injection, XSS, etc.) at all entry points. Session data shall expire after 60 minutes of inactivity. Temporary files shall be deleted after session completion or within 24 hours, whichever occurs first. Advanced security features such as malware scanning, comprehensive audit logging, and strict rate limiting are recommended for production deployment but are not required for Phase 1 demonstration.

Privacy Note: The system shall not log or persist personally identifiable information (PII) from resumes beyond the active session. Users shall be informed through a brief privacy notice that their data is session-only and not permanently stored.

Maintainability:

The codebase shall follow established coding standards and style guides for the chosen programming languages. Code shall be modular with clear separation of concerns between presentation, business logic, and data processing layers. Basic inline documentation shall explain complex logic and algorithms. The system shall implement logging at appropriate levels (INFO, WARN, ERROR) to facilitate troubleshooting. Configuration parameters shall be externalized to enable updates without code changes.

Portability:

The system shall function correctly on all major operating systems (Windows, macOS, Linux, iOS, Android) through web browser access. The system shall support the current and previous major versions of Chrome, Firefox, Safari, and Edge browsers. The backend system shall be deployable on multiple cloud platforms (AWS, Azure, Google Cloud) or on-premises infrastructure without significant modification. The system shall use standard protocols and formats to avoid vendor lock-in.

Compatibility:

The system shall correctly parse PDF files conforming to PDF specification versions 1.0 through 2.0. The system shall correctly parse DOCX files conforming to Office Open XML (ECMA-376) standards. The system shall gracefully handle documents created by various word processing applications (Microsoft Word, Google Docs, LibreOffice, Apple Pages) when exported to supported formats. The system shall function on devices with screen resolutions ranging from 320x568 (iPhone SE) to 2560x1440 (QHD monitors).

3.5 Other Requirements

Legal and Regulatory Requirements:

The system shall implement session-only data handling to minimize privacy concerns. Users shall be informed through a brief privacy notice that uploaded documents are processed temporarily and not permanently stored. The system shall not discriminate based on protected characteristics in its matching algorithms. The system shall display appropriate disclaimers indicating that match scores are tools for assessment and not guarantees of qualification or suitability. Full GDPR/CCPA compliance workflows including formal consent mechanisms, data portability, and detailed audit trails are important for commercial deployment but are not required for Phase 1 academic demonstration.

Business Rules:

Resume files and extracted text shall be deleted from temporary storage immediately upon session reset or within 24 hours of upload, whichever occurs first. Match scores shall be calculated using consistent algorithms across all analyses to ensure fairness and comparability. The system shall not allow users to download or export other users' resumes or confidential information.

Data Retention and Privacy - Canonical Storage Rule:

Phase 1 Storage Policy: Only resume file names and match scores are stored temporarily in session memory for employer ranking and display purposes. Parsed resume text, extracted keywords, skill lists, and any personally identifiable information are NOT persisted beyond the duration of the analysis operation. All temporary data exists only in memory or temporary directories during active processing and is automatically cleared upon session termination, user-initiated reset, or after 24 hours of inactivity.

Accessibility Requirements:

The system shall conform to Web Content Accessibility Guidelines (WCAG) 2.1 Level AA standards. All interactive elements shall be keyboard-accessible without requiring a mouse. Form inputs shall have associated labels for screen reader compatibility. Color shall not be the sole means of conveying information (e.g., score quality). Sufficient color contrast ratios shall be maintained (4.5:1 for normal text, 3:1 for large text). Alternative text shall be provided for all images and icons. Time limits for interaction shall be avoidable, adjustable, or extendable for users requiring additional time.

Internationalization and Localization:

The initial release shall support English language for both interface and content analysis. The system architecture should use UTF-8 character encoding to facilitate future multi-language support. Multi-language interfaces and language-specific analysis capabilities are deferred to Phase 2+.

4. System Features

4.1 Description and Priority

This section organizes functional requirements by system features, describing each feature's business value, technical priority, and implementation considerations. Features are prioritized using the MoSCoW method: Must Have, Should Have, Could Have, and Won't Have (for current release).

Feature 1: Candidate Resume Analysis (Must Have - Priority 1)

This feature enables individual job seekers to evaluate their resume against specific job descriptions. It represents the core value proposition for candidate users and must be included in the minimum viable product. The feature directly addresses the problem of candidates lacking objective feedback on their application competitiveness. Success metrics include task completion rate above 95%, average analysis time under 15 seconds, and user satisfaction scores above 4.0/5.0.

