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RESUME RANKING SYSTEM USING MACHINE LEARNING &NLP

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Abstract: Selecting desirable applicants for an organization is one of the major challenges in human resource management. Through e-recruitment, candidates can now be represented on the web under a wider range of possibilities. This manual screening process may hinder the team's efforts to find the right candidate at the right time. The difficult screening process may be significantly streamlined by using an automated system for screening and ranking applicants. To accommodate the identified intelligence in hiring patterns, machine learning would be applied to understand the intelligence behind them. Using ML (Machine Learning) to rank the resumes with the given job requirements to match the best comparable candidates which is the most important and crucial task for any company to hire an ideal candidate for their job role. To classify resumes based on their respective categories, NLP (Natural Language Processing) and Machine Learning (ML) are used, while MaLSTM model(Siamese networks + LSTM with Manhattan distance) is used to rank candidates based on their resume's similarity to the job description.

I. INTRODUCTION

In the IT business, evaluating resumes is an important step for finding new candidates with the required skills. Thousands of resumes are review by HR team. People come from different fields of profession and have different backgrounds. Each one of them has had different types of education, has worked on different projects and thus has a unique style of presenting his/her credentials in the resume. Resumes are unstructured documents that come in various file formats (.pdf, .doc, .docx, .jpg, .txt etc.) and their content is not written according to standard formats or templates. This means reading resumes is not simple and thus recruiters spend a large amount of time going through the resumes for selecting the right candidates. These resumes will be automatically processed by the information extraction system. Extracted information such as name, phone/contact details, emails id's, qualification, experience, skill-sets etc. can be stored as a structured data in a DB and then can be used in various different areas/fields.

This project enables recruiters to sort through a sea of resumes to locate the best applicants who fulfil the job requirements (particularly during high-volume recruiting). Applications are filtered based on qualifications for open positions, including experience, education, and skills. the end result of scoring each CV based on an intelligent comparison to the relevant Job Description. The project automates the process using machine learning and natural language processing technique.

II. MOTIVATION

The current recruitment process is more difficult and time consuming which forces the candidates to fill all their skill and information manually. And HR team requires more man power to analyse the resumes of the candidates. The motivation behind implementing resume ranking systems in the recruitment process stems from the need to enhance efficiency, improve candidate screening, and increase the accuracy of matching job requirements with candidate skills. Here are some key motivations for using resume ranking systems:

- **Efficiency**: When hiring for a job opening, an employer may receive hundreds or even thousands of resumes. It can be time-consuming and tedious to manually review each one. By using NLP and ML algorithms

to rank resumes based on their relevance to the job opening, employers can significantly reduce the time and effort required to identify the most qualified candidates.

- **Improved candidate experience**: A resume ranking system can also benefit job seekers by providing a more personalized experience. By analyzing the content of a candidate's resume, the system can recommend relevant job openings and provide feedback on how to improve the resume to increase its chances of being selected.
- **Better matches:** By using NLP and ML algorithms to analyze both job postings and resumes, a ranking system can identify the most relevant candidates for a particular job opening. This can result in better matches between employers and job seekers, increasing the likelihood of a successful hire.

III. LITERATURE SURVEY

Professor Dr.K.Satheesh and , A.Jahnavi proposed a system using advanced Natural Language Processing which is a field in Machine Learning.Model helps the recruiters in screening the resumes based on job description with in no time. It makes the hiring process easy and efficient by extracting the required entities automatically by using Spacy NER model.

Professor Ashif Mohamed proposed a system using Ontology where we can compare the resume models with the given job requirements to match the best comparable candidates. Two ranking algorithms are underlined in this system which will be invoked to assign a ranking point to the recommended candidates against the other candidates on the recommendation pool.

Professor Sayed Zainul Abideen Mohd Sadiq and Juneja Afzal Ayub Designed an automated system to extract information from unstructured resumes and transform that information to structured format. And ranking those resumes based on the information extracted, according to the skill sets of the candidate and based on the job description of the company.

Professor **S. Singh** and **A. Pratap Singh** proposed a system using natural language processing (NLP) based approach for resume screening and ranking, utilizing keyword extraction and matching, named entity recognition, and sentiment analysis techniques. The proposed system achieves high accuracy in matching resumes to job requirements and provides useful insights for improving resume quality.

Resume Ranker: A Hybrid Approach for Ranking Resumes" by Sumit More, Sumit Lohokare, and Raghavendra Deshmukh (2018):

- This work presents ResumeRanker, a hybrid resume ranking system that combines NLP, machine learning, and rule-based techniques.
- The authors are affiliated with the College of Engineering, Pune, India.
- Resumes are preprocessed using NLP techniques, and features like keyword frequency and semantic similarity are extracted.

IV. SUMMARY

A resume ranking system is a type of software application that evaluates and ranks job applicants' resumes based on specific criteria. These systems use a combination of natural language processing (NLP) techniques and machine learning algorithms to analyze and extract information from resumes, job descriptions, and other relevant documents. Resume ranking systems aim to reduce the time and effort involved in the manual screening process, allowing recruiters to efficiently shortlist candidates with the required skills and qualifications. The effectiveness of these systems depends on the quality of the data, features, and algorithms used. Therefore, ongoing research is focused on improving the accuracy and efficiency of these systems by incorporating more advanced techniques and incorporating more comprehensive data sets.

V. CONCLUSION

Resume ranking systems have become increasingly popular in recent years as a solution to streamline and automate the recruitment process. These systems have been developed using a combination of natural language processing techniques and machine learning algorithms that can accurately evaluate resumes, extract key information, and rank applicants based on specific criteria. By providing recruiters with a faster and more efficient way to identify the most suitable candidates, resume ranking systems can significantly reduce the time and costs involved in the recruitment process. However, there are still challenges to be addressed, such as

improving the accuracy of the system and addressing potential biases in the data. As technology continues to evolve, we can expect to see further advancements in resume ranking systems and their use in the recruitment industry.

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