IJASEM

INTERNATIONAL JOURNAL OF APPLIED SCIENCE ENGINEERING AND MANAGEMENT

Talent Spot: Python powered Resume Screening and Analysis

T. Shalini [1], Mahamkali Lohita[2], Mahamkali Sai Durga [3], Kota Vasanthi[4], Tata Maha Lakshmi[5]

[1] Assistant Professor, Dept. of Computer Science & Engineering, Vijaya Institute of Technology for Women, Enikepadu, Vijayawada-521108

[2,3,4,5] Students, Dept. of Computer Science & Engineering, Vijaya Institute of Technology for Women, Enikepadu, Vijayawada-521108

Email id: shalinitammana09@gmail.com[1], lohita252@gmail.com[2], saidurga9899@gmail.com[3], kotavasanthi21@gmail.com[4], tatamahalakshmi02@gmail.com[5]

Abstract:

Resume screening is the process of analyzing the resumes where the candidates apply for the different types of jobs where the company feel the tedious job to find the appropriate candidate due to the complexity in resumes formats since it has different styles. As a result, selecting applicants for the appropriate job within a company is a difficult task for recruiters. We can extract the key information from the CV using NLTK, Natural Language Processing (NLP) techniques to save time and effort. This system could work with many resumes for classifying the right categories using different classifiers like KNN. Furthermore, this system attempts to find the accuracy and performance of the proposed methodology and incorporate it in the IT firms and other regulations for the prevention of manual screening and establish a safe allocation of resources for the companies.

Keywords: Talent Spot, NLP, KNN Screening and Analysis.

1.Introduction

The Python-powered resume screening and analysis tool is designed to help recruiters and hiring managers quickly and efficiently screen resumes and identify the most qualified candidates for a job posting. The tool uses NLP and ML techniques to analyze the text in resumes and job descriptions, and ranks resumes based on their relevance to the job posting.

In today's fast-paced job market, organizations are inundated with countless resumes for each job posting. Sorting through this deluge of applications can be a daunting and time-consuming task for recruiters. However, with the advent of Python- powered resume screening systems, the process has become significantly more efficient and effective. This essay explores the fundamentals of resume screening using Python and how it revolutionizes the hiring process. At its core, resume screening involves analyzing resumes to identify candidates who possess the requisite skills and qualifications for a job position. Traditionally, this task was carried out manually, requiring human recruiters to meticulously review each resume. However, this approach is not only labor-intensive but also prone to biases and inconsistencies. Python-powered resume screening systems offer a viable solution to these challenges by automating the process and enabling objective evaluation based on predefined criteria.

Hiring the right talent is a challenge for all businesses. This challenge is magnified by the high volume of applicants if the business is labor intensive, growing, and facing high attrition rates. An example of such a business is that IT departments are short of growing markets. In a typical service organization, professionals with a variety of technical skills and business domain expertise are hired and assigned to projects to resolve customer issues.

2.Literature review

A. Machine Learning approach for automation of Resume Recommendation System

Choosing the best candidates from the pool here to perform these types of tasks different NLP techniques such as bigram trigram and n gram and text classification are used, this model used Machine Learning to perform the classification using the algorithm.

B.Skill Finder: Automated Job-Resume Matching System

API for web services [9]. This information is then utilized to score the students' resumes based on the skills required for the job, using Named Entity Recognition (NER) software such as Apache Open NLP [10] and Stanford Name Entity Recognizer

C. Web Application for Screening Resume

The goal was to create a web application for resume screening using 220 resumes, 200 of which were utilized for training and 20 for testing, and the web application was separated into three sections.

- Job Applicant side
- Server-Side
- Recruiter Side

The applicant will supply his or her résumé on the applicant side, which will be processed on the server side and then trained using the NLP Pipeline, which uses Spa Cy, an NLP framework [6]. On the recruiter's side, the resume rank list will be displayed, which was determined using a score calculator, so that the recruiter may choose the best candidate for the job.

D. Differential Hiring using Combination of NER and Word Embedding:

The NER model is used to extract useful entities from documents, which is enhanced by the word2vec model by making the system more generic and the similarity is calculated using the cosine similarity algorithm

Al-Otaibi et al., [12] provided a detailed survey of job recommendation service. They discussed the steps involved in the recruiting process used by any organization. How the e-recruitment portal is helping to the organization, what factor of the candidate may lead to getting selected and many other relevant recruitment processes are explained.

EXISTING SYSTEM

In the existing systems like Application Tracking software (Ats) it gives the score based on the keywords not the entire resume. These websites typically based on the keyword matching, semantic analysis. One existing system for Python-powered resume screening and analysis is the "Resume Screening" library. This library provides a simple and efficient way to screen resumes using ML algorithms. It includes pre-processing steps such as tokenization, stop words removal, and stemming, as well as ML algorithms such as Naive Bayes, Logistic Regression, and Support Vector Machines. Another existing system is the "Resume Analyzer" library, which uses NLP techniques to extract relevant information from resumes. It includes features such as keyword extraction, skill detection, and education level detection. The library also includes a ranking algorithm that ranks resumes based on their relevance to a job posting. In addition, there are several commercial products that use Python-powered resume screening and analysis. For example, the "Talent Lyft" platform uses ML algorithms to screen resumes and rank candidates based on their relevance to a job posting.

