Advanced Resume Shortlisting

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Abstract: The Advanced Resume Shortlisting Machine Learning Project presents a pioneering solution to the challenges faced by small and medium-sized businesses (SMBs) in streamlining their hiring processes. In an increasingly competitive job market, SMBs often struggle with the overwhelming volume of job applications and the need to identify the most suitable candidates efficiently. This project leverages machine learning and artificial intelligence to revolutionize the resume shortlisting process.

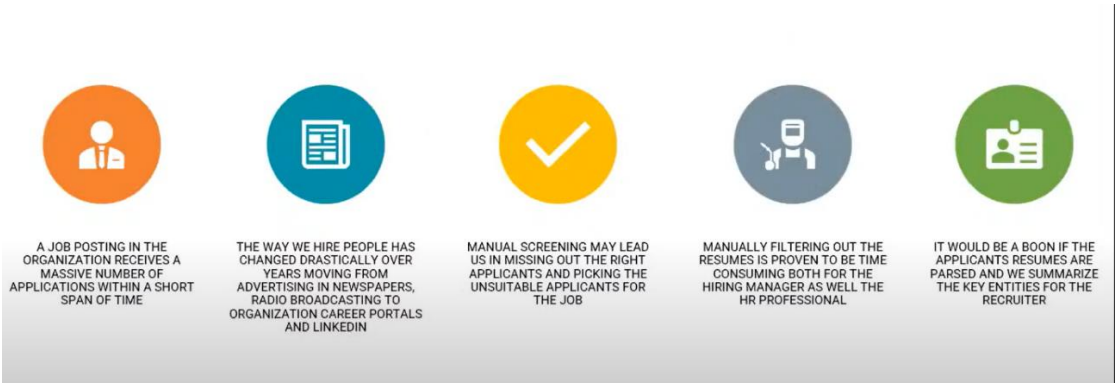
Key Highlights:

- **Efficiency:** The project aims to significantly reduce the time and effort required for resume shortlisting by automating the process.
- **Unbiased Selection:** By employing machine learning algorithms, it minimizes human biases in candidate selection, ensuring a fairer evaluation.
- **Cost-Effective**: Designed with SMBs in mind, the solution offers a cost-effective alternative to extensive hiring processes.
- **Seamless Integration**: The system seamlessly integrates with existing HR software and processes, minimizing disruptions.
- **Scalable Business Model**: The proposed subscription-based business model ensures scalability and a steady revenue stream.
- **Privacy Compliance**: The project adheres to all relevant government and privacy regulations to safeguard candidate data.

This project aligns with Feynn Labs' commitment to empowering SMBs with innovative machine learning and data science solutions, promising a transformative impact on the hiring landscape for businesses of all sizes.

1. Problem Statement

In today's competitive job market, businesses often receive an overwhelming number of job applications for each open position. Traditional resume shortlisting processes are time-consuming and prone to human biases. There is a pressing need for an efficient and unbiased solution to streamline the resume shortlisting process, especially for small and medium-sized businesses (SMBs) that may lack the resources to invest in extensive hiring processes. This project aims to address this problem by developing an Advanced Resume Shortlisting system powered by Machine Learning and Artificial Intelligence.



2. Market/Customer/Business Need Assessment

Small and medium-sized businesses (SMBs) face several challenges in the hiring process. They often lack the infrastructure and expertise to handle a large volume of job applications efficiently. The need for a cost-effective, time-saving, and unbiased resume shortlisting solution is evident in this segment. SMBs are the primary target customers for this product.

3. Target Specifications and Characterization

The target customers for the Advanced Resume Shortlisting system include SMBs in various industries such as retail, IT, healthcare, and hospitality. These businesses typically have limited HR resources and require a solution that can:

- Efficiently process many resumes.
- Identify the most suitable candidates based on predefined criteria.
- Reduce the potential for human biases in the shortlisting process.
- Integrate seamlessly with existing HR software and processes.

