

CV Analysis and Personality Prediction System for Recruitment Process Using ML

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Abstract - When studying people; determining one's personality is vital since it provides insight into the individual's thought. When working for a complex company, an individual's personality is critical. There are various methods for determining an individual's personality, but the most popular and straightforward is a short quiz. The quiz questions will be constructed so that they incorporate values from the Big Five personality model and help the developer create a personality report for the individual in question. When we examine the existing hiring and selection processes used by various firms, we can observe that employers typically select CVs manually, which is tedious, time-consuming, and requires a significant number of human resources. The purpose of this project is to create a system that, using the technology we'll construct, automates an eligibility checking and aptitude evaluation of applicants throughout the selection process. It will be feasible to overcome the shortcomings of the traditional hiring process by creating a web application that examines a candidate's CV and personality.

Keywords: CV, NLP, Machine Learning, Personality Prediction, and Big Five Personality Model (OCEAN).

1. INTRODUCTION

Personality is the most important factor that reflects an individual and keeps on varying. Tackling them is a

difficult task for which we are going to implement an approach to identify the personality and provide a recommendation.

The first step in recruitment is the job application, which consists of personal details, experience, and, most importantly, a CV. Companies typically receive thousands of applications for each job opening and employ a dedicated screening team to select qualified candidates.

It is extremely difficult for humans to manually go through each applicant's CV. Many candidates are eliminated in the first round due to ineligibility, an inadequate CV, or a lack of skill. Hiring the right candidate is a difficult task because no candidate is perfect; some may not be skilled enough, while others may not have the right personality. As a result, we are going to propose a method for streamlining and speeding up the shortlisting process through personality prediction.

Making personality predictions based on an individual's BIG FIVE TEST result is the main objective of our project. Many job searchers will submit an application for a position if the company provides detailed job requirements and details. As such, candidates for jobs first complete their online resume before appearing for the exam. In essence, the test we utilized is the BIG FIVE TEST.

2. LITERATURE REVIEW

A. Web Application for Screening Resume

This paper majorly on the design of the web application which will be used to screen resumes (Curriculum Vitae) for a particular job posting. According to the author, recruiters would undoubtedly benefit from this technique in weeding out the most qualified applicants based on resumes for further rounds of the recruiting process. It will lessen the recruiters' workload.

It was not possible to perform operations on a file in a pdf, so it must be first converted to text. It may provide inaccurate results if the data is not entered properly. ^[1]

B. Personality Prediction Via CV Analysis using Machine Learning

This research uses Natural Language Processing (NLP) techniques to investigate several machine learning approaches for effectively predicting personality through CV analysis. The Random Forest approach outperformed other algorithms including KNN, Logistic Regression, SVM, and Naive Bayes in terms of accuracy, according to the results. ^[2]

C. CV Analysis Using Machine Learning

The proposed system is meant to make it simple for recruiters and job applicants alike to apply for positions and undergo screening. The Author states that this system will enable a more effective way to shortlist submitted candidate CV from a large number of applicants providing a consistent and helps in recruitment process. To reduce the time complexity of the system, the candidate's resume will only be matched to those job openings where their skills match with the job requirements. ^[3]

D. Personality Prediction with CV Analysis

In this paper, the author's approach is rendering a system that motorizes the eligibility check and aptitude evaluation of an applicant in the selection process.

A web application that evaluates a person's personality as well as their resume has been developed to address the shortcomings of the traditional hiring method. ^[4]

E. Personality Evaluation and CV Analysis Using Machine Learning Algorithm

The system that automates a recruiting process's eligibility verification and aptitude assessment of candidates is presented in this paper. This system will identify the experience and key skills required for a particular job position. This system will help the HR department to easily shortlist the candidate based on the CV scores. The candidate's personality can also be identified with the help of this system. Separate set keys are given to candidates to take the aptitude and personality exams. ^[5]

3. Proposed System

The goal of the "CV Analysis and Personality Prediction System for Recruitment Process Using ML" project is to use personality prediction in addition to CV analysis for the recruiting process. The study of existing systems mentioned in the above literature review gives the idea of the limitations rose during making the systems. So, to overcome some of those limitations, here is the proposed system which can fulfill the requirements of the recruiters also it will help the needful candidates/aspirants.

