Advanced Resume Evaluation Platform: Harnessing NLP for Skill Enhancement

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ABSTRACT_ The Indian recruitment market has expanded significantly over the previous half-decade, as the need for cheap labor rises and the number of job opportunities increases. And as the employment market expands, so does the recruitment industry, which is a new form of hiring individuals by outsourcing the hiring process to other companies whose primary mission is to provide the appropriate personnel for the company. This is done because these organizations are employing in large numbers, and doing so in-house would demand a significant amount of company resources, reducing productivity.
As such companies emerge, manually reviewing all of the candidate resumes is time-consuming and tedious, so these Talent Acquisition Companies use various Machine Learning models to filter out top resumes based on job roles, reducing the Human Resource team's efforts.
Using NLP (Natural Language Processing) and ML (Machine Learning) to rank resumes according to the supplied constraint, this intelligent system ranks resumes in any format according to the given constraints or the following client company demand.

We will primarily get the bulk of the input resume from the client firm, and the client company will also give the requirements and limits under which the resume should be ranked by our system. In addition to the information provided in the résumé, we will study the individual's social profiles (such as LinkedIn, GitHub, etc.), which will offer us with more actual information about that candidate.

1.INTRODUCTION

An essential step in the hiring process is the automatic review of resumes, which entails assessing job applications to find the applicant most suited for a given position. This procedure may take a long time and be prone to human mistake, which could lead to the loss of qualified individuals. Automated resume screening and analysis has grown in popularity recently as a solution to this problem. Automatic resume screening uses several methods to enhance accuracy and efficiency, including deep learning algorithms, machine learning, and natural language processing (NLP). The most qualified applicant for a position must be found through careful consideration of job applications, which is done during the Automated Evaluation of Resumes Using NLP stage of the hiring process. Automated resume analysis and screening is now a practical alternative to the manual screening procedure because to developments in natural language processing.

In this project, we examine a few contemporary methods for screening automated resumes. To increase the

precision and effectiveness of the screening process, these approaches employ a variety of methods including transfer learning, genetic algorithms, and multi-source data. Also, some research investigates the use of job descriptions to improve resume screening precision. These research experimental findings show that the suggested strategies are more effective than conventional ones. The results of this study can help human resource managers and recruiters automate the hiring process and efficiently and impartially identify viable applicants

2.LITERATURE SURVEY

2.1.1 First Generation Hiring Systems:

Methodology:

In this System the Hiring team would publish their vacancies and invite applicants. Methods of publishing were newspaper, television and mouth. The interested candidates would then apply by sending their resumes. These resumes were then received and sorted by the hiring team and shortlisted candidates were called for further rounds of interviews. The whole process would take lot of time and human efforts to find right candidate suitable for their job roles.

2.1.2 Second Generation Hiring Systems:

Methodology:

As the industries have grown, there hiring needs has rapidly grown. To serve this hiring needs certain consultancy units have come into existence. They offered a solution in which the candidate has to upload their information in a particular format and submit it to the agency. Then these agencies would search the candidates based on certain keywords. These agencies were middle level organizations between the candidate and company. These systems were not flexible as the candidate has to upload there resume in a particular format, and these formats changed from system to system.

2.2 Publication: International Journal of Advanced Research in Computer Science and Software Engineering, 2021

In 2021, the study named "Automated Resume Screening Using Natural Language Processing" got published in the International Journal of Advanced Research in Computer Science and Software Engineering. The study proposes an automated resume screening system that extracts data from resumes using NLP techniques and ranks them based on how well they match the job description.

2.3 Publication: International Journal of Advanced Research in Current Technology and Engineering, 2020

"Resume Screening using Natural Language Processing and Machine Learning" was published in the International Journal of Current Technology and Engineering in 2020. The method outlined in the study uses NLP and machine learning to screen resumes and match them to job descriptions.

3.PROPOSED SYSTEM

In this project using Resume Parser and NLP API we are parsing resume to extract details like skills, qualification and personal details and this extraction is very helpful for companies where they are not supposed to manually scan each and every resume. Once resume uploaded then based on required skills and applicant skills score will be calculated and if score is high then company will shortlist those applicants and call for interviews.