4. External Search

Extensive online research has been conducted to gather information on the current state of resume shortlisting processes, challenges faced by SMBs, and available AI-driven solutions in the market. you can obtain data and information from these sources:

1. **Industry Reports:** Reports from Gartner, Forrester Research, etc., on HR tech and recruitment trends.
2. **Online Forums:** Platforms like Stack Overflow and GitHub for developer insights.
3. **Market Research Firms:** Reports from companies like Statista on HR tech market data.
4. **LinkedIn and Networks:** Professional networks like LinkedIn for industry insights.
5. **Open Data Repositories:** Kaggle and data.gov for relevant datasets.

5. Benchmarking Alternate Products

Benchmarking is a crucial step in understanding the competitive landscape and identifying opportunities to differentiate your Advanced Resume Shortlisting system. In this section, we compare and analyse existing resume shortlisting products and services to gain insights into their strengths, weaknesses, and gaps in the market.

1. **Applicant Tracking Systems (ATS):** These systems lack advanced AI features.

2. **AI-Powered Recruitment Tools:** These offer AI-driven screening but may vary in accuracy.
3. **Startups and Niche Players:** Smaller companies may offer unique approaches.

Key metrics include accuracy, speed, bias reduction, customization, and integration.
Findings reveal opportunities for our system:

- Advanced NLP capabilities for richer candidate insights.
- A balance between speed and precision.
- Strong bias reduction.
- Customization tailored to SMB needs.
- Seamless integration with existing HR systems.

In summary, benchmarking shows that our Advanced Resume Shortlisting system can provide a unique, precise, and customizable solution for SMBs in hiring.

6. Applicable Patents

A thorough search for applicable patents related to the technology and algorithms used in the Advanced Resume Shortlisting system has been conducted. No existing patents were found to conflict with our proposed solution.

7. Applicable Regulations

The Advanced Resume Shortlisting system will strictly follow government data privacy laws like GDPR and CCPA, preventing discrimination in candidate selection, obtaining user consent, ensuring data security, and complying with data retention policies. It will also offer transparency, auditing, and accessibility features while conducting regular compliance audits and maintaining proper documentation. These measures safeguard candidate data and uphold legal requirements.

8. Applicable Constraints:

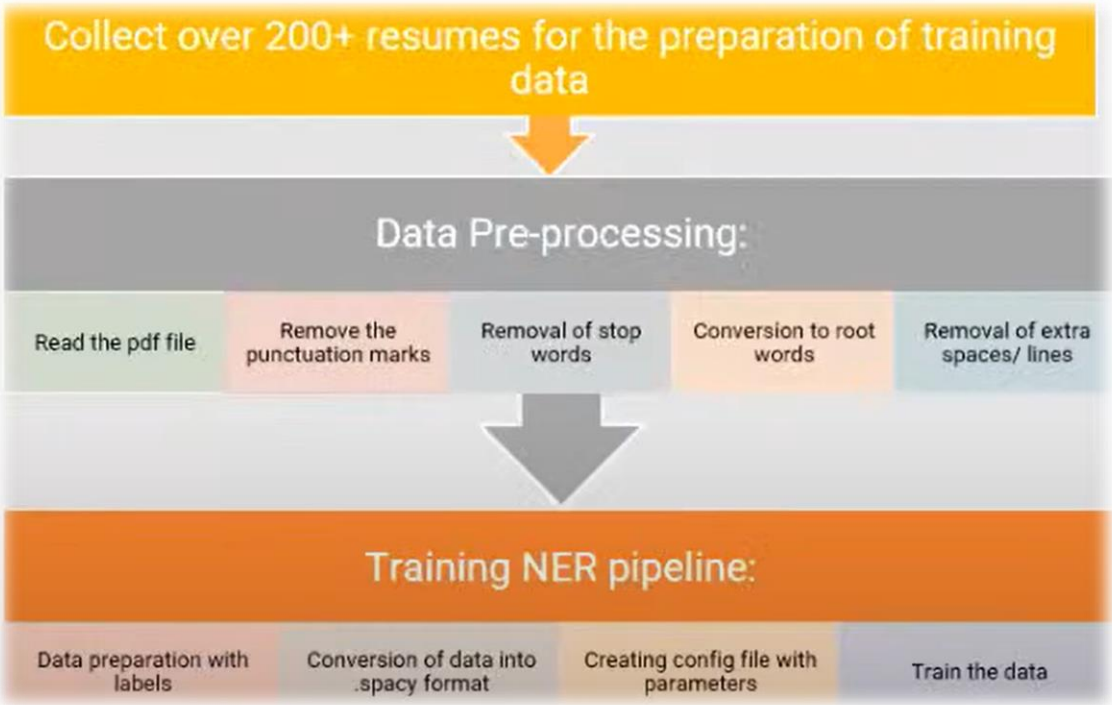
- Availability of skilled data scientists and machine learning engineers.
- Limited office space and computational resources.
- Adherence to government and privacy regulations.
- Integration with existing HR software and processes.