The earlier systems had the facility of predicting personality, Analyzing CV and filtering out the most prospective candidates based on their resumes. The systems had single facility from above mentioned ones. The proposed system aims for recruiting a candidate by predicting the personality and analyzing the CV/Resume. The candidates are shortlisted by the CV scores and the aptitude test.

4. Comparative Analysis

Sr. No.	Title	Technology/ Method Used	Observations
1.	Web Application for Screening Resume	ML – Semi Supervised learning NLP - SpaCY NER (Named Entity Recognition)	Based on resumes, this system surely will assist recruiters select the most capable candidates for the next stage of the recruiting process. It will reduce the recruiters' workload. It was not possible to perform operations on a file in a pdf, so it must be first converted to text. It may provide inaccurate results if the data is not entered properly.
2.	Personality Prediction Via CV Analysis using Machine Learning	Big 5 Test (OCEAN). ML Algorithms - Logistic Regression, Naive Bayes, KNN, SVM, Random Forest NLP - SpaCY, Pyresparser, PhraseMatcher.	The system can be used by various companies in order to streamline the recruitment process by considering the personality of potential candidates by conducting an aptitude test & personality test. The results show that Random Forest has the highest accuracy of 0.71. However, the accuracy is far lower than planned due to a lack of data.
3.	CV Analysis Using Machine Learning	ML – Semi Supervised learning, KNN, Logistic Regression NLP - SpaCY NLTK NER (Named Entity Recognition)	This tool will make it possible to narrow down the many CVs supplied by candidates, making the hiring process more efficient and uniform. To reduce the time complexity of the system, the candidate's resume will only be matched to those job openings where their skills match with the job requirements.
4.	Personality Prediction of CV Analysis	ML – Logistic Regression NLP Big Five Personality Model NLTK Firebase	This system is an online application – based approach which is an unbiased system that selects a candidate accurately. This system also analyses the personality of the candidates, recruiters can hire individuals on the basis of their overall temperament as well on the requirements of the hiring committee. To improve the accuracy of the model, more aptitude tests can be added on-site, which can also increase the efficiency of the system.

5. System Design

5.1. Block Diagram:

A block diagram is a system design in which the main components or functions are represented by blocks connected by lines that represent the blocks' relationships. Block diagrams are frequently used in higher-level, less technical descriptions that aim to clarify overall concepts without delving into implementation specifics.

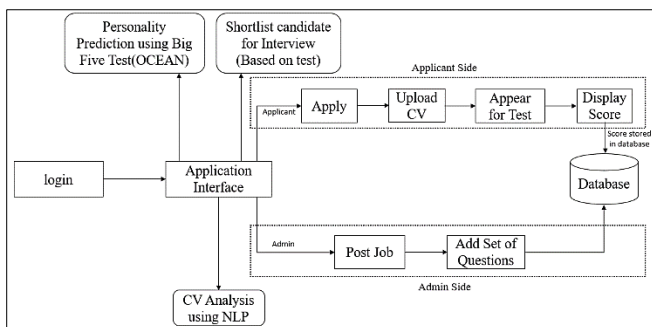


Fig. 5.1.: Block Diagram

5.2. Project Modules:

The proposed system of CV Analysis and Personality Prediction for recruitment process consists of three main modules. The modules are: 1. Personality Prediction (Based on Big Five Personality test using OCEAN based values) 2. CV Analysis (Using NLP and Random Forest Algorithm) 3. Shortlisting of the candidate (Based on the result of both the tests and the CV Score).

1. Personality Prediction

A person's personality is important in both organizational advancement and self-development in the course of their life. This technique can predict personality based on a quiz. The quiz questions will be developed so that they incorporate values from the Big Five personality model. The Big Five Personality Test, also known as the OCEAN Model.