The proposed system would extract relevant features from job descriptions and resumes and map them to fixed-length vectors using S-BERT and cosine similarity . The cosine similarity and S-BERT similarity scores will be used to determine how well the job application matches the job description. The approach under consideration seeks to improve screening process accuracy, reduce biases, and ensure that only the most qualified individuals are chosen for further consideration.

3.1 IMPLEMENTATION

Modules refer to self-contained units or components of a software system that encapsulate a set of related functions, procedures, or data structures. Modules are designed to perform specific tasks or to implement specific features of the software, and they are typically organized in a modular fashion to promote code reusability, maintainability, and scalability. In this Project we are using two modules as-

- Admin module
- User module

3.1.1 Admin module:

In the Admin module, the first step is logging in with a username and password to access the admin features. Once logged in, the admin can create job postings for users based on what they're looking for. They include details like the job title, what the job involves, the name of the company offering the job, how much it pays, and the skills needed. After posting a job, the admin waits for users to apply. When users apply, the admin looks at their resumes to see if they match the job they've applied for. They choose the resumes that best match the job requirements. That's how the process works in a nutshell!

3.1.2 User module:

In the **User module**, individuals are required to register on the website before gaining access to its features. Upon successful registration, users proceed to log in to the website using their credentials. Once logged in, they gain visibility into the available job postings. Users have the option to browse through the listed job opportunities and apply for positions

that align with their interests and qualifications. This straightforward process allows users to engage with the platform efficiently, accessing and pursuing relevant job prospects with ease.

