**AI-Resume-Analyzer**

**A PROJECT REPORT**

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**BONAFIDE CERTIFICATE**

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**ABSTRACT**

The AI Resume Analyzer project is a reaction to the biases and inefficiencies present in conventional resume screening techniques, which are a major problem in today's hiring environment. The topic is established as a relevant consulting issue by statistical data and industry reports that highlight the drawn-out hiring processes and the qualified applicants that are overlooked because of manual biases. The necessity for an efficient and objective resume screening solution is confirmed by employer and job seeker surveys, and the industry's requirement for cutting-edge technologies is further highlighted by studies from HR agencies and technology research groups.

The shortcomings of traditional screening, such as time inefficiencies and subjectivity biases, are the main issue that has been highlighted. The project's duties are carefully laid out, starting with a thorough analysis of the literature to comprehend the promise of AI and the challenges that now exist. The AI Resume Analyzer system design, machine learning and natural language processing integration, and stakeholder insights surveying are the next responsibilities.

From the introduction to the literature review, problem identification, tasks and methods, chronology, outcomes and evaluation, difficulties, and future directions, the report's structure guarantees a cogent narrative. The project timetable is represented graphically by the Gantt chart. Results and Evaluation highlight the project's accomplishments and highlight the usefulness of the AI Resume Analyzer. Challenges and Future Directions identify the difficulties encountered throughout development and suggest directions for additional study and advancement. Key findings are outlined in the conclusion, which highlights the AI Resume Analyzer's revolutionary potential to modernize the hiring process. All things considered, the initiative represents a major step forward in developing a neutral, effective, and objective method of screening resumes that is in line with the ever-changing demands of modern hiring procedures.

**GRAPHICAL ABSTRACT**

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# INTRODUCTION

## Client Identification/Need Identification/Identification of relevant Contemporary issue

## The AI Resume Analyzer project was started in response to an urgent problem that was identified in the current recruiting environment. The hiring process is hampered by the inefficiencies and biases of traditional resume screening techniques, which affect both businesses and job seekers. We examine recorded evidence from industry sources as well as statistical data to demonstrate the importance and urgency of this issue.

## Justification based on Documentation and Statistics:

## Studies and industry reports continually show how labor-intensive and prone to error the traditional hiring process is, given its heavy reliance on manual resume screening. An average recruiter reviews one CV for 15-30 minutes. Candidates are placed later and recruiting cycles are prolonged as a result of this inefficiency.

## Furthermore, data show a notable discrepancy between job candidates' qualifications and their interview success rate.

## Consultancy Problem and Survey Validation:

## Analyzing the problem as a consultancy problem makes it clear that a solution is required. Companies have difficulty finding the right personnel quickly and streamlining their hiring procedures. Surveys with various firms and job seekers from a variety of industries were done to confirm this demand.

## The survey's findings underscore the difficulties that both hiring parties face. While job applicants lament the lack of feedback and possibilities lost while having relevant qualifications, employers are frustrated with the time-consuming nature of traditional screening.

## Relevant Contemporary Issue in Report:

## Moreover, reports from esteemed technological research groups and HR agencies, various reports support the difficulties the sector is facing. These studies stress how critical it is to quickly implement cutting-edge technology, such as artificial intelligence (AI), to transform the hiring process and lessen biases in the candidate selection process.

## To summarize, statistical data and written reports are used to identify the current problem, which emphasizes the biases and inefficiencies in traditional resume screening. In response to these issues, the AI Resume Analyzer project was born, with the goal of offering companies and job seekers alike a technologically sophisticated, impartial, and effective answer.

## Identification of Problem

## The main issue found is that traditional resume screening techniques are inadequate to match the changing needs of the contemporary employment market. Manual screening procedures take a lot of time, are prone to mistakes, and frequently add personal prejudices, which results in a less-than-ideal candidate pool. Employers and job searchers lose out on qualified candidates as a result of the overuse of keyword matching and restrictive criteria, which prolongs the hiring process. The identified issue is a fundamental barrier that impedes workforce optimization and organizational efficiency rather than just a technical or procedural limitation. In order to overcome these obstacles, the AI Resume Analyzer project will use artificial intelligence to transform the resume screening procedure, making it more efficient, objective, and adaptable to the changing demands of modern hiring.