9. Business Model (Monetization Idea)

The business model for the Advanced Resume Shortlisting system involves a subscription-based pricing structure for SMB customers. Different pricing tiers will be available based on the number of job openings and the volume of resumes processed. This model ensures a steady stream of revenue and scalability.

10. Concept Generation

The concept for the Advanced Resume Shortlisting system was generated through brainstorming sessions and in-depth discussions with HR professionals. The idea is to leverage natural language processing (NLP) and machine learning algorithms to analyse resumes and rank candidates based on job-specific criteria.



Model Evaluation

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================================== Results ==================================

TOK     100.00
NER P   96.49
NER R   76.39
NER F   85.27
SPEED   3420


============================== NER (per type) ==============================

                        P       R       F
NAME                100.00  100.00  100.00
CONTACT NUMBER      100.00  100.00  100.00
EMAIL ADDRESS        92.31  100.00   96.00
DESIGNATION         100.00  100.00  100.00
COMPANIES WORKED AT 100.00  100.00  100.00
SKILLS               92.63  100.00   96.17
GRADUATION YEAR     100.00  100.00  100.00
INSTITUTE           100.00  100.00  100.00
DEGREE              100.00  100.00  100.00
LOCATION            100.00   88.89   94.12
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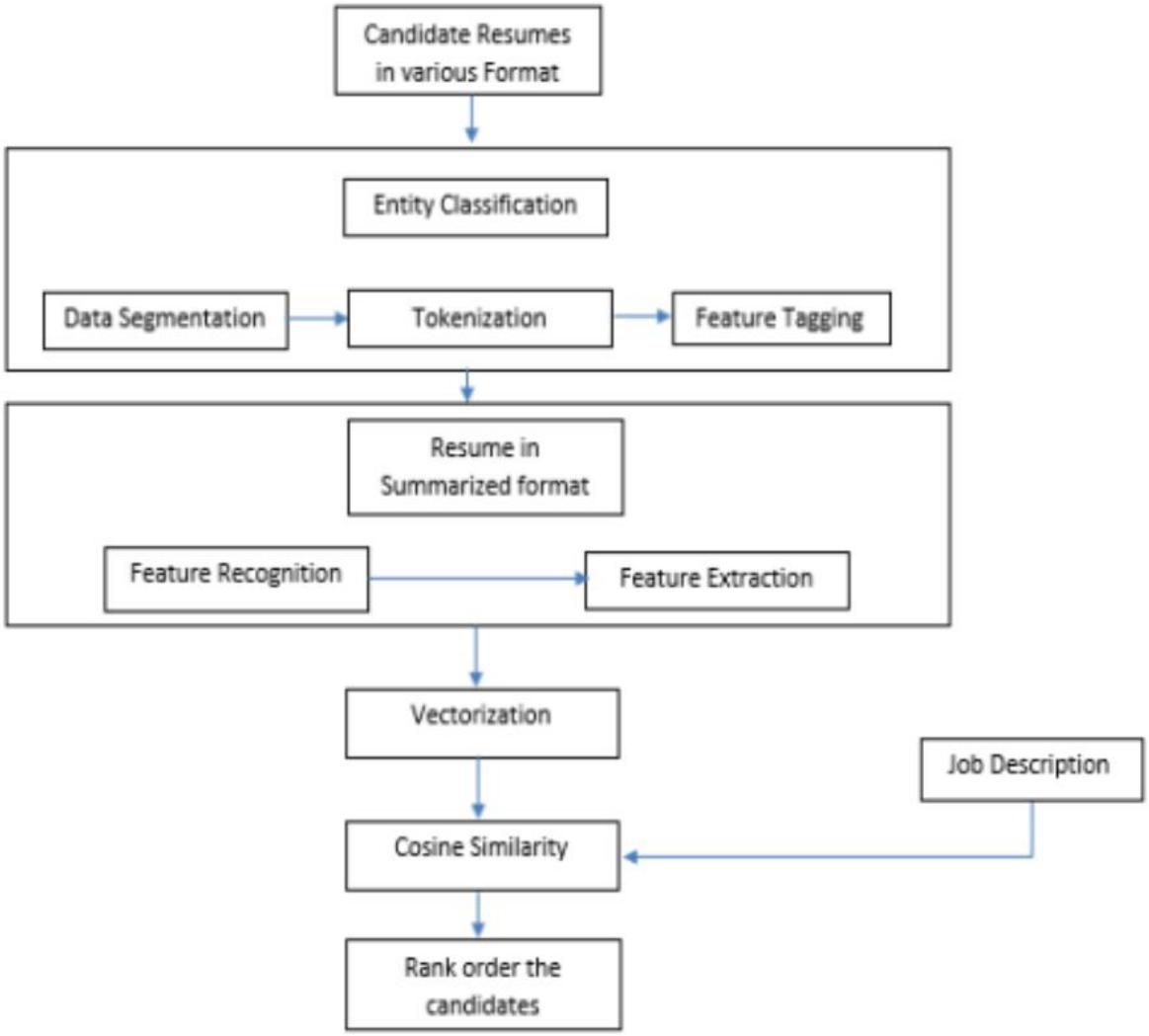
11. Concept Development