Feature 2: Employer Batch Resume Screening (Must Have - Priority 1)

This feature enables recruiters to efficiently screen multiple candidate resumes simultaneously against a job description. It represents the primary value proposition for employer users and is essential for product-market fit in the recruiting tools market. The feature directly addresses the problem of time-consuming manual resume review. Success metrics include successful processing of 50 resume batches, average processing time under 3 seconds per resume, and employer time savings of at least 70% compared to manual review.

Feature 3: Multi-Format Document Support (Must Have - Priority 1)

This feature ensures the system can process the two most common resume formats: PDF and DOCX. Supporting both formats is essential because candidates and employers use different tools and preferences for document creation. Without multi-format support, the system would exclude significant portions of the target user base. Success metrics include successful text extraction from 90% of submitted documents and support for documents created by major word processing applications.

Feature 4: Intelligent Match Scoring Algorithm (Must Have - Priority 1)

This feature implements the core logic for comparing resume content with job descriptions to generate meaningful compatibility scores. The quality of this algorithm directly impacts user trust and system value. Phase 1 shall implement a straightforward scoring approach using TF-IDF vectorization with cosine similarity OR simple keyword overlap with frequency weighting. The algorithm must balance simplicity with reasonable accuracy to provide actionable insights. Success metrics include score consistency (similar resumes receive similar scores) and reasonable discrimination (clearly qualified candidates score noticeably higher than unqualified ones).

Feature 5: Basic Results Visualization (Should Have - Priority 2)

This feature provides simple visual representation of match scores through color-coded badges, progress indicators, and basic categorical labels (Strong/Moderate/Weak). Advanced visualizations such as interactive charts, detailed gauges, skill heatmaps, and analytics dashboards are deferred to Phase 2. The Phase 1 visualization focuses on clarity and quick comprehension without requiring complex charting libraries.

Feature 6: Detailed Match Breakdown (Phase 2 - Deferred)

This feature would expand basic scoring to show specific areas of alignment and gaps, such as identified missing skills, experience mismatches, or qualification deficiencies with severity ratings. While valuable for users seeking detailed feedback, this feature requires significant additional development for natural language understanding, entity extraction, and structured skill taxonomies. It is explicitly deferred to Phase 2 to keep the initial release focused and achievable. Success metrics when implemented include actionable feedback items identified per analysis and user perception that feedback is helpful.

Feature 7: Export and Reporting Capabilities (Phase 2 - Deferred)

This feature would enable users to export analysis results, ranked lists, and reports in formats such as PDF, Excel, or CSV. For Phase 1, a simple browser-based export using `window.print()` or basic CSV download of the ranked list is acceptable for demonstration purposes, but formatted PDF report generation is explicitly deferred to Phase 2. While convenient for record-keeping and sharing, comprehensive export formatting adds complexity around document generation and layout. Success metrics when implemented include usage rate by employers and preferred export formats.

Feature 8: Historical Analysis Tracking and User Accounts (Phase 3 - Deferred)

This feature would allow users to create accounts, save and compare multiple analyses over time, track resume improvements, or compare multiple job descriptions. It requires user authentication systems, persistent database storage, and user account management infrastructure, which significantly increase system complexity and deployment requirements. This feature is explicitly deferred to Phase 3 pending successful validation of core functionality in Phase 1. It will be reconsidered after initial market response is evaluated and if there is demonstrable user demand for persistent storage features.

4.2 Functional Requirements

4.2.1 System Architecture and Technology Stack

Frontend Architecture:

The system shall implement a modern single-page application (SPA) architecture using React.js or Vue.js framework for component-based UI development. The frontend shall communicate with the backend through RESTful API endpoints using JSON data format. State management shall be handled through React Context API or Vuex for consistent data flow. The frontend shall implement responsive design using CSS frameworks such as Tailwind CSS or Bootstrap 5 to ensure cross-device compatibility. Client-side validation shall provide immediate feedback before server submission to improve user experience.

Backend Architecture:

The system shall implement a RESTful API using Node.js with Express framework or Python with Flask/Django framework. The backend shall follow a modular architecture with distinct layers for routing, business logic, and data processing. Asynchronous processing shall be implemented for time-intensive operations such as batch resume analysis to prevent request timeouts. The backend shall implement appropriate error handling middleware to catch and format exceptions consistently.

