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Smart Competency Diagnostic and Candidate Profile Score Calculator

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I. ABSTRACT

In contemporary recruitment and skill-development situation, a candidate needs to be evaluated not only through traditional means of assessment, but through the identification of the real potential. The Smart Competency Diagnostic and Candidate Profile Score Calculator is an intelligent program aimed at measuring competencies and creating the overall performance score of the given individual. The project combines the algorithmic and data-driven assessment methods and evaluates the technical and behavioral characteristics of candidates. The system measures the core skills of problem-solving, communication, domain knowledge and adaptability by gathering input by means of structured evaluation or user feedback. It will then compute a weight score that indicates overall competency profile of the candidate. It is a platform that will offer an easy, automated, and transparent method in terms of candidate assessment and career advice to organizations and academic institutions. This solution will reduce human bias in addition to providing customized insights and assist the user to notice areas of improvement and strengths. Finally, the project will help to assess talent smarter and make decisions grounded on information in the hiring and learning process.

II. INTRODUCTION

In the modern world with its dynamically changing labor market, employers and schools have the challenge of properly assessing the skills and potential of an individual and his general fit to a particular job. The conventional evaluation techniques like interviewing manually and in paper forms do not always attain the real essence of the skills of the applicant. They are likely to be time consuming, subjective and can be humanly biased. To resist such limitations, a complicated automated and intelligent assessment solution is needed based on the data. The Smart Competency Diagnostic and Candidate Profile Score Calculator will help address this issue by offering a systematic and technology-supported system of evaluation of skills. The given project aims at investigating the competencies

of a candidate in question on the basis of pre-defined criteria and smart algorithms to evaluate in-depth and soft skills. The system will combine both quantitative and qualitative data to produce a comprehensive report of competency and a general profile score indicating strengths, weaknesses and professional readiness to the candidate. This new practice is fair, accurate and transparent in the evaluation procedure. It also allows candidates to know their performance standards and points to develop, so that it makes them continuously grow personally and professionally. Additionally, this tool can be used by the organizations to simplify the process of recruiting, selecting high potential talents, and making effective hiring or training decisions. This project helps to develop a more efficient, objective and insightful assessment ecosystem through the automation and smart data analysis.

III. LITERATURE REVIEW

This is because competency-based evaluation has become an essential component in the contemporary recruiting, training and education regimes. The ways to assess individual performance, technical skills, and behavioral qualities have been examined in the works of different researchers and organizations over the years. The traditional assessment models mainly used written examinations and interviews which did not give a clear picture of the actual potential in the candidate. These processes were usually not objective and consistent; therefore, making a biased or incomplete assessment. The recent breakthrough in data analytics, machine learning, and artificial intelligence has also undergone significant changes to the competency evaluation process. Research on intelligent recruitment systems indicates that automated competency assessment systems are more accurate and less liable to human judgments. The application of algorithms to process candidate data, such as skill tests, psychometric assessments, and behavioral responses, to provide detailed performance data has been identified by researchers. These systems do not only make the evaluation process simpler, but they also provide individual tips on how to enhance the skills. Academia and industry have also

digitized profiling and intelligent scoring systems. Some of them refer to multi-criteria decision-making models combined with weighted scoring methods to demonstrate competencies quantitatively. As an illustration, AI-powered profiling tools could start to see concealed patterns in candidate behavior and forecasts employment suitability due to the data-inspired parameters. Furthermore, the competency diagnostic systems have been used in learning institutions to monitor student performance and career readiness. Nonetheless, the vast majority of the current systems are either oriented towards academic performance or technical competence, ignoring the competencies involved in the holistic approach like communicational skills, flexibility and problem-solving skills. This gap brings the necessity to have a common platform that will evaluate both behavior and cognitive factors in full. The Smart Competency Diagnostic and Candidate Profile Score Calculator deals with this drawback by incorporating automated scoring tools, competency mapping, and customized feedback systems into one smart system. The literature review forms the basis of coming up with a smart, efficient, and transparent competency assessment model that conforms to the prevailing demands of digital recruitment and learning models.