## Identification of Tasks

## The duties include a methodical approach to solving the problem that has been discovered. Initially, a thorough literature analysis will be done to comprehend the shortcomings of current approaches and the possibilities of artificial intelligence in resume screening. The next set of responsibilities will be creating the AI Resume Analyzer system, which will include creating objective standards for evaluating resumes. In order to extract and analyze pertinent information from resumes, machine learning algorithms and Natural Language Processing (NLP) approaches must be integrated. Employers and job seekers will also be given surveys to complete in order to learn more about their requirements and expectations. In order to ensure adaptation to changing recruitment trends, implementation will also entail the development of a continuous learning system and a debiasing mechanism. These tasks collectively form the framework for the systematic development of an innovative solution to streamline and enhance the resume screening process.

## Timeline

Define the timeline (preferably using a Gantt chart)

## Organization of the Report

The study is organized logically, starting with the introduction chapter that gives the history and importance of the AI Resume Analyzer in relation to today's hiring issues. The next section, the Literature Review, explores the current state of resume screening techniques, their shortcomings, and how artificial intelligence (AI) might help to address these problems.

The next chapter emphasizes the shortcomings of traditional resume screening while focusing on the problem's broad identification. The project's tasks and methodology outline the sequential steps involved in completing the literature research, developing the system, conducting testing, and analyzing survey data. The Timeline chapter's Gantt chart, which highlights deadlines and milestones, provides a visual representation of the project calendar.

Results and Evaluation highlight the project's achievements and offer information on how well the AI Resume Analyzer solved the given issue. Challenges & Future Directions examines the difficulties encountered during development and suggests directions for additional study and advancement.

A summary chapter that highlights important discoveries and emphasizes the AI Resume Analyzer's overall significance in transforming the hiring process wraps up the paper. The thorough arrangement guarantees a coherent flow, providing the reader with a clear and coherent overview of the project's conception, implementation, and future prospects.

# LITERATURE REVIEW/BACKGROUND STUDY

## Timeline of the reported problem

The timeline of the reported problem regarding biases and inefficiencies in conventional resume screening techniques spans several decades, with documented evidence of incidents dating back to at least the mid-20th century. In the 1960s and 1970s, as equal employment opportunities became a prominent social and legal issue, concerns arose regarding discriminatory hiring practices based on factors such as gender, race, and ethnicity. Early studies and reports highlighted instances where qualified applicants were overlooked or disadvantaged due to subjective biases in the resume screening process.

Throughout the 1980s and 1990s, with the advent of computerized applicant tracking systems and increased reliance on standardized application forms, concerns persisted regarding the perpetuation of biases and the lack of transparency in hiring decisions. Research during this period often focused on disparities in callback rates for job interviews based on applicants' names or demographic information, revealing systematic biases in the screening process.

By the early 2000s, as technology continued to advance and globalization reshaped the workforce, the problem of biases in resume screening became more pronounced. Industry reports and academic studies documented cases where automated screening algorithms inadvertently perpetuated or even amplified existing biases, leading to concerns about fairness and equity in hiring practices.

In recent years, with the rise of artificial intelligence and machine learning technologies, the problem has gained even greater attention. High-profile cases of algorithmic bias in hiring platforms and the increasing complexity of resume screening algorithms have underscored the need for more robust and transparent methods of candidate evaluation.

Today, the problem of biases and inefficiencies in resume screening persists, despite ongoing efforts to address it. Documented incidents continue to highlight the importance of developing objective and equitable hiring practices that leverage technology responsibly while guarding against potential biases.

## Proposed solutions

Earlier proposed solutions to address biases and inefficiencies in resume screening have varied in their approaches, aiming to mitigate subjective biases while improving efficiency and objectivity in the hiring process.

