PROJECT PROPOSAL

RESUME SCREENING SYSTEM

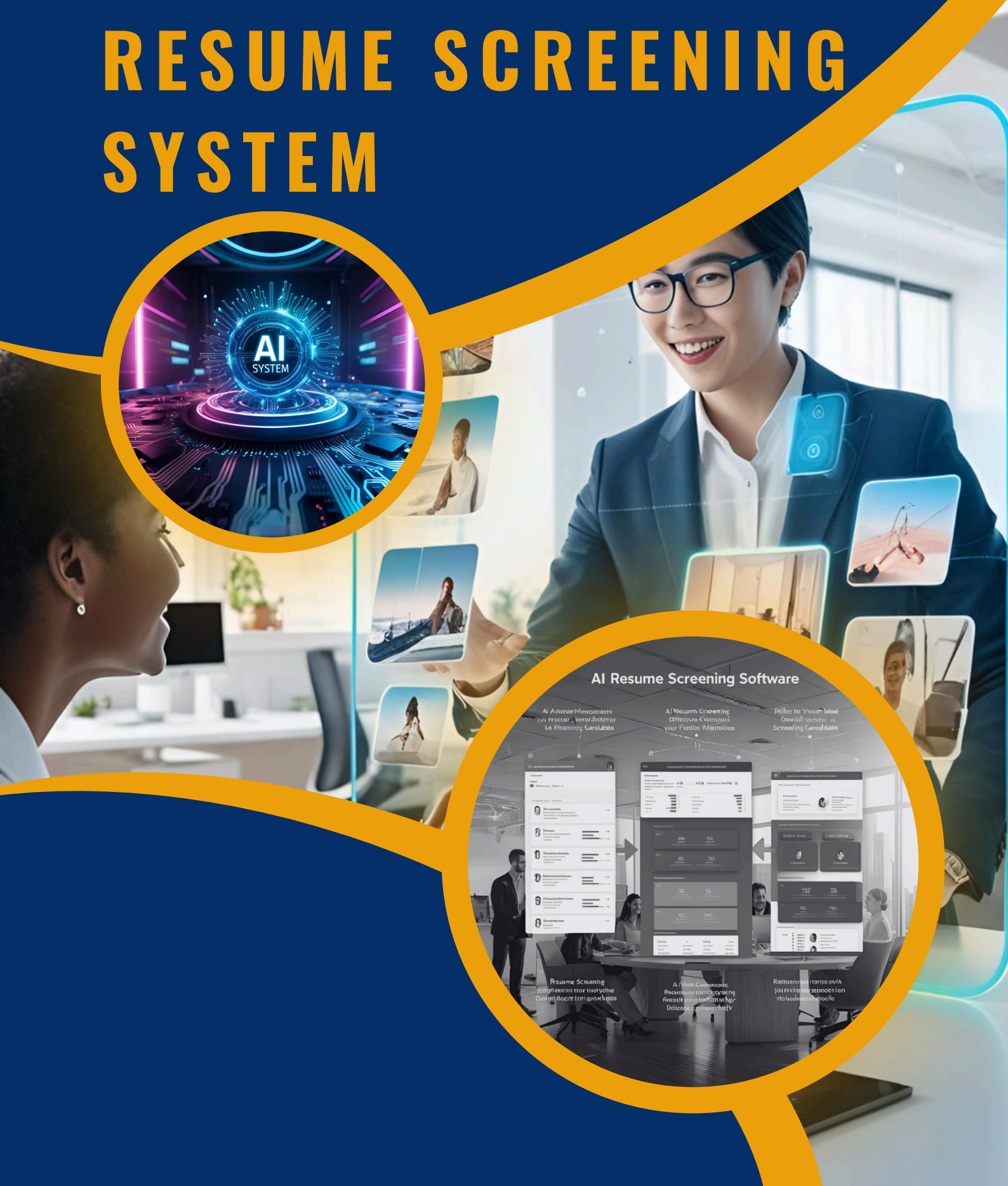

Table of Contents

Project Proposal: AI-Powered Resume Screening System

1. Introduction

In today's competitive job market, recruiters and hiring managers face the challenge of efficiently screening hundreds of resumes while ensuring fair and accurate candidate selection. The **AI-Powered Resume Screening System** is an automated solution designed to streamline this process by leveraging advanced **Natural Language Processing (NLP)** and **machine learning** techniques to parse, analyze, and rank resumes based on job requirements.