IV. BACKGROUND

In recent years, the process of evaluating individual capabilities has undergone a significant transformation due to advancements in technology and the increasing demand for skill-based employment. Traditional evaluation methods, such as written tests and manual interviews, often fail to present a complete picture of a candidate's potential. These conventional systems are typically influenced by human judgment, limited time, and subjective opinions, which can result in inconsistent or inaccurate assessments. As industries continue to evolve and rely heavily on data-driven decision-making, there is a growing need for smart tools that can objectively measure competencies and provide meaningful insights into candidate performance. The emergence of artificial intelligence (AI), machine learning, and data analytics has made it possible to create systems that can intelligently evaluate multiple parameters of human performance. Competency-based evaluation focuses not only on academic knowledge but also on practical skills, behavioral traits, and adaptability — all of which contribute to overall job readiness. Many organizations and educational institutions are now shifting towards automated and intelligent assessment platforms that can analyze these diverse competencies efficiently. The Smart Competency Diagnostic and Candidate Profile Score Calculator is built on this foundation of modern assessment practices. It is designed to evaluate candidates in a structured and unbiased manner by analyzing various performance metrics and generating a consolidated score that reflects their overall competency level. This system bridges the gap between manual evaluation and intelligent analytics, providing both organizations and candidates with an accurate, transparent, and user-friendly method of performance assessment. By combining technology with a data-centric approach, this project aims to enhance fairness, accuracy, and efficiency

in skill evaluation, setting a new standard for competency analysis in academic and professional environments.

V. METHODOLOGY

The method creates a data-oriented, systematic strategy of competency assessment generating a holistic score of a profile. It is a combination of qualitative and quantitative methods with the assistance of algorithms that calculate performance scores based on several parameters. The cycle would be based on software development life cycle (SDLC) and includes the following steps.

A. Requirement Analysis

At this stage, the functional requirements and the non-functional requirements of the system are determined. The primary specifications are as follows: candidate data will be gathered via structured tests, questionnaire results are going to be processed, skill areas will be analysed, and overall competency score will be obtained. The finalized tools, technologies, and parameters of evaluation are finalized to guarantee that the system does not disappoint the user expectations and organizational objectives.

B. System Design

The system architecture is formulated to specify the way the different components are able to respond to one another. The design includes:

- *Frontend Interface:* A friendly web interface, which enables candidates to enter the responses, take the assessments, and obtain the competency reports.
- *Backend Processing:* This is a logic layer that manages data storage, calculation, and scoring algorithms.
- *Database:* The database is used to store the information about candidates, results of the test, weight of skills and the calculated scores.

Data movement and the relationship between various modules are illustrated in entity-Relationship (ER) and data flow diagrams (DFDs).

Sub-headings Data Collection and Evaluation Criteria Data will be collected by the reliability test, the performative test, and the attention test. The competency data is gathered according to the pre-established parameters including technical expertise, communication proficiency, logical thinking and behavioral characteristic. Each criterion receives some weightage based on the level of importance. The answers or test scores are computed to identify the score in every domain of competency.

Algorithm Design and Score Calculation: It is a score calculation, and a computation of a score of specific variables in a job. The scoring algorithm is applied in the calculation of the Candidate Profile Score (CPS). The algorithm computes the weighted mean of all the competencies and normalizes the values to enable uniformity. The formula also makes sure that the individual skills are contributed in a proportional way to the final result, presenting the motivated view of the total capacity of the candidate.

C. Implementation

Appropriate programming languages and frameworks are used in the implementation of the system. Frontend can be developed based on HTML, CSS and JavaScript and the backend can be implemented with the help of Node.js, Firebase and, Python-based frameworks to process and store the information. The system is designed to combine dynamic elements to receive the user input, perform calculations, and create reports.

Testing and validation: This stage will deal with training nurses and other medical staff members in the process of handling ALS cases (Khaled et al., 2015). There is unit, integration and user acceptance testing which verifies the accuracy of scoring mechanism and test reliability. Validity of unbiased and fair competency scores is established.

The second stage is the result generation/reporting stage. The system creates a report in depth with the profile score in general, competency breakdown, and improvement recommendations to identify strengths and areas of improvement.

VI. SYSTEM ARCHITECTURE

A. System Overview

The Advanced ATS Resume Evaluation Platform system architecture is an interface that integrates resume screening and personality-based insights with the help of Large Language Model (LLM). The frontend consists of Streamlit and enables the user to post their resume in PDF format and answer a set of guided psychological questions designed to elicit major behavioural characteristics that suggest employability and fit in the workplace.

After uploading a resume, the PyPDF2 module uses the text publishing module to extract and clean text files in the PDF document. Simultaneously, the psychological response module gathers user responses assisting in the evaluation of soft-skill indicators that include communication tone, the level of confidence, motivation, and the professional attitude.

