National University of Computer and Emerging Sciences

Software Engineering Project

Submitted To: Miss Mehroz Khan

Section: 6-E

Project Proposal

Project Name: Resume Analyzer

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Project Proposal

Problem Statement

Overview:
In today's competitive job market, recruiters receive a large volume of resumes for every job posting. Manually screening and evaluating resumes is a time-consuming and inefficient process. Many applicants struggle with optimizing their resumes according to job requirements, leading to missed opportunities.

Solution:
Resume Analyzer tackles these problems with a machine-learning and natural language processing approach designed to automate resume screening.

Objectives:

- Resume evaluation is automated using the job descriptions.
- Resume strengths and weaknesses are reported.
- The resumes of applicants can be optimized to get better jobs.
- It facilitates the recruitment process for employers.

Project Scope

Project Boundaries:

Resume Analyzer is a tool that will analyze and optimize resumes based on job descriptions. It will extract key details, compare resumes with job requirements, and give feedback. However, it will not handle job applications or direct recruiter interactions.

Inclusions:
The following features will be included in the project:
Resume Parsing: Extract key details such as experience, skills, and education.
Keyword Matching: Compare resumes against job descriptions.
Automated Scoring: Score against relevance to the job.
Feedback & Suggestions: Suggest improvement.
ATS Compatibility Check: Ensuring resumes are ATS-friendly.

Exclusions:
The project shall not comprise:

- Real-time submission of job applications.
- Direct engagement with recruitment portals.
- Handwritten resume writing service.

Assumptions:

- The users will upload resumes in standard formats (PDF, DOCX).
- The job description will be available for comparison.
- AI models will be trained on publicly available job market data.

Tools and Technologies

Programming Languages:
Frontend: HTML, CSS, JavaScript
Backend: Python

Frameworks and Libraries:
Frontend: React.js (for creating an interactive and dynamic user interface)
Backend: Flask or Django (to manage API requests and backend logic efficiently)
Database: MySQL (to store user data and resume analysis results)

Suitability of Chosen Technologies:
HTML, CSS, JavaScript: Ensures a responsive and visually appealing frontend.
React.js: Provides a fast, scalable, and component-based UI for seamless user experience.
Python: Provides robust support for data processing and AI-based resume analysis.
Flask/Django: Lightweight and efficient frameworks for handling backend operations.
MySQL: Ensures structured and reliable data storage.

Third-Party Libraries & Services:
NLTK or spaCy: Natural Language Toolkit and **spaCy** are both widely used for text analysis and keyword extraction
Pandas & NumPy: For handling and processing resume data.
Cloud Storage (if needed): AWS S3 or Firebase for storing uploaded resumes.

Review of Similar Existing Projects

There are many resume analysis tools that can help job seekers optimize their resumes for ATS and job descriptions. Below is a brief review of similar solutions:

Existing Solutions:

Jobscan:

Compares resumes with job descriptions for ATS optimization.
Strengths: Strong keyword matching and scoring system.

Weaknesses: Limited free scans; premium features require payment.

Resume Worded:

AI-powered resume reviewer with instant feedback.
Strengths: Provides personalized suggestions for improvement.
Weaknesses: Limited accuracy in keyword analysis.

Zety Resume Builder:

Helps write a resume by using pre-made templates
Advantages: easy to use, proposes formatting
Lagging : focus on the structure not content optimization.

Feature	Jobscan	Resume Worded	Zety	My Resume Analyzer
ATS Compatibility	Yes	No	No	Yes
Keyword Matching	Yes	Yes	No	Yes
Resume Scoring	Yes	Yes	Yes	Yes
Free Version	No	Yes	Yes	Yes
Feedback	Yes	Yes	Yes	Yes

References:

- Smith, J. & Brown, L. (2021). *Optimizing Resumes for ATS: A Data-Driven Approach*. Journal of Employment Technologies, 28(2), 67-80.
- Jobscan: Retrieved from https://www.jobscan.co
- Resume Worded: Retrieved from https://www.resumeworded.com
- Zety: Retrieved from https://zety.com/resume-builder

What Makes Our Project Different?

Our Resume Analyzer stands out from existing solutions by providing a free, AI-driven resume evaluation that ensures job seekers can optimize their resumes efficiently without premium subscriptions.

Unique Features and Innovations

- **AI-Powered Keyword Matching** – Analyzes resumes against job descriptions to highlight missing keywords.
- **ATS Compatibility Check** – Ensures resumes pass through Applicant Tracking Systems without formatting issues.
- **Personalized Feedback** – Provides targeted suggestions to improve structure, clarity, and content.
- **Skill Gap Analysis** – Identifies missing skills based on industry trends and job descriptions.
- **User-Friendly Interface** – Simple and intuitive platform for both beginners and professionals.

How Our Project Addresses Unmet Needs

Unlike existing tools that either require **paid access** or focus only on **formatting**, our Resume Analyzer offers:

- **A completely free solution** for job seekers to improve their resumes.
- **More detailed insights** into skill gaps and ATS optimization.
- **Real-time feedback** instead of just static resume templates.

By combining natural language processing (NLP) with machine learning, our project provides better accuracy and personalized career guidance, making it a valuable tool for job seekers.