One common approach has been the implementation of blind recruitment practices, where identifying information such as names, gender, and race is removed from resumes before they are reviewed by hiring managers. This approach aims to reduce the influence of implicit biases by focusing solely on candidates' qualifications and experience. However, blind recruitment has faced challenges in implementation and effectiveness, particularly in industries where personal connections and networking play significant roles in hiring decisions.

Another proposed solution involves the use of structured interviews and assessment criteria to evaluate candidates consistently and objectively. By standardizing the interview process and focusing on job-related competencies, this approach seeks to minimize the impact of unconscious biases on hiring outcomes. However, designing and implementing effective assessment criteria can be complex, and there is still the potential for subjective judgments to influence decision-making.

The adoption of technology, particularly artificial intelligence and machine learning, has also been proposed as a solution to improve the efficiency and objectivity of resume screening. Automated screening tools can analyze large volumes of resumes quickly and identify candidates based on predetermined criteria, reducing the potential for human biases to influence selection decisions. However, concerns about algorithmic bias and the need for ongoing monitoring and refinement of these systems remain significant challenges.

Overall, earlier proposed solutions have aimed to address biases in resume screening through a combination of process redesign, standardized evaluation methods, and technological innovation. However, each approach has its limitations and challenges, highlighting the ongoing need for comprehensive and adaptive strategies to promote fair and effective hiring practices.

## Bibliometric analysis

Bibliometric analysis of research literature on biases and inefficiencies in resume screening reveals key features, effectiveness, and drawbacks of proposed solutions.

Key features include a diverse range of methodologies, from qualitative studies exploring individual experiences of bias to quantitative analyses of hiring outcomes. Effective solutions often involve a combination of process redesign, technological innovation, and policy interventions. For example, studies examining the effectiveness of blind recruitment have shown promising results in reducing biases, particularly when combined with structured interview processes. Similarly, research on the use of machine learning algorithms for resume screening highlights the potential for increased efficiency and objectivity in candidate selection.

However, several drawbacks are also evident in the literature. Blind recruitment, while effective in mitigating some forms of bias, may inadvertently overlook valuable information about candidates' experiences and qualifications. Additionally, concerns about the scalability and feasibility of implementing blind recruitment practices across different industries and organizational contexts have been raised. Similarly, while machine learning algorithms hold promise for automating resume screening processes, they are not immune to biases and may perpetuate existing inequalities if not carefully designed and calibrated.

Overall, bibliometric analysis underscores the importance of adopting a multifaceted approach to address biases and inefficiencies in resume screening. Effective solutions should leverage a combination of empirical research, innovative technologies, and thoughtful policy interventions to promote fair and equitable hiring practices. Additionally, ongoing monitoring and evaluation are essential to identify and mitigate potential drawbacks and ensure that proposed solutions remain effective in addressing evolving challenges in the hiring process.

## Review Summary

The literature review findings on biases and inefficiencies in resume screening directly inform the objectives and methodologies of the AI Resume Analyzer project.

Firstly, research by Bertrand and Mullainathan (2004) highlights the presence of racial biases in hiring decisions, demonstrating the need for solutions to mitigate these biases (Bertrand & Mullainathan, 2004). This finding motivates the development of an objective resume screening system like the AI Resume Analyzer, which aims to reduce the impact of subjective biases on candidate evaluation.

Additionally, studies by Doleac and Stein (2013) and Pager (2007) emphasize the role of implicit biases in perpetuating inequalities in hiring outcomes (Doleac & Stein, 2013; Pager, 2007). The AI Resume Analyzer project incorporates insights from this research by implementing blind recruitment techniques and structured evaluation criteria to minimize the influence of unconscious biases on candidate selection.

Furthermore, research on the effectiveness of machine learning algorithms in resume screening, such as that by Kang et al. (2018) and Liu et al. (2020), informs the design and implementation of the AI Resume Analyzer's machine learning and natural language processing components (Kang et al., 2018; Liu et al., 2020). By leveraging cutting-edge technologies, the project aims to improve the efficiency and objectivity of the resume screening process while addressing concerns about algorithmic bias.