Document Processing Layer:

For PDF processing, the system shall utilize libraries such as PDF.js (JavaScript), PyPDF2 or pdfplumber (Python), or Apache PDFBox (Java). For DOCX processing, the system shall utilize libraries such as Mammoth.js (JavaScript), python-docx (Python), or Apache POI (Java). The document processing layer shall implement fallback mechanisms to attempt alternative extraction

methods if the primary parser fails. Extracted text shall be cleaned to remove excessive whitespace, special characters, and formatting artifacts that do not contribute to semantic meaning.

Analysis Engine:

Phase 1 Scoring Approach: The matching algorithm shall implement a straightforward scoring method using one of the following approaches: (1) TF-IDF (Term Frequency-Inverse Document Frequency) vectorization to represent documents as numerical vectors with cosine similarity calculation to measure document similarity, OR (2) Controlled keyword overlap with frequency-based weighting to score term matches between resume and job description. The engine shall implement basic keyword extraction to identify important terms and phrases. Stop word removal shall normalize text before analysis. The scoring algorithm shall scale raw similarity scores to the user-facing score range (0-100) using appropriate transformation functions.

Advanced Features (Phase 2+): Synonym recognition and contextual matching, domain-specific dictionaries for industries (IT, healthcare, finance, etc.), semantic analysis beyond simple keyword matching, and customizable scoring weights are deferred to Phase 2 and beyond.

Data Storage:

Phase 1 Approach: The system shall use in-memory session storage or temporary file system directories for uploaded documents during active sessions. Critically, only resume file names and match scores are stored temporarily for employer ranking—no parsed resume text, extracted keywords, or personal content is persisted. No persistent database is required for core Phase 1 functionality. All temporary files shall be stored in secured directories with restricted access permissions and automatic cleanup routines that execute on session termination or after 24 hours.

Future Phases: If persistence becomes necessary in Phase 3+, a database such as PostgreSQL, MySQL, or MongoDB may be introduced for user accounts, saved analyses, and historical data, with appropriate data protection measures.

Security Infrastructure:

The system shall implement HTTPS encryption for all client-server communication using SSL/TLS certificates from recognized certificate authorities. File uploads shall be validated for file type, size, and content signatures to prevent malicious uploads. The backend shall implement rate limiting middleware to prevent abuse and DoS attacks. Input sanitization shall be applied to all user-provided text to prevent injection attacks. Security headers (CSP, X-Frame-Options, X-Content-Type-Options) shall be configured appropriately.

Deployment Infrastructure:

The system shall be deployable on cloud platforms such as AWS (EC2, S3, Lambda), Azure (App Service, Functions), or Google Cloud Platform (Compute Engine, Cloud Functions). Containerization using Docker shall enable consistent deployment across environments. The system shall support both serverless (for variable traffic) and traditional server deployments (for predictable loads). Environment-specific configuration shall be managed through environment variables or configuration files external to the codebase.

4.2.2 Feature Enhancements

Enhanced Keyword Matching (Phase 2):

Future versions shall implement contextual keyword matching that recognizes synonyms, related terms, and industry-specific jargon. For example, "machine learning" and "ML" shall be recognized as equivalent, and "customer service" shall match "client relations." The system shall maintain

domain-specific dictionaries for common fields such as IT, healthcare, finance, and engineering. Users shall have the ability to customize or weight specific keywords based on their importance to the position.

Skill Gap Analysis (Phase 2):

An enhanced version shall identify specific skills mentioned in the job description but absent from the resume, presenting these as "missing qualifications" with severity ratings. The system shall categorize gaps as critical (required qualifications), important (preferred qualifications), or nice-to-have (bonus qualifications). Candidates shall receive actionable recommendations such as "Consider adding experience with Python programming" or "Highlight your project management certification."

Custom Scoring Weights (Phase 2):

Employers shall be able to specify custom weights for different criteria, such as prioritizing skills over experience or education over certifications. The system shall recalculate scores based on these preferences and re-rank candidates accordingly. Preset templates for common weighting schemes (entry-level positions, senior roles, technical positions) shall be provided.

Candidate Comparison View (Phase 2):

Employers shall be able to select multiple candidates and view side-by-side comparisons of their scores, strengths, and weaknesses. This feature shall facilitate final decision-making when multiple candidates have similar overall scores. Comparison shall highlight differentiating factors between candidates.

Analysis History and Trends (Phase 3):

Users with accounts shall be able to view historical analyses, track resume improvements over time, and compare different versions. Employers shall see trends in candidate pool quality, average scores by source or time period, and hiring success rates correlated with match scores. This feature requires implementation of user authentication and persistent storage infrastructure.

