iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** IV **Month of publication:** April 2024

DOI: https://doi.org/10.22214/ijraset.2024.59645

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue III Mar 2024- Available at www.ijraset.com

Resume Application Tracking System with Google Gemini Pro

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Abstract: ***Resume Application Tracking System with Google Gemini Pro provides an innovative solution to the problems in the recent hiring. The main aim of this system is to help the job seekers in order to grab an oppurtunity in the competitive job market and ensure that the process of resume screening goes smoothly. The technology used in this system is Google Gemini Pro, the most capable and large language model created by Google DeepMind. This technology is capable of interpreting code, video, audio, image, text and helps to increase the accuracy and speed of resume screening. The system also makes use of Streamlit for the user interface and PyPDF2 for direct text extraction from resumes. Users can provide the appropriate job description and upload their resumes, which will then be analyzed and the system will display the approximate matching percentage, missing keywords and a brief profile summary. The system will automatically evaluate and classify resumes in real-time applications, delivering recruiters an easy way to find eligible applicants. This approach is used in wide range of sectors and can be beneficial as the job market is down due to recession. Therefore, the goal of this system is to tranform the resume processing industry, saving recruiters time and money while also raising the standard of candidate selection.***

Keywords: Resume Application Tracking System, Google Gemini Pro, Streamlit, PyPDF2, Matching Percentage, Missing Keywords, Profile Summary.

I. INTRODUCTION

The resume application tracking system stands out as an innovative leader in the ever-changing environment of today's employment markets. This initiative is fundamentally an attempt to simplify and increase the resume processing efficiency. This system is set to transform the way resumes are assessed by incorporating state-of-the-art technologies like Google Gemini Pro, Streamlit, PyPDF2, and python-dotenv, making the system more user-friendly and error-proof for all parties involved. The principal objective of this project is to tackle the persistent requirement for enhanced efficacy and precision in the hiring procedure. The process of manually screening resumes can be complicated and error-prone in today's competitive job markets, where hundreds or even thousands of resumes are submitted for a single post. With its ability to quickly and accurately read resume material through artificial integllience (AI) algorithms, Google Gemini Pro proves to be a formidable friend in this attempt. This guarantees that no qualified applicant is missed because of human error and also saves recruiters a great deal of time. Whether it's a small startup or a multinational corporation, the project can be tailored to meet the unique needs and requirements of any recruitment process. Its modular design allows for easy integration with existing ATS systems, ensuring a seamless transition for organizations looking to enhance their recruitment efficiency.

The system uses Streamlit's user interface to its full potential in order to implement this creative approach. Streamlit, renowned for its adaptability and simplicity, offers a user-friendly interface that enables smooth system interaction. Resumes can be uploaded, and applicants can get comprehensive feedback on how well their resumes match job descriptions. Direct text extraction from resumes is made possible in large part by PyPDF2, another essential component. One notable aspect of the technology is its capacity to compare resumes to job descriptions.

The insights this functionality offers to recruiters and job seekers are invaluable. Recruiters can obtain comprehensive reports that show how well each candidate's resume matches the job specifications, as well as which qualifications or keywords are lacking. This system's core is its use of cutting-edge technologies to produce a smooth and effective resume processing system. Google Gemini Pro, an AI-powered platform well-known for its machine learning and natural language processing skills, is in the forefront. The system also uses python-dotenv library which is used to store environment variables and prevent them from unauthorized access.

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This system uses Google Generative AI API (Application Programming Interface) which allows it to access the Google's Generative AI service inorder to generate the content based on the input. Hence, the system represents a paradigm shift in modern recruitment processes and helps to stay ahead in today's competitive job market.

II. LITERATURE SURVEY

These surveys offer insights into the advancements, methodologies, accuracies, and challenges associated with various approaches to resume parsing, analysis, classification, and screening. They provide valuable perspectives on the evolving landscape of recruitment technologies and the ongoing efforts to improve efficiency, accuracy, and fairness in candidate evaluation processes.

1) The first survey, titled "The Beginning of Resume Parsing in HR Recruitment Process & SMART Advancements in Chronological Order," conducted by Aakankshu Rawat, Siddharth Malik, Seema Rawat, Deepak Kumar, and Praveen Kumar in July 2021, outlines the historical evolution of resume parsing technology within HR recruitment processes. This study tracks the development of resume parsing from its inception to the current era of SMART (Specific, Measurable, Achievable, Relevant, Time-bound) innovations. It discusses the advancements in accuracy achieved through SMART methods, focusing on improvements in precision and recall rates. Despite these advancements, the survey highlights a persistent challenge in handling complex and diverse resume formats, which can lead to parsing errors or incomplete extraction of relevant information.