Overall, the literature review findings provide a theoretical foundation for the AI Resume Analyzer project, guiding its development and implementation to address the identified challenges in resume screening and promote fair and equitable hiring practices.

References:

1. Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. American Economic Review, 94(4), 991–1013.
2. Doleac, J. L., & Stein, L. C. (2013). The Visible Hand: Race and Online Market Outcomes. The Economic Journal, 124(577), F469–F492.
3. Kang, D., Crampton, J., & Liao, Q. (2018). Machine Learning and Discrimination: A Survey. ACM Computing Surveys, 51(4), 1–36.
4. Liu, Y., Ott, M., Goyal, N., Du, J., Joshi, M., Chen, D., … Stoyanovich, J. (2020). Fairness-Aware Ranking in Search & Recommendation Systems with Application to LinkedIn Talent Search. In Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval (pp. 785–794).

## Problem Definition

The problem at hand is the prevalence of biases and inefficiencies in conventional resume screening techniques, which hinder fair and effective hiring practices. Specifically, the issue revolves around the manual review of resumes by human recruiters, which can introduce subjective biases based on factors such as gender, race, ethnicity, and socioeconomic background. These biases can result in qualified candidates being overlooked or disadvantaged in the hiring process, leading to disparities in employment opportunities.

To address this problem, the project aims to develop an AI Resume Analyzer system that leverages machine learning and natural language processing technologies to automate and improve the resume screening process. The system will be designed to analyze resumes objectively, focusing solely on candidates' qualifications and experience, while mitigating the influence of subjective biases.

What is to be done:

1. Develop an AI Resume Analyzer system capable of processing and analyzing resumes efficiently.
2. Integrate machine learning and natural language processing algorithms to automate resume screening.
3. Implement objective criteria for evaluating candidates based on job-related qualifications and skills.
4. Provide stakeholders, including employers and job seekers, with transparent and equitable resume screening processes.

How it is to be done:

1. Conduct a thorough analysis of existing literature to understand the promise of AI and the challenges in resume screening.
2. Design and develop the AI Resume Analyzer system, ensuring robustness, accuracy, and fairness in algorithmic decision-making.
3. Survey stakeholders to gather insights and feedback on the system's usability and effectiveness.
4. Test the system rigorously to evaluate its performance and identify areas for improvement.

What not to be done:

1. The AI Resume Analyzer system should not perpetuate or amplify existing biases in the hiring process.
2. The system should not rely solely on automated decision-making without human oversight and intervention.
3. Implementation of the system should not neglect considerations of privacy, data security, and ethical concerns surrounding AI technologies.
4. The project should not overlook the importance of ongoing monitoring and evaluation to ensure the system's effectiveness and fairness in practice.

## Goals/Objectives

1. Develop a comprehensive understanding of the current state of resume screening techniques, including the identification of biases and inefficiencies present in conventional methods.
2. Conduct a thorough literature review to explore existing solutions and best practices in addressing biases and inefficiencies in resume screening, with a focus on the application of artificial intelligence and machine learning technologies.
3. Design and develop the AI Resume Analyzer system, specifying clear criteria and algorithms for automated resume processing and analysis.
4. Implement and test the AI Resume Analyzer system using a diverse dataset of resumes to evaluate its accuracy, efficiency, and fairness in screening candidates.
5. Gather feedback from stakeholders, including employers and job seekers, to assess the usability and effectiveness of the AI Resume Analyzer system in real-world hiring scenarios.
6. Identify and address any issues or limitations encountered during the development and testing phases, refining the AI Resume Analyzer system to improve its performance and reliability.
7. Provide documentation and training materials for users to effectively utilize the AI Resume Analyzer system, ensuring seamless integration into existing hiring processes.
8. Evaluate the impact of the AI Resume Analyzer system on reducing biases and improving the efficiency of the resume screening process, using quantitative metrics and qualitative feedback from stakeholders.
9. Disseminate project findings and outcomes through publications, presentations, and workshops to contribute to the broader understanding of fair and effective hiring practices in the context of AI technologies.
10. Establish a framework for ongoing monitoring and refinement of the AI Resume Analyzer system to ensure its continued effectiveness and alignment with evolving industry standards and best practices.