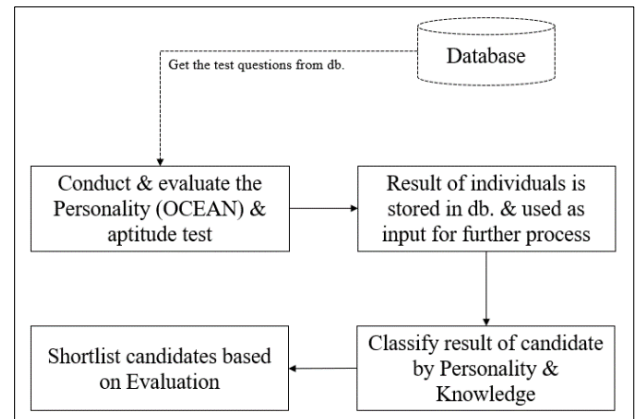


Fig.: 5.2.1. Personality Prediction Module

2. CV Analysis

CV (Curriculum Vitae) is an important part of job recruitment process. In this system, the admin would allow the applicants to upload their CV and apply for job. The CV's submitted by the applicants are compared to the job profile requirements stated by the recruiters. These requirements would be the Skills, Experience, Certifications, etc.

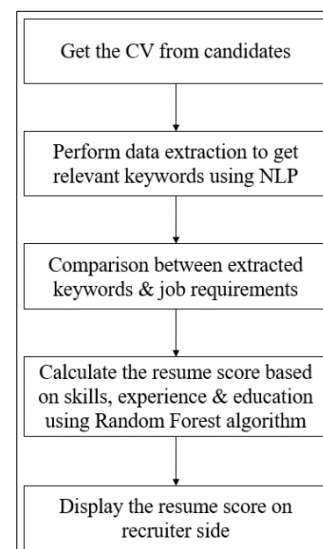


Fig. 5.2.2.: CV Analysis Module

3. Shortlisting Candidate

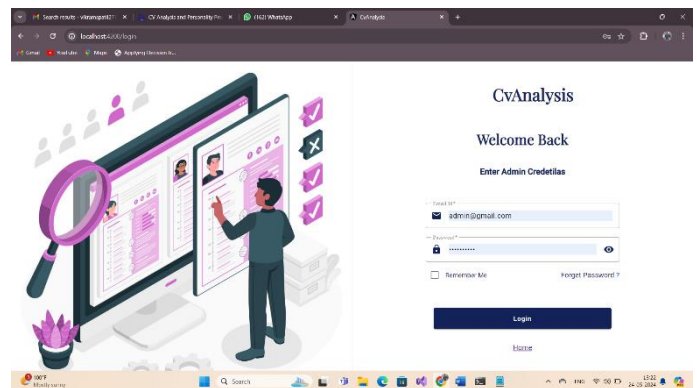
In this system, shortlisting of candidates will be done on the basis of Personality Prediction Test and by analyzing their CV's. Also, there will be a test just like an Aptitude Test on the basis of which the final shortlisting would be done.

There are Six sub modules in this project

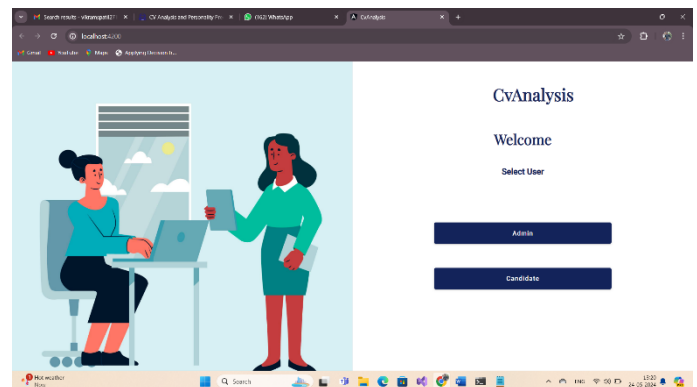
- Module 1 - Job Opening:
 - Admin will be opening in which he will add detailed job description with skills, and can mark it as publish.
 - Admin can see for which opening how much candidates are applied and the ranking of each candidate.
 - Admin can see resume of the candidate.
- Module 2 - Candidate Job Application:
 - Candidate will register via otp with our website, receives welcome email.
 - Candidate search for the opening which he wants to apply.
- Module 3 - Resume (CV) analysis:
 - Candidates can upload a resume.
 - Resume will be stored to blob storage.
 - ML model will analyze the resume and create the tokens of resume.
- Module 4 - Personality Test portal:
 - Personality test portal.
 - Candidate can give personality test.
- Module 5 - Candidate Aptitude test:
 - Candidate have to give aptitude test which is directly managed at opening creation time.
 - Camera proctoring will be there for monitoring.
 - He can submit the test and the test will be stored at backend.
- Module 6 - Result and Ranking:
 - Admin can see the result of candidate on opening dashboard.
 - Admin can arrange the candidates based on result.