2) In the second survey, "Modern Resume Analyser For Students And Organisations," conducted by Vansh Nawander, Shrenita Elma, Andhoju Karthikeya, Manuka Koushik Yadav, and Sai Karthik Kotala in October 2022, the study focuses on utilizing natural language processing (NLP) and machine learning algorithms to analyze resumes. This approach aims to enhance the efficiency of candidate screening and selection processes by achieving high accuracy in parsing and matching resumes to job descriptions. However, a drawback highlighted in this survey is the potential introduction of biases or the oversight of unconventional qualifications or experiences, which could disadvantage candidates with non-traditional backgrounds.

3) The third survey, "Applicant Helper System for Resume Using Python And NLP," conducted in April 2023 by Lynsha Helena Pratheeba, Prajwal S, Pavan Kumar S, Naveen Kumar V, and Nithin Krishna, focuses on a system that employs Natural Language Processing (NLP) techniques in Python to analyze and process resumes. This system aims to extract relevant information such as skills, experiences, and qualifications. The study emphasizes that the accuracy of the system heavily depends on the quality of the NLP models and training data used. Challenges highlighted include potential bias in the NLP models, particularly with diverse or unconventional resumes, and the system's performance degradation with poorly formatted or misspelled terms.

4) The fourth survey, "Resume Classification and Ranking using KNN and Cosine Similarity," conducted in August 2021 by Rajath V, Riza Tanaz Fareed, and Sharadadevi Kaganurmath, explores the use of KNN (K-Nearest Neighbors) for resume classification and ranking. This methodology relies on the similarity of features between resumes to classify and rank them based on their proximity to others in the dataset. The survey notes that KNN's accuracy depends on the choice of parameters such as k (number of neighbors) 5 and the feature representation of resumes. However, drawbacks include computational intensity for large datasets, sensitivity to noisy or irrelevant features, and the need for careful parameter selection.

5) Lastly, the fifth survey, "Resume Screening and Ranking with spaCy," conducted by P. Jagadish, V Abhishek Shukla, Anant V, Anuj K, and Prasanth Kumar Reddy, focuses on the use of Artificial Intelligence technology in Applicant Tracking Systems (ATS). The study highlights how ATS systems assess resumes based on factors such as work experience relevance, education background, word choice strength, application style, and brevity, assigning scores to each candidate accordingly. While offering efficient screening capabilities, the accuracy of ATS systems may vary based on the algorithm's ability to interpret and prioritize relevant information. Drawbacks include the inability to achieve text summarization and the potential oversight of qualified candidates due to rigid scoring criteria and similar phrases in the ATS.

III.PROPOSED METHODOLOGY

As the challenges which have been highlighted in our abstract, our proposed system has introduced a resume ATS tracking with Google Gemini Pro.

The main aim of our proposed system is to overcomer the challenges which are faced by the existing system. We have added advanced AI technologies in our proposed system.