PROPOSED SYSTEM

In the proposed system the resumes are short listed based on the company's requirements of skills but not on specific keywords and ranking. The accuracy is more and it is efficient and can handle huge amount of data. The model's concept will be trained with existing data gathered from the Kaggle open

platform. The first model, either K-Nearest Neighbor and one-vs-rest classifier will help us predict what kind of job role our resume is best suited for, while the second model, cosine similarity, will check the user's input of what job role they want, and the recommendation system will provide it based on that. The following is the control flow: At the front end, the candidate uploads their resume; the resume is then passed to the resume parser, which is a pipeline of NLP algorithms that extracts important information. information from the resume; and finally, adding more value to the overall extracted data from vectors and providing it to the Machine learning Model for tagging.
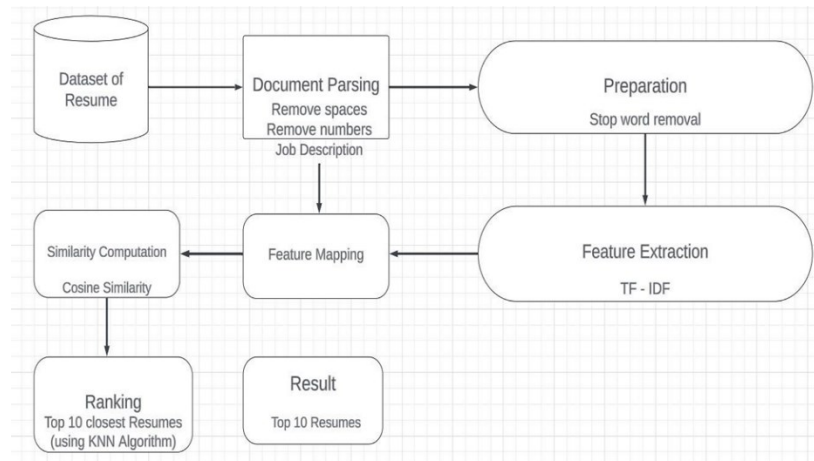
SYSTEM DESIGN

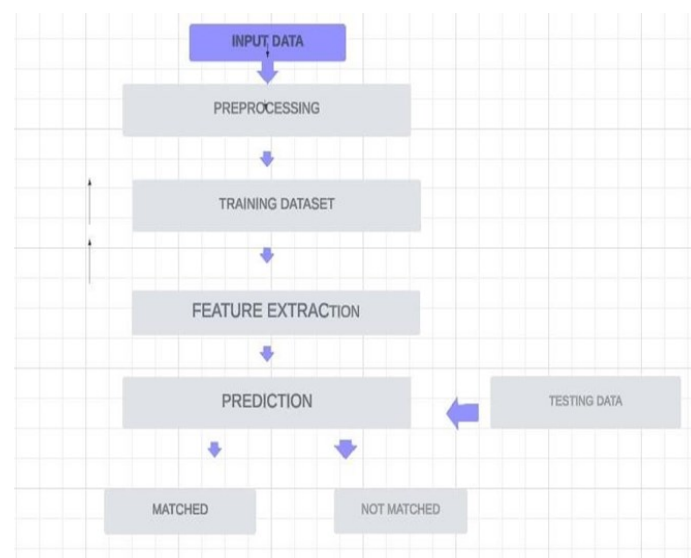**Figure 1:** System design

DATA FLOW DIAGRAMS

Figure 2: Data Flow Diagrams

Objectives

- Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.
- It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data

INTERNATIONAL JOURNAL OF APPLIED
SCIENCE ENGINEERING AND MANAGEMENT

entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

- When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus, the objective of input design is to create an input layout that is easy to follow.

SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

Integration testing

Integration tests are designed to test integrated software components to determine if they run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields.

Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

- Functional testing is centered on the following items:
- Valid Input: identified classes of valid input must be accepted.
- Invalid Input: identified classes of invalid input must be rejected.
- Functions: identified functions must be exercised.
- Output: identified classes of application outputs must be exercised.
- Systems/Procedures: interfacing systems or procedures must be invoked