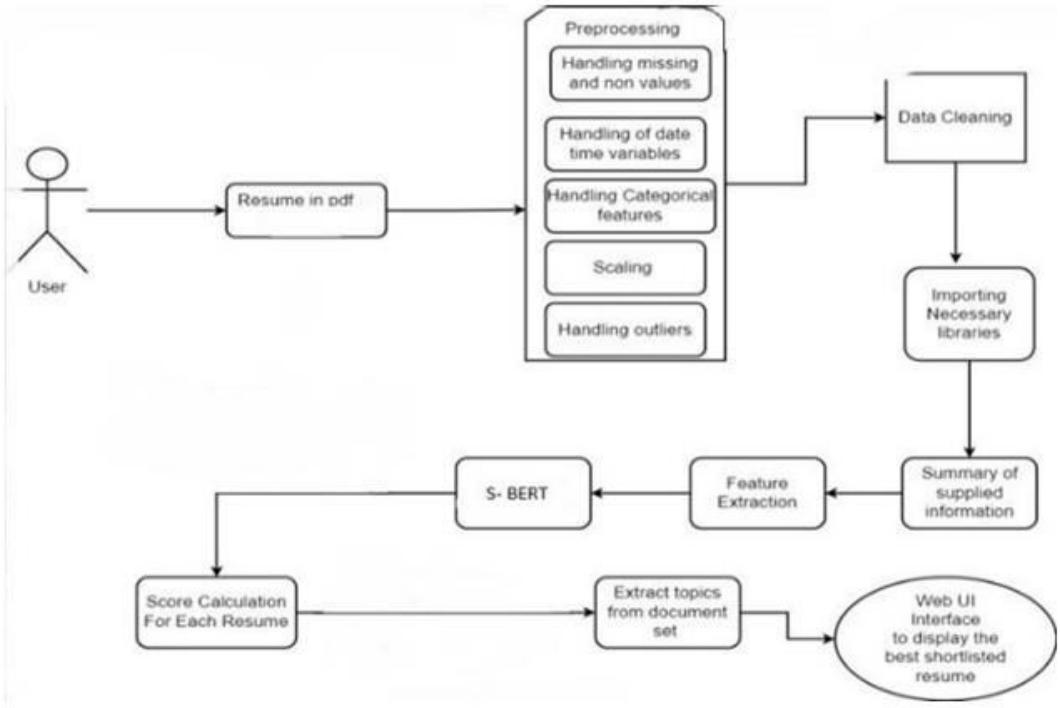
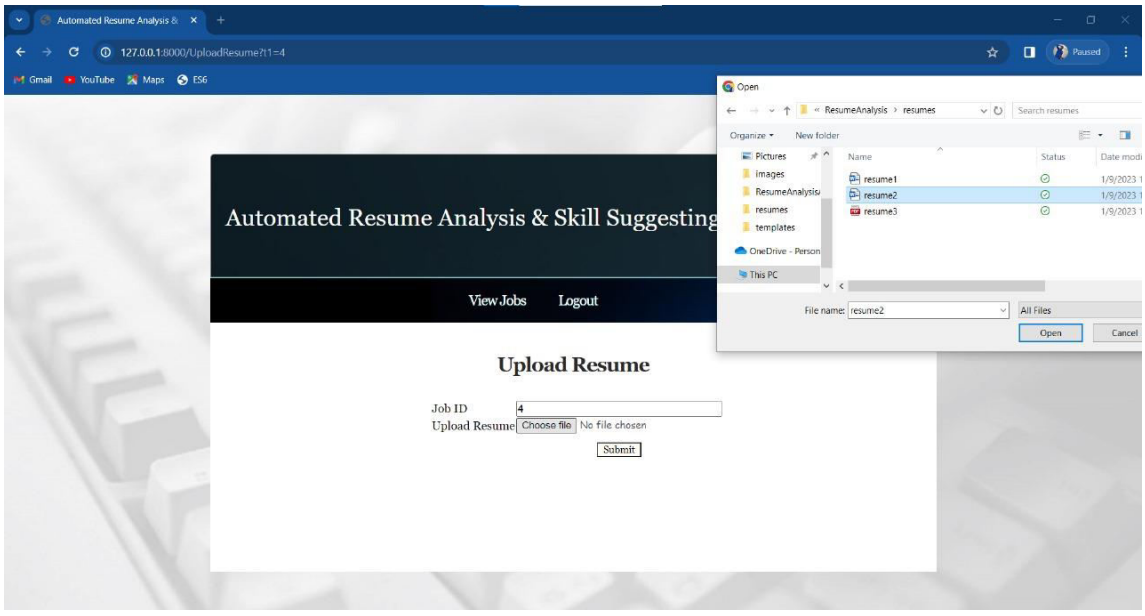
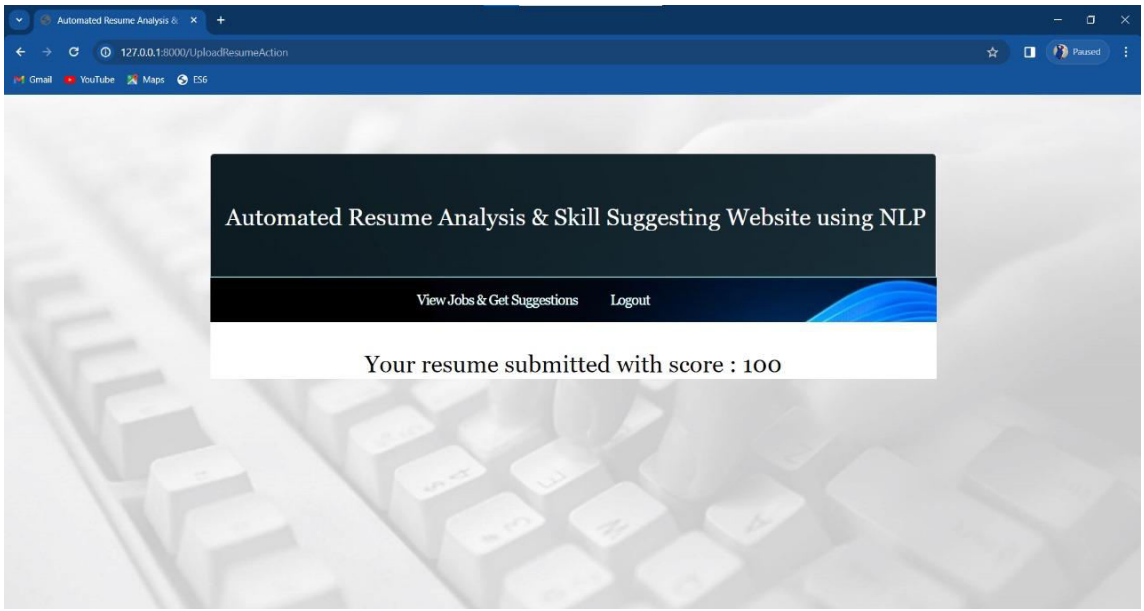