6. Result (Snapshots)

6.1. Main Screen



6.2. Admin Login



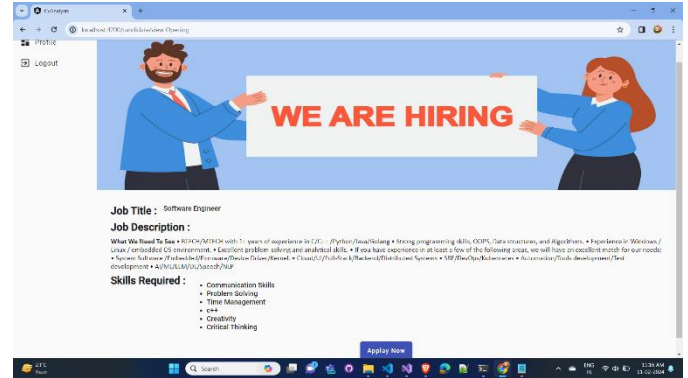
6.3. Job Opening (Admin Side)

Opening List			
<div> <div>Opening List</div> <div>Candidates</div> <div>Logout</div> </div> <div> <input type="text" value="Search Opening Name"/> <input type="button" value="Add Opening"/> </div>			
Sl. No.	OPENING NAME	STATUS	ACTIONS
1	Software Engineer	Publish	👁
2	Associate HR Shared Service	Publish	👁
3	Software Developer	Publish	👁
4	Technical Operations Engineer	Publish	👁
5	Developer	New	✎ 🗑 📧
6	Payroll Clerk	Publish	👁

6.4. Activity Dashboard (Admin Side)

Candidate List							
Opening List		Candidates					
Candidates		Sort By: Matching Percentage					
Logout		Search Candidate Name					
Sr. No.	Candidate Name	Opening Name	Status	Aptitude Marks	Personality Test Result	Resume Score	Action
1	Gaurav Palsale	Software Engineer	Rejected	2 / 3	<ul style="list-style-type: none"> Extroversion : 1.2 Neurotic : 3 Agreeable : 3.3 Open : 3.5 	67.28 %	
2	SAM OG	Technical Operations Engineer	Aptitude Submitted	6 / 5	<ul style="list-style-type: none"> Extroversion : 0 Neurotic : 0 Agreeable : 0 Open : 0 	88.00 %	
3	Shubh Dancer	Software Developer	PT Submitted	3 / 3	<ul style="list-style-type: none"> Extroversion : 0 Neurotic : 0 Agreeable : 0 Open : 0 	29.93 %	
4	Gaurav Palsale	Software Developer	Shortlisted	7 / 5	<ul style="list-style-type: none"> Extroversion : 0 Neurotic : 0 Agreeable : 0 Open : 0 	56.95 %	
5	Shubham OG	Accounts and Shared Services	Shortlisted	1 / 4	<ul style="list-style-type: none"> Extroversion : 0 Neurotic : 0 	19.99 %	

6.7. Job Detail (Candidate Side)



Job Title : Software Engineer

Job Description :

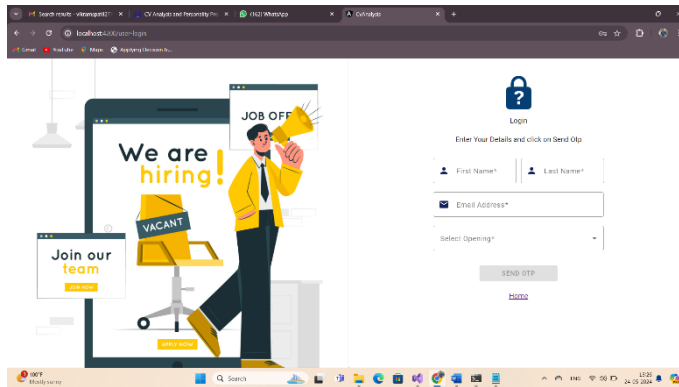
What We Need To See : B.Tech/M.Tech with 1+ years of experience in Java, Python/Javascript, Strong programming skills, OOPS, Data structures, and Algorithms. Experience in Windows/Linux, considered OS, networking, & Network problem solving and analytical skills. If you have experience in at least a few of the following skills, we will have no problem enough for our needs: development, & JavaScript/Node.js/PHP.