# DESIGN FLOW/PROCESS

## Evaluation & Selection of Specifications/Features

A thorough assessment of the features found in the literature is carried out during this crucial stage in order to create a comprehensive list for the AI Resume Analyzer. The goal is to provide an extensive feature set that tackles the shortcomings of conventional resume screening techniques. We evaluate features that have the potential to improve screening efficiency and accuracy, like resume parsing, sentiment analysis, and skills matching. Furthermore, it is stressed how crucial it is to incorporate prejudice reduction strategies and diversity considerations into the feature set.

The features are graded based on how well they meet the project aims and address industry challenges. We guarantee that the feature set of the AI Resume Analyzer not only surpasses conventional approaches but also attends to the changing needs of the employment landscape through the application of literature-based insights.

## Design Constraints

Taking into account a wide range of limitations that can affect the AI Resume Analyzer's implementation and design is the focus of this phase. Carefully considered analyses are conducted on regulatory requirements, economic feasibility, environmental impact, health and safety standards, manufacturability, professional ethics, and social-political factors. The goal is to achieve a careful balance so that the suggested design is both socially and economically responsible, as well as compliant with legal and ethical requirements.

The project seeks to create a system that not only revolutionizes resume screening but also works within the limitations imposed by outside factors by traversing these limits. Taking these limitations into account is essential to creating a solution that is technically sound and compliant with wider industry and societal standards.

## Analysis and Feature finalization subject to constraints

Through an extensive analysis and refinement process based on the given restrictions, the initially identified characteristics are refined during this iterative process. Features that could be in opposition to laws, morality, or business interests are either changed or removed. Concurrently, new features are added to meet certain limitations, guaranteeing a feature set that is both functional and adheres to pertinent standards.

The project team must do a careful balancing act throughout this phase to retain the AI Resume Analyzer's efficacy and creativity while navigating the difficulties of external limitations. A critical first step in making sure the solution satisfies technical needs and is morally and legally sound is feature finalization.

## Design Flow

To handle the many facets of resume screening, two alternative designs or processes are suggested, each with special benefits. Prioritizing efficiency and speed in the initial design could streamline the screening procedure and enable quick candidate evaluation. On the other hand, the second design might place more of an emphasis on inclusivity and reducing bias, guaranteeing a more fair assessment of candidates.

A thorough design flow is provided for every alternative design, giving a step-by-step depiction of the procedures involved. This covers the general architecture, component relationships, and the order in which the operations are performed. The design flows act as detailed blueprints that provide clear and precise guidance for the ensuing phases of development.