This document outlines the **technical specifications, objectives, and expected outcomes** of the system, providing a clear roadmap for development and deployment.

---

2. Objectives

The primary objectives of this system are:

- **Automate Resume Screening** – Reduce manual effort by automatically parsing and ranking resumes.
- **Improve Hiring Accuracy** – Utilize AI-driven matching to identify the most qualified candidates based on skills, experience, and education.
- **Enhance Efficiency** – Significantly reduce the time required for initial candidate screening.
- **Minimize Bias** – Implement objective ranking algorithms to reduce human bias in candidate selection.

---

3. Technical Specifications

3.1 Core Features

Resume Parsing & Storage

- Supports multiple file formats (**PDF, DOCX, TXT**).
- Extracts key candidate information (**skills, work experience, education**).

AI-Powered Candidate Ranking

- **TF-IDF (Default Algorithm)** – Measures keyword relevance between resumes and job descriptions.
- *A Search Algorithm** – Optimizes ranking by combining skill matching and experience heuristics.
- **Naïve Ranking** – Provides a baseline comparison for validation.

Interactive Dashboard

- Displays ranked candidates with **match scores**.
- Highlights key **qualifications and skills**.

Secure & Scalable Architecture

- Configurable upload directory with **access controls**.
- Compatible with **Windows, macOS, and Linux environments**.

3.2 Technology Stack

Component	Technology Used
Backend Framework	Python (Flask)
Frontend	HTML5, Bootstrap 5, JavaScript
Natural Language Processing	spaCy, scikit-learn
Data Processing	pandas, NumPy
Deployment	Local (Flask), Docker (optional)

---

4. System Architecture

4.1 Workflow Overview

1. **Resume Upload** – Users upload resumes via a web interface.
2. **Data Extraction** – The system parses text from resumes and extracts structured data.
3. **Job Description Input** – Recruiters provide a job description for matching.
4. **AI Matching & Ranking**:
    - **TF-IDF** calculates keyword similarity.
    - *A Search** refines rankings using skill and experience heuristics.
5. **Results Display** – Candidates are displayed in order of relevance with detailed insights.

4.2 Key Algorithms

TF-IDF (Term Frequency-Inverse Document Frequency)

- Computes the **importance of keywords** in resumes relative to the job description.

A Search Algorithm*

- Evaluates candidates based on **multiple factors (skills, experience)** to optimize rankings.

Naïve Ranking

- Sorts candidates based on **simple keyword frequency** (baseline reference).

---

5. Expected Outcomes

- **Reduced Screening Time** – Automating initial resume screening cuts processing time by **70% or more**.
- **Higher Quality Matches** – AI ensures only the most relevant candidates proceed to interviews.
- **Scalability** – The system can handle **hundreds of resumes** without performance degradation.
- **Bias Mitigation** – Objective algorithms reduce unconscious bias in hiring.

---

6. Future Enhancements

- **Machine Learning Model** – Train on historical hiring data to improve matching accuracy.
- **Multi-Language Support** – Expand parsing capabilities for non-English resumes.
- **Applicant Tracking System (ATS) Integration** – Connect with platforms like Greenhouse or Workday.
- **Advanced Analytics Dashboard** – Provide hiring managers with **insights into candidate pools**.

---

7. Conclusion

The **AI-Powered Resume Screening System** offers a **robust, efficient, and scalable** solution for modern recruitment challenges. By automating the **initial screening process**, organizations can allocate more time to evaluating **top candidates** while ensuring **fairness and consistency** in hiring decision.