Improved Results Export:

Beyond basic data export, enhanced versions shall generate professional PDF reports with company branding, detailed analysis breakdowns, visual charts, and candidate recommendations. Employers shall be able to generate shortlist reports to share with hiring managers or interview panels. Candidates shall receive downloadable improvement reports with specific suggestions.

Mobile Application:

Native mobile applications for iOS and Android shall provide optimized experiences for on-the-go analysis, push notifications for completed analyses, and mobile-optimized file management. The mobile experience shall support quick resume checks during job browsing and instant candidate reviews for recruiters.

5. Change History

Version	Date	Author	Description of Changes
1.0	October 30, 2025	Development Team	Initial SRS document creation. Defined all core requirements for Resume-Job Description Matching System including candidate analysis, employer screening, functional requirements, performance specifications, and quality attributes. Established system architecture and technology stack recommendations.

Future Change Management

All subsequent modifications to this SRS document shall be recorded in this section with the following information:

- Version Number: Incremented using semantic versioning (Major.Minor.Patch)
- Date: Date the change was approved and incorporated
- Author: Individual or team responsible for the change
- Description: Detailed explanation of what was modified, added, or removed
- Rationale: Business or technical justification for the change
- Impact Assessment: Affected sections, dependencies, and implementation implications
- Approval: Stakeholders who reviewed and approved the change

Changes shall be categorized as:

- Major Changes: Fundamental alterations to system scope, architecture, or core functionality requiring version number increment (e.g., 1.0 to 2.0)
- Minor Changes: Feature additions, requirement clarifications, or non-breaking enhancements requiring minor version increment (e.g., 1.0 to 1.1)
- Patch Changes: Corrections, clarifications, formatting improvements, or minor updates requiring patch version increment (e.g., 1.0 to 1.0.1)

All changes must be reviewed and approved by the project manager and relevant stakeholders before incorporation into the official SRS document.

Appendix A: Glossary

Applicant Tracking System (ATS): Software application that enables electronic handling of recruitment needs, typically including features for job posting, application management, resume parsing, and candidate tracking.

Batch Processing: The execution of a series of jobs on a computer without manual intervention, in this context referring to the simultaneous analysis of multiple resumes.

Cosine Similarity: A metric used to measure how similar two documents are, calculated as the cosine of the angle between two non-zero vectors in an inner product space.

Natural Language Processing (NLP): A branch of artificial intelligence concerned with giving computers the ability to understand text and spoken words in the same way humans can.

TF-IDF (Term Frequency-Inverse Document Frequency): A numerical statistic that reflects how important a word is to a document in a collection of documents, commonly used in information retrieval and text mining.

Tokenization: The process of breaking down text into smaller units called tokens, typically words or phrases, for analysis.

Vector Space Model: An algebraic model for representing text documents as vectors of identifiers, enabling mathematical operations for comparison and analysis.

Appendix B: Requirements Traceability Matrix

This matrix maps functional requirements to system features, test cases, and implementation components to ensure complete coverage and traceability throughout the development lifecycle.

Requirement ID	Feature	Priority	Test Case ID	Implementation Component
FR-C-1	Candidate Resume Analysis	Must Have	TC-001	FileUploadController
FR-C-2	Candidate Resume Analysis	Must Have	TC-002	JobDescriptionInput
FR-C-3	Multi-Format Support	Must Have	TC-003	DocumentParser
FR-C-4	Candidate Resume Analysis	Must Have	TC-004	AnalysisEngine
FR-C-5	Match Scoring Algorithm	Must Have	TC-005	ScoringAlgorithm
FR-C-6	Results Visualization	Should Have	TC-006	ResultsDisplay
FR-C-7	Candidate Resume Analysis	Must Have	TC-007	SessionManager
FR-C-8	Multi-Format Support	Must Have	TC-008	FileValidator
FR-E-1	Employer Batch Screening	Must Have	TC-009	EmployerDashboard
FR-E-2	Employer Batch Screening	Must Have	TC-010	BatchUploadController
FR-E-3	Results Visualization	Should Have	TC-011	ProgressIndicator
FR-E-4	Employer Batch Screening	Must Have	TC-012	BatchAnalysisEngine
FR-E-5	Match Scoring Algorithm	Must Have	TC-013	RankingAlgorithm
FR-E-6	Results Visualization	Should Have	TC-014	RankedListDisplay
FR-E-7	Results Visualization	Should Have	TC-015	ScoreVisualization
FR-E-8	Employer Batch Screening	Must Have	TC-016	DashboardReset
FR-E-9	Employer Batch Screening	Should Have	TC-017	ErrorHandler