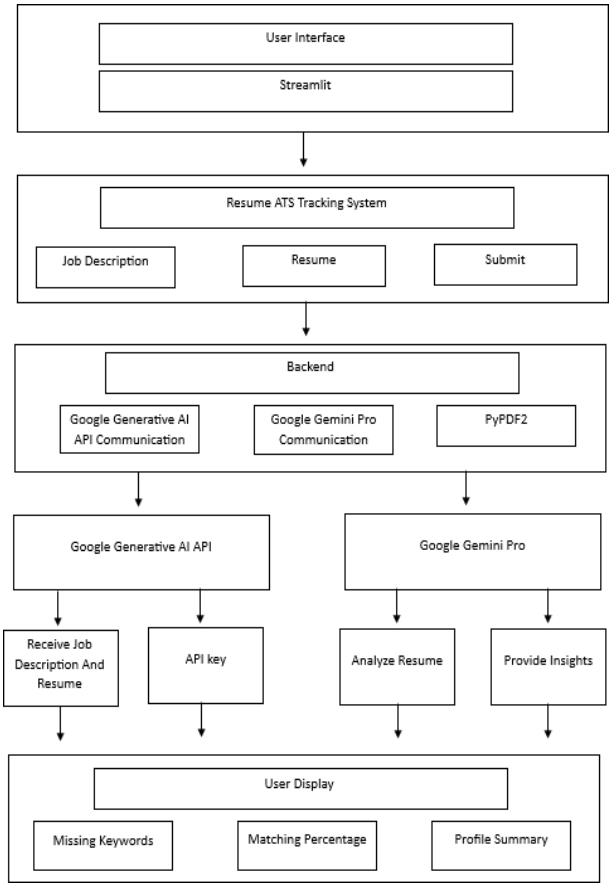


Fig. 1 Proposed Model

A. AI-Driven Resume Parsing System

Utilising the advanced artificial intelligence capabilities of Google Gemini Pro, our system will revolutionize resume parsing. Google Gemini Pro's algorithms enable precise extraction of key information from resumes, ensuring unparalleled accuracy in understanding context and matching candidates with job requirements. By employing natural language processing and machine learning, the system will comprehensively analyze resumes, extracting crucial details such as work experience, skills, education, and achievements. Recruiters can rely on the system to accurately identify qualified candidates.

B. Real-Time Analysis and Feedback

Our system offers real-time analysis and feedback, providing instant insights to recruiters and candidates. Through continuous monitoring and evaluation, recruiters gain immediate feedback on resume quality, candidate suitability, and areas for improvement. This real-time feedback loop enables recruiters to make data-driven decisions swiftly, optimizing the recruitment process. Candidates also benefit from instant insights into how well their resumes align with job requirements, allowing them to make necessary adjustments to enhance their profiles.

C. Interactive User Interface

Built on Streamlit, our system boasts an interactive user interface that enhances the user experience for recruiters and candidates alike. The intuitive interface simplifies resume uploading, analysis, and interaction, making the entire process seamless and user-friendly. Recruiters can easily navigate through resumes, access detailed insights, and manage candidate profiles with ease. Similarly, candidates can upload their resumes effortlessly, receive instant feedback, and interact with the system in a straightforward manner. The interactive nature of the user interface promotes engagement and collaboration, facilitating effective communication between recruiters and candidates.

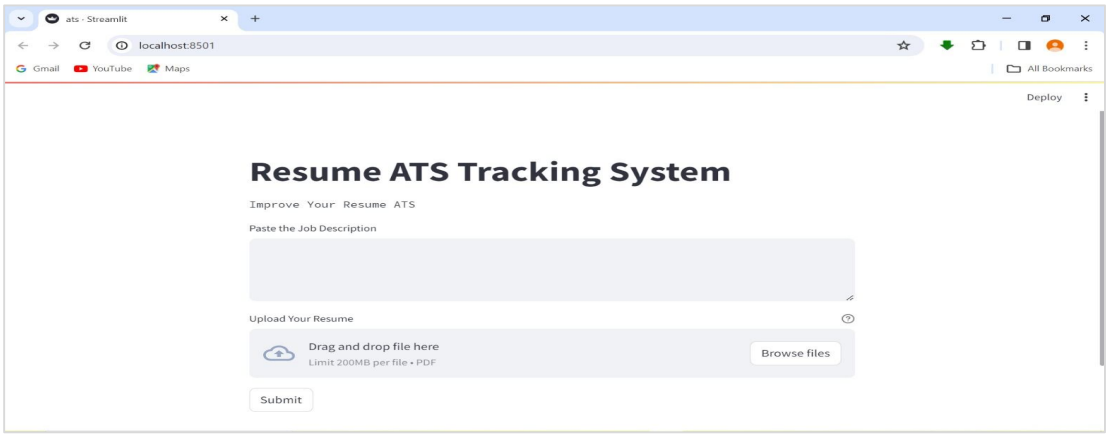


Fig. 2 User Interface

D. Seamless Integration

Our system offers seamless integration with external tools and platforms, enabling streamlined collaboration and workflow optimization for recruiters.

Whether integrating with existing Applicant Tracking Systems (ATS), HR software, or third- party recruitment platforms, the system ensures compatibility and interoperability. Recruiters can leverage the system's integration capabilities to access a centralized platform for managing resumes, conducting analyses, and communicating with candidates. By eliminating the need for manual data entry and duplicate efforts, seamless integration enhances efficiency and productivity in recruitment operations. Additionally, recruiters can customize integrations based on their specific requirements, further optimizing their workflow and enhancing overall performance.

E. Scalability and Performance

Powered by Google Gemini Pro's scalability, our system is capable of handling large volumes of resumes and data efficiently. As the volume of resumes increases, the system can dynamically scale resources to accommodate growing demands, ensuring optimal performance at all times. This scalability enables recruiters to manage high volumes of resumes without compromising on speed or reliability. Additionally, the system's robust performance ensures timely processing and analysis of resumes, minimizing delays in the recruitment process. With Google Gemini Pro's scalable infrastructure, our system can effectively support the needs of organizations of all sizes, from startups to multinational corporations, providing unmatched performance and reliability in resume processing and analysis.