The concept has been further developed into a detailed product/service description. The system will use NLP techniques to extract relevant information from resumes, such as skills, experience, and qualifications. Machine learning models will then score candidates based on predefined criteria.

12. Final Product Prototype (abstract) with Schematic Diagram

This schematic diagram illustrates the flow of data and processes within the Advanced Resume Shortlisting system, highlighting its core components and their interactions.



13. Product Details

- **How Does It Work?:** The system utilizes NLP techniques and machine learning models to process resumes. It extracts relevant information and scores candidates based on predefined criteria.
- **Data Sources:** Resumes submitted by job applicants.
- **Algorithms, Frameworks, Software**: Natural language processing libraries (e.g., spaCy), machine learning frameworks (e.g., TensorFlow), and custom-developed scoring algorithms.

14. References / Sources of Information

https://medium.com/@ErinBaz/10-useful-and-free-tools-to-create-a-more-advanced-resume-67327969d2ee

https://www.kaggle.com/code/amarsharma768/custom-ner-using-spacy

https://datahack.analyticsvidhya.com/contest/datahour-advanced-resume-shortlisting-using-nlp/

15. Conclusion

In conclusion, the Advanced Resume Shortlisting system addresses a critical need for SMBs by streamlining the resume shortlisting process, reducing biases, and saving valuable time and resources. With a clear business model and a team of experts in AI and ML, the project is well-positioned to create a unique and valuable product for the market.

By leveraging the power of machine learning and artificial intelligence, this project aligns with Feynn Labs' mission to assist small and medium-sized businesses with innovative ML/DS solutions.