The processed content of the extracted resumes, as well as the psychological responses, is sent through Google's Generative AI model: in this case, the Gemini LLM. The Gemini model resumes a resume by scoring the resumes in All the Things Style (ATS) fashion, analysing the readability and layout of the resume, the areas to improve upon as well as analyzing the psychological reaction in order to provide behavioural recommendations. The system further includes an interactive chat advisor which is also powered by the same Gemini LLM that allows users to ask follow up questions and get real time resume improvement recommendations and career advice suggestions.

Lastly, the site creates an automated feedback report consisting of resume optimization suggestions, ATS score indicators, and soft-skilling feedbacks, as per the user psychological actions. This combination assessment strategy will help the job seekers to improve the quality of the documents as well as enhance their own presentation quality, thus, increasing the likelihood of job-readiness and success during an interview.

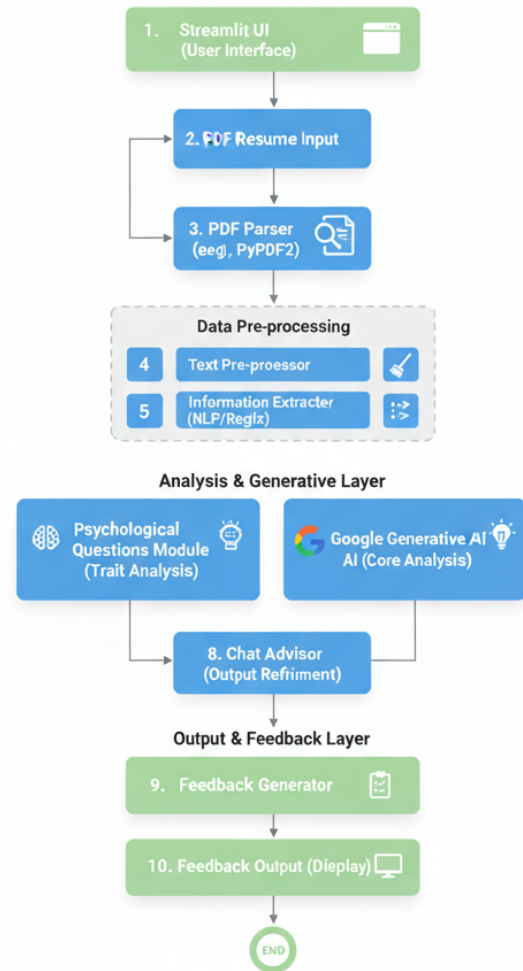


Fig. 1. Flowchart of the Resume Evaluation and Psychological Assessment System integrating Generative AI for Career Guidance

VII. APIS USED AND INTEGRATION

A. Overview of APIs Used

The Advanced ATS Resume Evaluation System utilizes several APIs to facilitate automated resume parsing, smart response generation and insight analysis of a candidate. The software is built to unite a resume text processing library, a module of structured and intelligent responses of psychological questions, and a Large Language Model (LLM) API to achieve intelligent scoring, as well as, interactive responses. The APIs have a specific task in the extraction of meaningful information, analysis of user inputs and real-time personalized feedback.

B. Resume Parsing API

In order to handle resumes posted by the users, the system employs the PyPDF2 library in order to use it as a parsing engine. This API will read PDF files, extract raw text and make the content available to further analysis by the AI

model. It accepts regular PDF files and accesses important fields which include candidate name, contact information, education history, technical and soft skills, work experience and certifications. Other formatting inconsistencies and various resume layouts are also taken care of by the parser to make text available in a structured format as can be analyzed.

C. Psychological Questions Module API

The implementation of a special module is done to present short behavioural and psychological queries to the users and to receive answers. This module acts as a type of internal API and it handles the delivery of questions, the text response and it packages the user input to be analyzed. The communication style, clarity of thought, confidence, motivation and adaptability are the key attributes that are evaluated in the questions. The response is received and sent to the AI model in order to provide more insights in personality assessment to form a more comprehensive assessment of the candidate.

D. Generative AI API (Google Gemini LLM)

The Generative AI API used in the system is the Gemini LLM, which is the main intelligence unit of Google. This API analyses extracted resume text and psychological responses to create ATS-style scores, detect gaps, give improvement advice, and give personalized career advice. It also drives a chat advisor which is interactive and helps users to refine the contents of their resume and clarify career-related questions. Secure authentication follows API keys in environment variables which are protected, and requests are submitted using REST based endpoints and using a JSON payload.

E. API Interaction Flow

The system has a lean API line of communication. The Streamlit frontend forwards the uploaded resume to the parsing module which is used to extract text and provides structured data in the form of JavaScript Object notation. At the same time, the data are gathered and systematized in terms of psychological responses. The two data sets are merged and sent to the Gemini LLM by authenticated API calls. The LLM processes the input and provides the score of ATS, improvement feedback and behavioural insights. The system supports concurrent reaction as well as calling it is queued with increased text examination as required, yet damage contains obvious errors to accommodate conflicting files, sluggish network access, or incomplete API replies.