F. Resume Application Tracking System

Upon determining the job description and uploading the user's resume in PDF format. The resume application tracking system analyzes the resume against the job description using the powerful capabilities of Google Gemini Pro and displays the matching percentage, missing keywords and a short profile summary of the candidate.

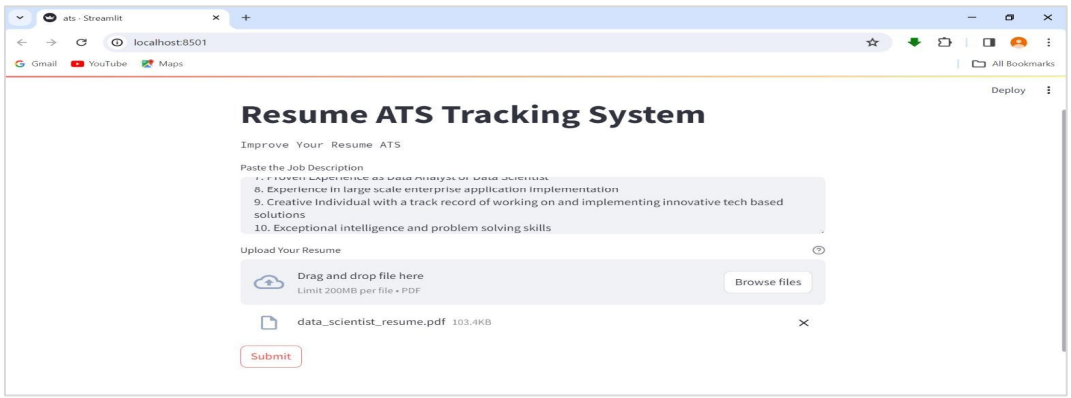


Fig 3. User Input

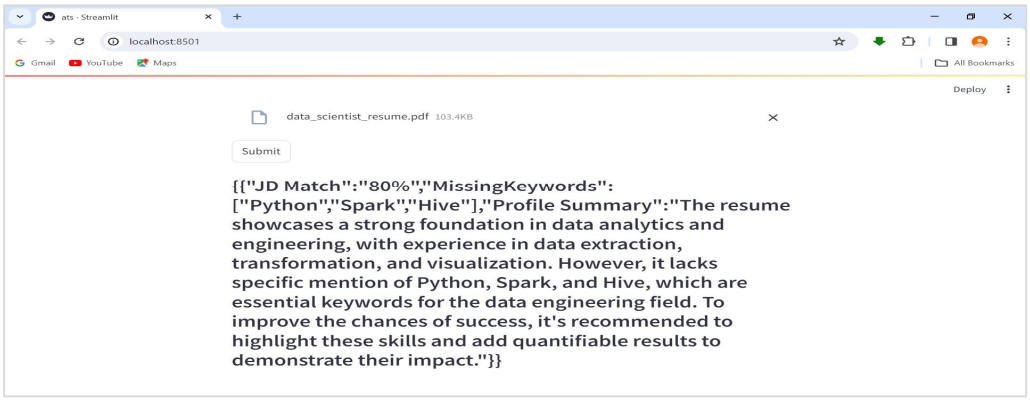


Fig 4. Output

IV. RESULTS AND DISCUSSIONS

The resume is analyzed in this resume application tracking system. The web application is built with the help of Streamlit library that provides an interactive user interface. The user input a job description and upload a PDF resume. Upon submission, the system presents matching percentage, missing keywords, and a profile summary. The highlighted submit button indicates user engagement. When the user clicks on the submit button, then the web application sends the resume and the job description to the Google Generative AI API. This API enables a way to access the services of the Google Gemini Pro and with the help of API key, the services of the AI platform are used which interprets the input and generates the desired output to the API. The API receives this output and sends it to the web application. Hence, the web application displays the generated output on the screen to the user. This user-friendly interface streamlines resume matching, providing immediate feedback on resume-job alignment. It enhances the user experience, aiding informed decision-making in job applications.