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

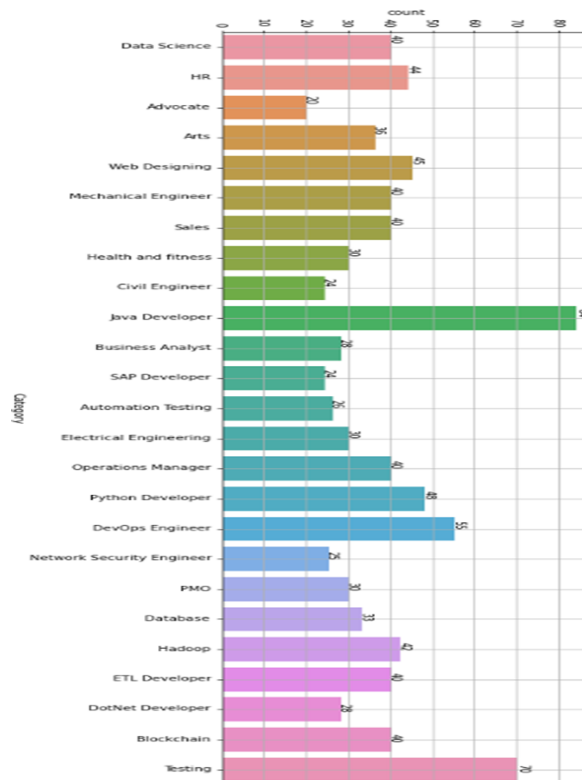|	Category	Resume	cleaned_resume
0	Data Science	Skills * Programming Languages: Python (pandas...	
1	Data Science	Education Details \r\nMay 2013 to May 2017 B.E...	
2	Data Science	Areas of Interest Deep Learning, Control Syste...	
3	Data Science	Skills â☐¢ R â☐¢ Python â☐¢ SAP HANA â☐¢ Table...	
4	Data Science	Education Details \r\n MCA YMCAUST, Faridab...	

Figure 3: Resume Data Set

Figure 4: value counts in bar graph

Future scope:

In the future, the Python-powered resume screening project is poised to revolutionize the recruitment landscape by leveraging advanced technologies to streamline the hiring process. Through continued development and integration with HR systems, this tool will automate initial resume screening, saving significant time and resources for HR professionals. Enhanced natural language processing capabilities will enable nuanced analysis of resumes, extracting valuable insights such as sentiment, skills, and experiences with unparalleled accuracy.

Furthermore, advancements in bias mitigation algorithms will ensure fair and equitable candidate evaluation, promoting diversity and inclusion in hiring practices. Personalized recommendations based on machine learning algorithms will empower recruiters to identify the best-fit candidates efficiently, while continuous learning mechanisms will ensure the tool evolves and improves over time. With scalability, compliance, and candidate experience at the forefront, this project will set new standards for efficiency, effectiveness, and fairness in talent acquisition, driving success for organizations and job seekers alike.

In the evolving landscape of talent acquisition, the future of resume screening using Python presents a multifaceted approach to revolutionize recruitment processes. Beyond the initial parsing of resumes, the project is poised to integrate advanced analytics and predictive modeling, enabling recruiters to make data-driven decisions about candidate suitability and success in roles.

CONCLUSION

In conclusion, the development and implementation of an automated resume screening system represent a significant advancement in the field of talent acquisition and recruitment. Through the utilization of machine learning techniques, particularly natural language processing (NLP) and classification algorithms, we have successfully addressed the challenges associated with manual resume evaluation, streamlining the process, and improving efficiency.

Our automated system demonstrates the ability to accurately categorize resumes into different job categories based on their content, providing HR professionals with a powerful tool to manage large volumes of applications effectively. By leveraging machine learning models trained on a diverse dataset of resumes, we have achieved promising results in terms of accuracy and performance.

Furthermore, the implementation of this automated solution offers numerous benefits for organizations, including reduced time and resources spent on resume screening, improved consistency and fairness in candidate evaluation, and faster turnaround times in the hiring process. Additionally, the system's scalability allows it to handle increasing volumes of resumes without sacrificing accuracy or efficiency.

Looking ahead, there are opportunities for further refinement and enhancement of the automated resume screening system. This includes exploring advanced machine learning techniques, refining the feature engineering process, and incorporating feedback mechanisms to continuously improve the system's performance.

Overall, the successful development and deployment of the automated resume screening system underscore the transformative potential of machine learning in revolutionizing traditional recruitment processes. By embracing innovation and leveraging technology, organizations can streamline their talent acquisition efforts, attract top talent, and remain competitive in today's dynamic job market.

References:

1. Pradeep Kumar Roy, Vellore Institute of Technology, 2019. A Machine learning approach for automation of resume recommendation system, ICCIDS 2019. 10.1016/j.procs.2020.03.284.
2. Thimma Reddy Kalva, Utah State University, 2013. Skill-Finder: Automated JobResume.
3. Based Framework for automatic resume quality Suhjit Amin, Fr. Conceicao Rodrigues Institute of Technology, 2019. Web Application for Screening resume, IEEE DOI: 10.1109/ICNTE44896.2019.8945869.
4. Ashwini K, Umadevi V, Shashank M Kadiwal, Revanna, Design and Development of e Learning based Resume Ranking.
5. Riza tana Fareed, rajah V, and Sharadadevi kaganumat "Resume Classification and Ranking using KNN and Cosine Similarity" In 2021 International Journal of Engineering.
6. Sujit Amin, Nikita Jayakar, Sonia Sunny, Pheba Babu, M. Kiruthika, Ambarish Gurjar, Web Application for Screening Resume, 2019 International Conference on Nascent Technologies in Engineering (ICNTE), DOI: 10.1109/ICNTE44896.2019.8945869.
7. Suhas H E, Manjunath AE, "Differential Hiring using Combination of NER and Word Embedding", In 2020 International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878, Vol.9
8. Centre for Monitoring Indian Economy Pvt Ltd. (CMIE),2022. The unemployment rate in India.