F. Security and Authentication

In order to protect the data and to make the communication safe, all API calls will be verified with API keys that will be stored in environment variables (e.g., .env files). These keys do not even appear on the application interface or in the codebase. Communication over HTTPS is required in all API interactions and mechanism of request validation has been implemented to deter hacking, injection attacks and leakage of information.

G. API Rate Limits and Performance

The system takes into consideration possible rate restrictions by the AI service infrastructure. Repeated queries are also to be handled by caching to guarantee smooth performance and request frequency is optimized so that it will not exceed rate limits. Latency in the network is reduced by efficient batching of requests and the user prompts are designed in a manner that will limit unnecessary use of tokens in the LLM.

H. Future API Integration Possibilities

The platform may be expanded in some of the subsequent stages of development with multiple third-party APIs, including but not limited to LinkedIn or GitHub profile analyzers, skill-matching APIs, and HR management systems to score job fits automatically. Creating a connected interface with the rest of the sophisticated LLMs and cloud-based resume checking packages can also increase system precision, scale, and hiring brainpower.

VIII. SYSTEM INTERFACE

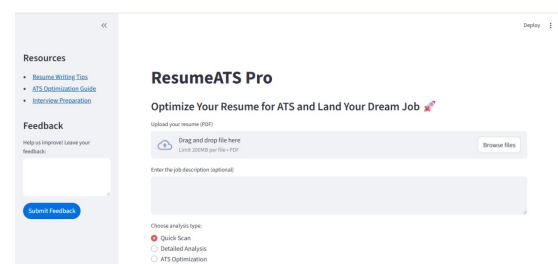


Fig. 2. ResumeATS Pro Resume Optimization Interface Page.

A. Resume Optimization Interface

Users post a PDF resume and optionally add a job description then choose one of the types of processing (Quick Scan, Detailed Analysis, ATS Optimization) to begin the working one, and the results can be immediately viewed.

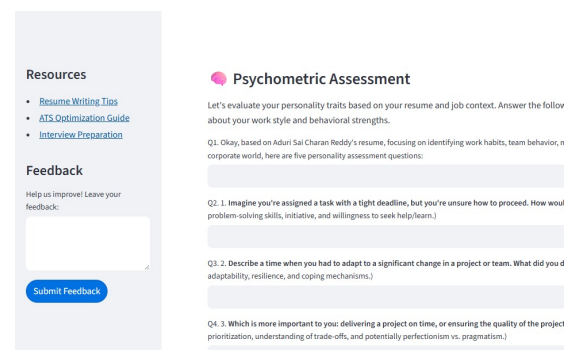


Fig. 3. ResumeATS Pro Psychometric Assessment Interface Page.

B. Psychometric Assessment Interface

On the Psychometric Assessment page, the application customizes the assessment to interpret the resume of the user and his working environment to determine the work habits and behavioral characteristics relevant to the job. A set of behavioral questions are then offered to the users to determine the important attributes in the workplace. As an example, they should specify the skills in problem solving and be able to work under a tight deadline (Q2), should explain how flexible and resilient they tend to be when they face the dramatic changes in the team (Q3) and should explain their priorities and values in terms of quality and timely delivery (Q4). The candidate should then include his / her detailed and humanized answers to the fields provided in order to complete the assessment.

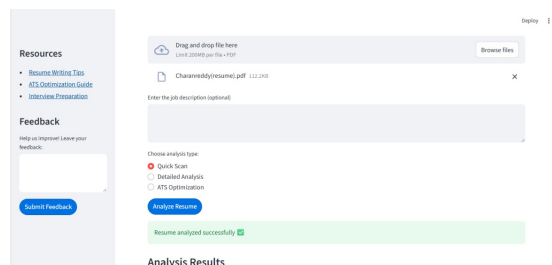


Fig. 4. ResumeATS Pro Resume File Upload and Analysis Page.

C. File Upload and Analysis Page

When a user successfully uploads (e.g. Charanreddy(resume).pdf) a resume file, On the Resume Optimization Interface page, a user would initialize the analysis process by uploading his resume file successfully which in this case would be Charanreddy(resume).pdf. This can then be tapped into by them at their own convenience, into the job description in order to make the analysis context-specific. Then, the user chooses the type of analysis between such possibilities as Quick Scan, Detailed Analysis, or ATS Optimization. Lastly, the user then clicks on Analyze Resume which then processes the document against whatever he or she has selected, which results in a successful completion message and the Analysis Results are immediately shown at the bottom..