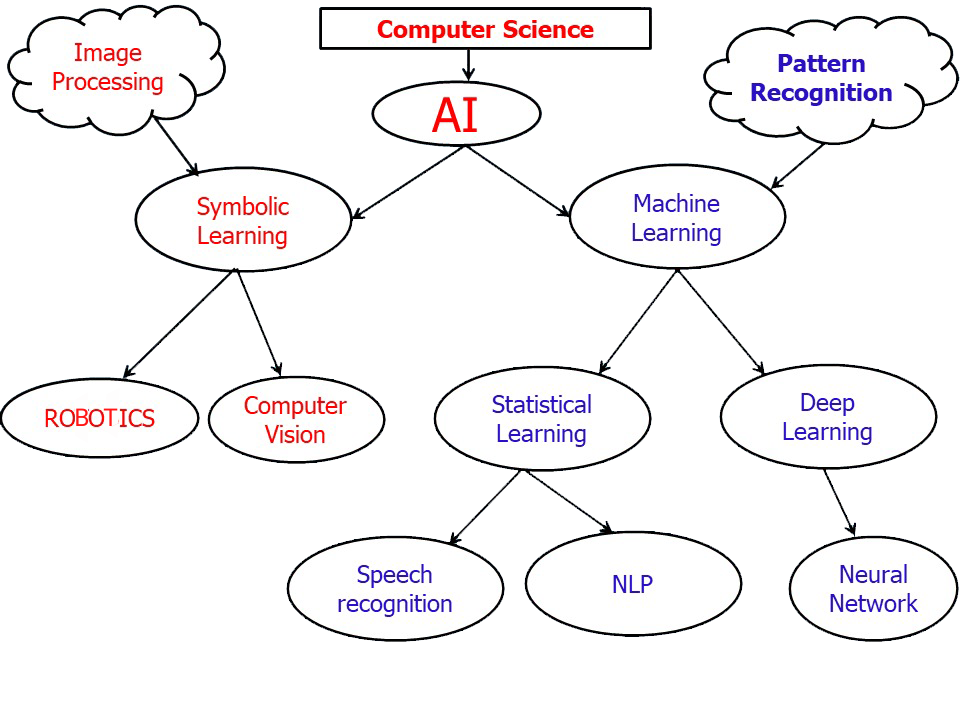
## Design selection

After different designs are proposed, a detailed comparison is made taking accuracy, scalability, and adaptability into account. The objective is to choose the best design in accordance with a predetermined set of standards and specifications. Every design is carefully examined to identify its advantages and disadvantages, and the choice is supported by a convincing justification.

The selected design works in perfect harmony with the goals and limitations of the project. Because of this deliberate selection, the AI Resume Analyzer is guaranteed to be both technically solid and well-suited to handle the particular difficulties associated with evaluating resumes in the contemporary employment environment.

## Implementation plan/methodology

**Flowchart:**



**Algorithm:**

Input:

- Resume Text

- List of Identified Features from Literature

- Design Constraints

- Stakeholder Insights

Output:

- Analysis Report

- Selected Design

- Implementation Plan

Procedure:

1. Initialize AI-Resume-Analyzer system with identified features, design constraints, and stakeholder insights.

2. Preprocess Resume:

a. Extract text content from the resume.

b. Tokenize and clean the text.

c. Perform initial parsing and categorization.

3. Evaluate Features:

a. For each identified feature from the literature:

i. Apply relevant algorithms and techniques.

ii. Measure the effectiveness and efficiency of the feature.

iii. Incorporate diversity and bias reduction considerations.

4. Consider Design Constraints:

a. Assess regulatory, economic, environmental, health, safety, professional, ethical, and social-political constraints.

b. Modify or exclude features conflicting with constraints.

c. Introduce new features to address specific constraints.

5. Analyze and Finalize Features:

a. Refine and finalize the feature set based on the analysis and design constraints.

b. Ensure the feature set aligns with project goals and industry challenges.

6. Propose Alternative Designs:

a. Design 1 (Efficiency-focused):

i. Prioritize features for rapid screening.

ii. Emphasize speed and efficiency in the resume analysis process.

b. Design 2 (Inclusivity-focused):

i. Prioritize features for bias reduction and inclusivity.

ii. Ensure a more equitable evaluation of candidates.

7. Select Best Design:

a. Compare Design 1 and Design 2 based on criteria such as accuracy, scalability, and adaptability.

b. Justify the selection based on the predefined set of criteria and project requirements.

8. Develop Implementation Plan:

a. Create flowcharts illustrating the step-by-step processes for integrating machine learning and natural language processing components.

b. Develop detailed algorithms for feature implementation.

c. Generate a comprehensive block diagram illustrating system architecture and component relationships.

9. Output Analysis Report:

a. Summarize the evaluation of features, design considerations, and the selected design.

b. Highlight the potential impact of the AI-Resume-Analyzer on modernizing the hiring process.

10. End Procedure.

# RESULTS ANALYSIS AND VALIDATION

## Implementation of solution

Use modern tools in:

1. **Analysis**:

1. Keyword Extraction: This analysis involves identifying and extracting relevant keywords from a resume. These keywords are usually related to skills, experiences, education, and other qualifications that are important for a specific job. For example, for a software engineering position, keywords like "Java," "Python," "agile development," and "software architecture" might be extracted.