Skills Required :

- Communication Skills
- Problem Solving
- Time Management
- C++
- Creativity
- Critical Thinking

[Apply Now](#)

6.5. Candidate Login



Login

Enter Your Details and click on Send OTP

First Name* Last Name*

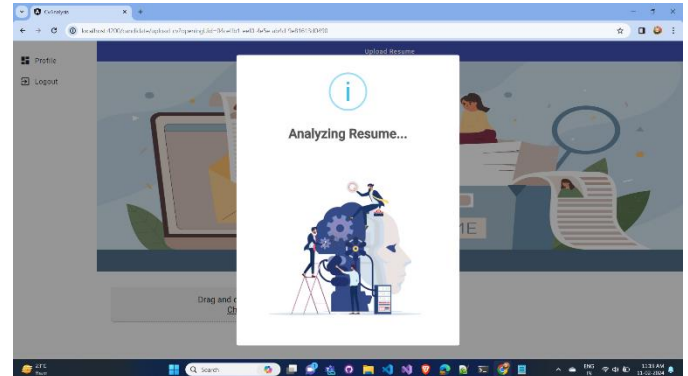
Email Address*

Select Opening*

[SEND OTP](#)

[Home](#)

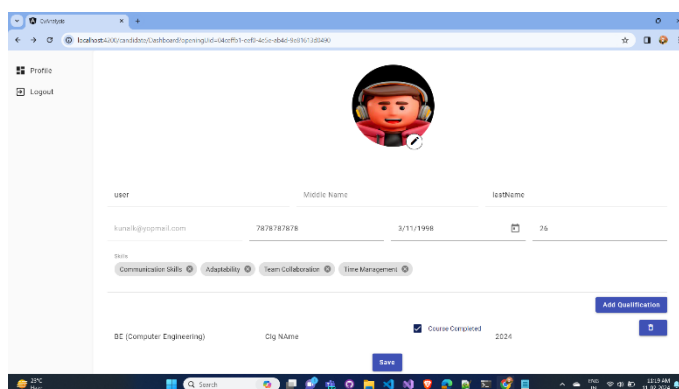
6.8. Resume Analysis (Candidate Side)



Analyzing Resume...

Drag and drop your resume file here

6.6. Candidate Profile (Candidate Side)



Profile

User

First Name: kumar@gmail.com Middle Name: 7878787878 Last Name: 3/11/1998

Skills

Communication Skills, Adaptability, Team Collaboration, Time Management

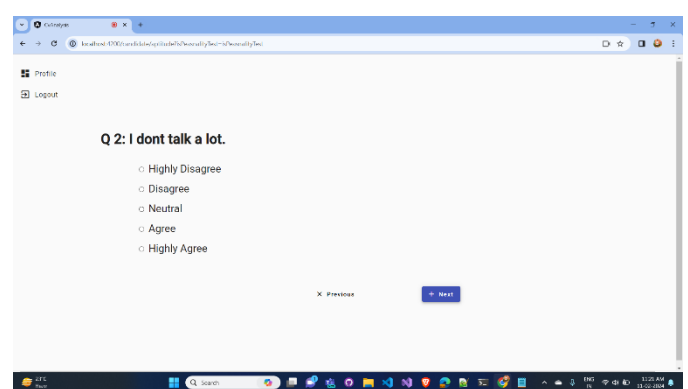
OC (Computer Engineering)

Cig Name: Course Completed: 2024

[Add Qualification](#)

[Save](#)

6.9. Personality Test (Candidate Side)



Q 2: I dont talk a lot.

☐ Highly Disagree
☐ Disagree
☐ Neutral
☐ Agree
☐ Highly Agree

[Previous](#) [Next](#)

7. Conclusion

The human resources department's workload will be reduced by this system. The candidate's CV that they filled out on the internet is used for CV analysis. Additionally, test results are useful in determining a candidate's attributes. As a result, the CV is shortlisted for the hiring process, and the HR department makes a just and suitable selection.

8. References

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