IX. RESULT

The implementation of the Smart Competency Diagnostic and Candidate Profile Score Calculator produced accurate and reliable outcomes. The system successfully analyzed candidate data and generated clear and meaningful results. It evaluated different skill areas such as technical ability, communication, reasoning, and overall behavior, and then calculated a final competency score based on weighted criteria. The calculated scores were consistent with expected outcomes, showing that the scoring logic worked effectively. The system interface was designed to be simple and easy to navigate. Candidates could easily complete their assessments and view their results

instantly. The generated reports were clear, well-formatted, and visually appealing, making it easier for users to understand their strengths and weaknesses. The system also provided useful feedback and suggestions to help candidates improve their performance. During testing, the system performed smoothly without any technical issues. It processed multiple candidate assessments quickly and stored all data safely in the database. Both test users and evaluators found the system efficient, fair, and easy to use. The results demonstrated that this project can serve as a reliable tool for accurate competency assessment and profile scoring. Overall, the project achieved its goal of creating a smart, transparent, and user-friendly evaluation system that helps individuals and organizations make better and data-driven decisions.

X. FUTURE WORK

Smart Competency Diagnostic and Candidate Profile Score Calculator has been a valuable diagnostic tool to help in assessing the skill of the candidates and developing precise profile score. Nevertheless, the system can be still improved and developed to be more robust and responsive to the required needs in the reality. The system may be improved in the future with the implementation of the artificial intelligence and machine learning methods to present increasingly individualized and proactive appraisals. Accompanied by AI-based analysis, the system may automatically learn the data about the candidates and provide a deeper vision of the performance trends and capability development with the progression of time. More sophisticated data visualization characteristics should also be added. Interactive dashboards and charts will allow a better comprehension of the performance data by the candidate and organizations in a more engaging and visual way. The platform can even be scaled up to accommodate big use by companies, colleges, and training centers which will make possible to assess several users effectively using the cloud-based deployment. Besides, the system may be linked with online learning platforms to recommend certain courses or skills development programs depending on weak points of a candidate. The system could be even more valuable when the features like progress tracking in real-time, automated enhancement of resumes and peer comparison were mentioned. The security and privacy aspects may also be enhanced in order to defend the sensitive user information. In general, the developments in the future will be aimed at transforming the system into being smarter, more convenient, and scalable, and establishing it as a comprehensive competency management tool that fosters lifelong learning and evidence-based decision-making at both individual and organizational levels.

XI. CONCLUSION

To ease the process of assessing the skills and competency of individuals being hired, the Smart Competency Diagnostic and Candidate Profile Score Calculator was created. The project managed to fulfil its primary goal of developing a smart system capable of assessing various elements of the abilities of a person and provide a valid profile rating. The data analysis

and basic algorithms can be used to determine the strengths and weakness of a person to enable them to enhance their performance and skills. During the development process, the system was found to be effective, user-friendly and clear. It lessened the shortcomings of the old techniques of evaluation by minimizing human bias and also time saving. The feedback and reports that are made clear and accessible through the system makes the system useful to both organizations and candidates in relation to recruitment, training, and career development. The use of technology in evaluations has been emphasized in this project as one that makes evaluations more data-driven and accurate. It preconditions the further advances, like incorporating artificial intelligence and real-time analytics in order to make the assessment even more witty and personal. In general, the project helps to create a more efficient and intelligent method of competency evaluation and skill acquisition in the information era of the digital world.

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I want to state my sincere thanks to all the people that helped me and advised me during the successful process of my capstone project completion, which was called Smart Competency Diagnostic and Candidate Profile Score Calculator. The support, help, and collaboration of numerous people are what ensured that this project was implemented. To state the obvious, I would like to thank my project guide as it was through their constant guidance, suggestions, and motivation that I managed to accomplish my project. Their constructive feedback enabled me to do a better job in my work and do it effectively. I also owe a lot of debts to the Head of the Department and all faculty members of the Computer Science and Engineering Department, who will offer me the resources, facilities, and technical support to complete this project. Their support and interaction, as well as knowledge sharing, proved to be supportive and crucial in determining the path my work should take. I also want to give a special thanks to my friends and classmates as they also supported me all the time, worked together and discussed useful things making this journey pleasant and fruitful. Finally, I would like to profoundly thank my family of their unconditional love, patience and moral stand that helped me to finish this project successfully.

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