Fig 1: Process flow Diagram

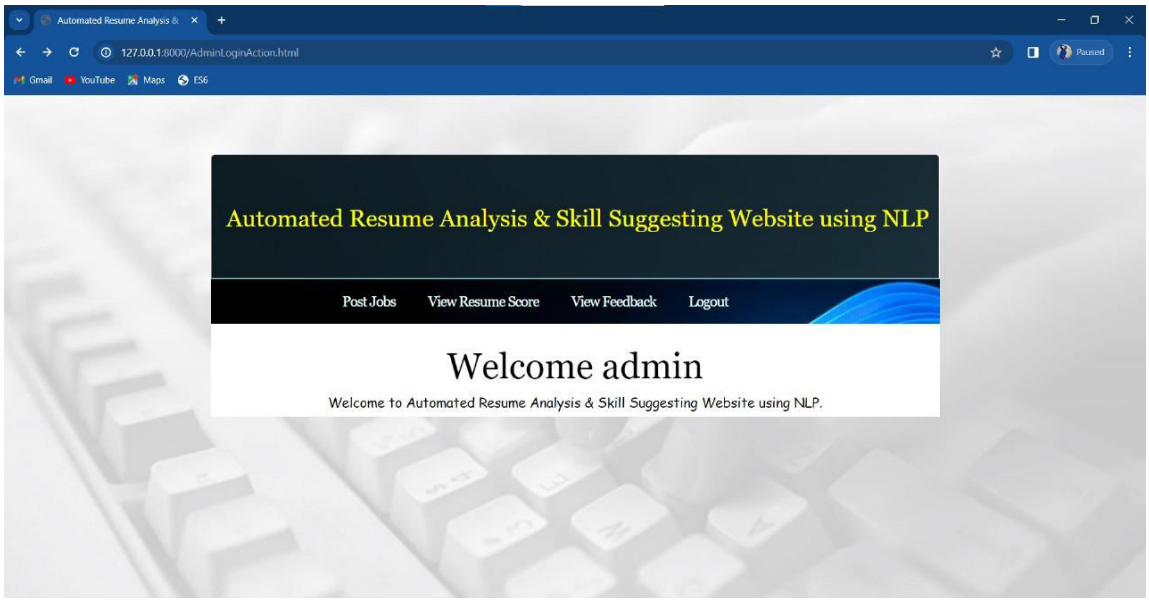
4.RESULTS AND DISCUSSION

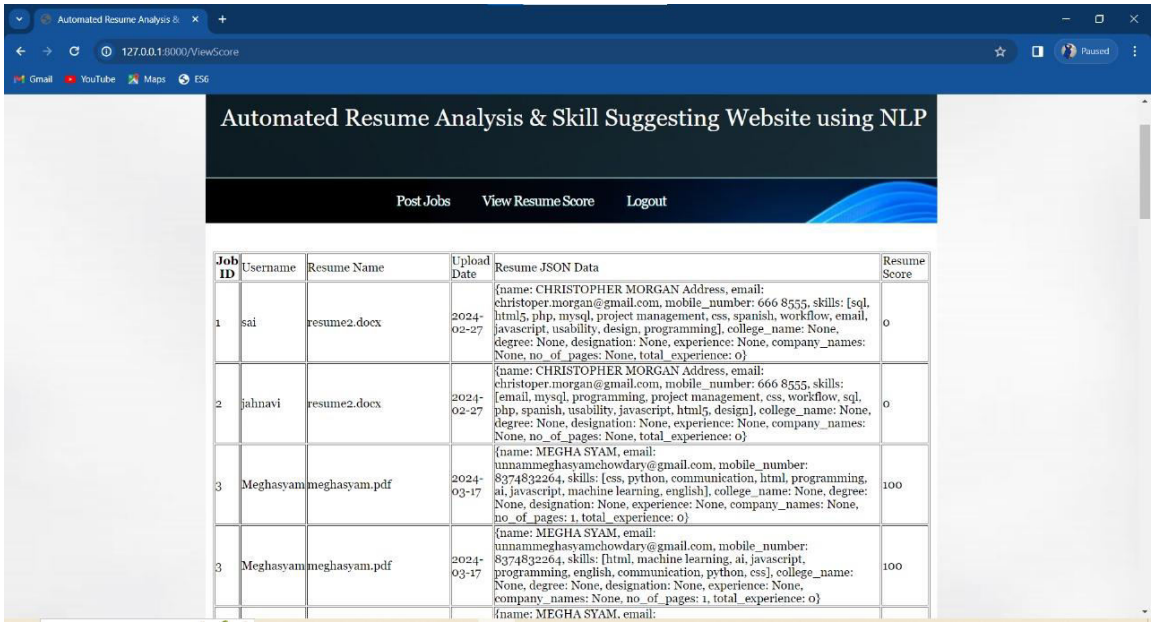


User had selected and uploaded the resume then press 'Open' and 'Submit' button to get below score value.



In the above screen in User resume got 100 score and now login as admin to view all resume details by clicking 'View Resume Score' link.





Job ID	Username	Resume Name	Upload Date	Resume JSON Data	Resume Score
1	sai	resume2.docx	2024-02-27	{name: CHRISTOPHER MORGAN Address, email: christoper.morgan@gmail.com, mobile_number: 666 8555, skills: [sql, html5, php, mysql, project management, css, spanish, workflow, email, javascript, usability, design, programming], college_name: None, degree: None, designation: None, experience: None, company_names: None, no_of_pages: None, total_experience: 0}	0
2	jahnavi	resume2.docx	2024-02-27	{name: CHRISTOPHER MORGAN Address, email: christoper.morgan@gmail.com, mobile_number: 666 8555, skills: [email, mysql, programming, project management, css, workflow, sql, php, spanish, usability, javascript, html5, design], college_name: None, degree: None, designation: None, experience: None, company_names: None, no_of_pages: None, total_experience: 0}	0
3	Meghasyam	meghasyam.pdf	2024-03-17	{name: MEGHA SYAM, email: unnammeghasyamchowdary@gmail.com, mobile_number: 8374832264, skills: [css, python, communication, html, programming, ai, javascript, machine learning, english], college_name: None, degree: None, designation: None, experience: None, company_names: None, no_of_pages: 1, total_experience: 0}	100
3	Meghasyam	meghasyam.pdf	2024-03-17	{name: MEGHA SYAM, email: unnammeghasyamchowdary@gmail.com, mobile_number: 8374832264, skills: [html, machine learning, ai, javascript, programming, english, communication, python, css], college_name: None, degree: None, designation: None, experience: None, company_names: None, no_of_pages: 1, total_experience: 0}	100
				{name: MEGHA SYAM, email:	

In the above screen Admin can view resume file name which he can read from server and he can view all resume extracted details in JSON format and in the last column he can see the score values.

Similarly, you can upload and extract details and score from resume and supported formats are only PDF and DOCX files.

5.CONCLUSION

By deriving this conclusion, we can argue that using NLP algorithms for resume screening has significant advantages over more traditional methods. These algorithms are extremely exact, efficient, and adaptable, and they can handle unstructured data like resumes written in many languages. They can also reduce prejudice and improve candidate matching, resulting in better hiring processes. It is important to recognize that these algorithms have limits and are not ideal in all situations. As a result, it is critical to use these algorithms as part of a bigger hiring strategy that involves human judgment and arbitrary standards. The use of NLP algorithms in recruiting is a promising breakthrough, with the potential to profoundly change how firms screen and select job prospects. This project investigates several ways for detecting, identifying, and classifying diverse resumes using machine learning and neural network models such as SVM, KNN, Word2Vec, Cosine similarity, and so on. The accuracy of the models varies depending on the datasets utilized, the complexity of the learning methods, and the quantity of the dataset, with values ranging from 78% to 98%. We conclude that with a proper dataset and the right technique, we can get good accuracy and desired output for a wide range of purposes.

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