V. CONCLUSION

In conclusion, the project marks a transformative shift in recruitment technology, blending innovation with user-centric design. Integrated seamlessly with the user- friendly Streamlit web application, it provides recruiters and job seekers with efficient resume analysis tools, streamlining the recruitment process significantly. Leveraging Google's Generative AI API and the Gemini Pro model, automation simplifies keyword extraction, precise matching, and profile summaries generation, enhancing application optimization. The emphasis on user experience is evident through its intuitive interface and backend efficiency, enabling informed decision-making in the competitive job market. Moreover, the project signifies a significant leap forward in effective, accurate, and user-centric recruitment solutions, setting a new industry standard. Beyond immediate impacts on resume processing, it promises to revolutionize recruitment by introducing data-driven insights and user-centric design principles, improving overall quality. With potential to enhance speed, accuracy, and efficiency, the project heralds a new era where innovation and user needs converge, reshaping hiring practices globally. As organizations adopt these innovations, they gain a competitive edge in talent acquisition and retention, shaping the future of hiring practices worldwide.

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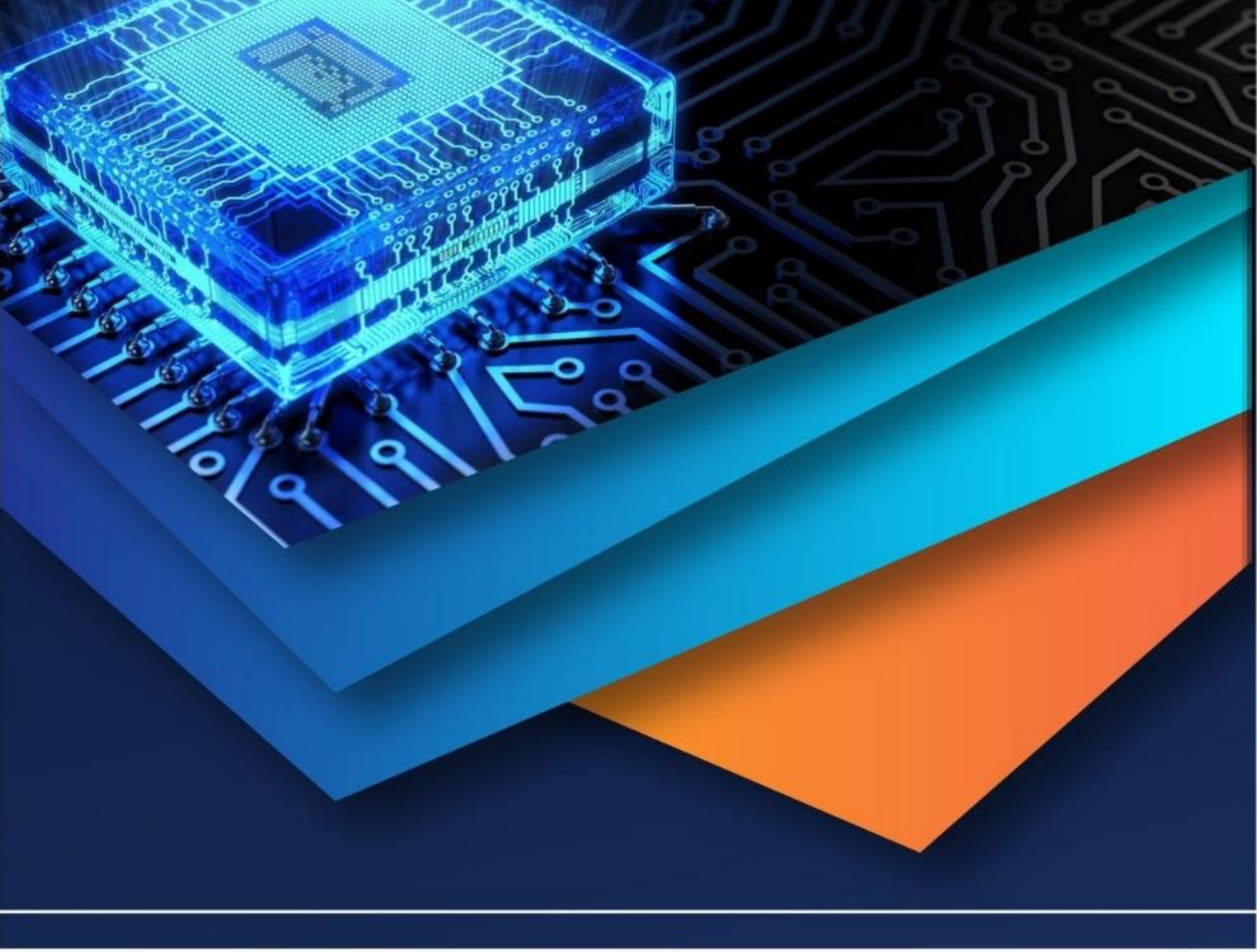
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