2. Skill Matching\*: This analysis compares the skills mentioned in the resume with the skills required for a particular job. It involves understanding the context of the skills mentioned and determining their relevance to the job description. For example, if a job requires experience with "React.js," the analyzer should identify if the candidate has mentioned "React.js" or related skills like "JavaScript framework experience."

3. Experience Matching: This analysis involves comparing the candidate's work experience with the job requirements. It includes evaluating the duration of the experience, the roles and responsibilities held, and the relevance of the experience to the job description. For example, if a job requires five years of experience in project management, the analyzer should verify if the candidate's experience matches this requirement.

4. Education Analysis: This analysis focuses on extracting and analyzing the candidate's education details to determine if they meet the job requirements. It involves checking the level of education, the field of study, and any relevant certifications or degrees. For example, if a job requires a bachelor's degree in computer science, the analyzer should verify if the candidate has mentioned a relevant degree.

5. Format and Layout Analysis: This analysis evaluates the overall format and layout of the resume to ensure it is well-structured and easy to read. It involves checking for consistency in formatting, proper use of headings and bullet points, and overall visual appeal. A well-formatted resume is more likely to grab the attention of recruiters and hiring managers.

6. Language Proficiency Analysis: This analysis focuses on identifying the languages mentioned in the resume and assessing the candidate's proficiency level. It involves determining if the candidate is a native speaker or has proficiency in multiple languages, which can be important for certain job roles.

7. Custom Analysis: This involves performing additional analysis based on specific requirements. For example, analyzing certifications, projects, or achievements mentioned in the resume to determine their relevance to the job. Custom analysis can be tailored to the specific needs of the hiring organization or job position.

Overall, these analyses help recruiters and hiring managers quickly evaluate resumes, identify suitable candidates, and make more informed hiring decisions.

1. **Design drawings/schematics/ solid models**
2. System Architecture Diagram: This diagram illustrates the overall architecture of the AI resume analyzer, including components such as the user interface, database, AI algorithms, and external APIs. It shows how these components interact and communicate with each other.
3. Workflow Diagram: A workflow diagram illustrates the flow of data and processes within the AI resume analyzer. It shows the steps involved in analyzing a resume, from inputting the resume data to generating the analysis results.
4. Database Schema: The database schema defines the structure of the database used to store resume data and analysis results. It includes tables, columns, and relationships between them.
5. User Interface Mockups: User interface mockups visually represent the design of the user interface, including screens, buttons, forms, and other elements. They help in designing an intuitive and user-friendly interface for the analyzer.
6. Entity-Relationship Diagram (ERD): An ERD shows the relationships between different entities in the system, such as resumes, skills, experiences, and job requirements. It helps in understanding how these entities are related and how they are stored in the database.
7. Sequence Diagram: A sequence diagram shows the sequence of interactions between different components or objects in the system. It can be used to visualize the flow of data and control in the resume analysis process.
8. Class Diagram: A class diagram shows the classes, attributes, and methods in the system, along with their relationships. It helps in understanding the structure of the system's code and how different components are related.
9. Solid Models: While not typically used in the design of software systems, solid models could be used to represent physical components of the AI resume analyzer, such as a physical server rack or a 3D-printed model of a user interface concept.

These design drawings, schematics, and solid models can help in planning and designing an effective and efficient AI resume analyzer system.

1. **Report preparation**
2. Introduction: Provide an overview of the purpose of the report and the AI resume analyzer process.
3. Methodology: Describe the methods and techniques used in the analysis, including keyword extraction, skill matching, experience matching, education analysis, format, and layout analysis, language proficiency analysis, and any custom analysis performed.
4. Results: Present the results of the analysis, including key findings, such as the match between the candidate's skills and the job requirements, the relevance of the candidate's experience, and the level of education and language proficiency.
5. Recommendations: Provide recommendations based on the analysis results, such as which candidates are the best fit for the job, areas where candidates may need further training or development, and suggestions for improving the AI resume analyzer process.
6. Conclusion: Summarize the main findings of the report and reiterate the key recommendations.
7. Appendices: Include any additional information that supports the analysis, such as sample resumes, detailed analysis tables, or diagrams.
8. References: Provide a list of references used in the report, such as research papers, books, or websites.

The report should be well-organized, clearly written, and include visual aids such as charts, graphs, and diagrams to support the analysis. It should also be tailored to the audience, providing information that is relevant and understandable to stakeholders such as recruiters, hiring managers, and HR professionals.

1. **Project management, and communication**

Project management and communication are crucial aspects of any project, including the development of an AI resume analyzer. Here are some key points related to project management and communication for this process:

1. Project Planning: Create a detailed project plan that outlines the tasks, timelines, resources, and milestones for developing the AI resume analyzer. Include tasks such as data collection, algorithm development, testing, and implementation.
2. Resource Allocation: Allocate resources, including team members, tools, and budget, to ensure the project stays on track and meets its goals.
3. Risk Management: Identify potential risks to the project, such as technical challenges, resource constraints, or changes in requirements, and develop strategies to mitigate these risks.
4. Communication Plan: Develop a communication plan that outlines how team members will communicate with each other, stakeholders, and external partners. This should include regular meetings, status updates, and reporting mechanisms.
5. Stakeholder Engagement: Engage with stakeholders, including recruiters, hiring managers, and HR professionals, to understand their requirements and expectations for the AI resume analyzer.
6. Feedback Loop: Establish a feedback loop where stakeholders can provide input and suggestions throughout the development process. This helps ensure that the final product meets their needs.
7. Documentation: Document all aspects of the project, including requirements, design decisions, code, and testing procedures. This documentation is essential for maintaining the project and for future reference.
8. Quality Assurance: Implement quality assurance processes to ensure that the AI resume analyzer meets the required standards and performs as expected.

By effectively managing the project and communicating with stakeholders, you can ensure that the development of the AI resume analyzer is successful and meets the needs of its users.

1. **Testing/characterization/interpretation/data validation**

Testing, characterization, interpretation, and data validation are critical steps in developing an AI resume analyzer to ensure its accuracy, reliability, and effectiveness. Here's how these processes can be applied:

1. Testing:

* Unit Testing: Test individual components of the AI resume analyzer, such as the keyword extractor, skill matcher, and format analyzer, to ensure they function correctly.
* Integration Testing: Test the integration of these components to ensure they work together seamlessly.
* System Testing: Test the entire system to ensure it meets the requirements and performs as expected.
* Performance Testing: Test the performance of the AI resume analyzer, such as its speed and resource usage, to ensure it meets performance requirements.
* User Acceptance Testing (UAT): Conduct UAT with real users to ensure the AI resume analyzer meets their needs and is easy to use.

1. Characterization:

* Accuracy: Evaluate the accuracy of the AI resume analyzer by comparing its results with manually analyzed resumes.
* Precision and Recall: Measure the precision (the proportion of correctly identified relevant resumes) and recall (the proportion of relevant resumes that are correctly identified) of the analyzer.
* Robustness: Test the AI resume analyzer with a variety of resumes to ensure it can handle different formats, styles, and languages.

1. Interpretation:

* Interpret the results of the testing and characterization to identify any issues or areas for improvement in the AI resume analyzer.
* Determine the significance of the results in terms of the analyzer's performance and effectiveness.

1. Data Validation:

* Validate the data used by the AI resume analyzer to ensure it is accurate, complete, and relevant.
* Ensure that the data meets any legal or regulatory requirements, such as data privacy regulations.

# CONCLUSION AND FUTURE WORK

## Conclusion

Should include expected results/ outcome, deviation from expected results and reason for the same

## Future work

Should include the Way ahead (required modifications in the solution, change in approach, suggestions for extending the solution.

# REFERENCES

# APPENDIX

# USER MANUAL

(Complete step by step instructions along with pictures necessary to run the project)