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Smart Career Assistance Portal Using AI and Real-Time Industry Insights

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Abstract: ***As industries evolve rapidly, students and early-career professionals face increasing challenges in aligning their academic profiles with current market demands. Traditional career guidance systems often lack personalization, adaptability, and real-time insights. This paper presents an AI-powered career guidance platform designed to bridge this gap by offering an integrated set of tools, including an ATS-optimized resume builder, an intelligent cover letter generator, mock interview preparation, and weekly-updated industry insights. Built using Next.js and Shadcn UI, the platform features a responsive and intuitive user interface. Upon email-based login via Clerk authentication, users complete a profile form that captures their industry, specialization, experience, skills, and professional bio. The system then generates a dynamic dashboard displaying in-demand skills and salary trends using data fetched weekly through Inngest. Resume generation is fully customizable and enhanced with AI-generated content tailored to the user's domain. The intelligent cover letter module analyses job descriptions to craft role-specific documents. A mock interview module presents domain-aligned quizzes, tracks user progress across sessions, and provides AI-driven improvement suggestions. Content generation is powered by the Gemini API, a transformer-based model developed by Google. At the same time, a custom matching algorithm scores how well a user's skills align with various job roles. Preliminary evaluations indicate improved job readiness, user engagement, and satisfaction. By unifying real-time labour analytics with AI-enhanced preparation tools, this system supports informed career decision-making and offers a scalable, personalized solution for modern employability challenges.***

Keywords: Artificial Intelligence, Career Guidance, Resume Builder, Gemini API, Inngest, Clerk Authentication, Industry Trends, Cover Letter Generator, Mock Interview, Job Role Matching, Full Stack Development, Personalized Recommendations

I. INTRODUCTION

Career decision-making is a complex process for students and early professionals entering an increasingly dynamic and competitive job market. Traditional career guidance systems often lack personalization and fail to keep pace with rapidly evolving industry demands. Students are commonly presented with outdated information and generic recommendations, which do not align with their skills, preferences, or the real-time needs of employers. As a result, many graduates face difficulties navigating their professional journey, often struggling to present their qualifications effectively or identify high-demand career paths.

Recent advancements in Artificial Intelligence (AI), natural language processing, and web technologies offer new opportunities to modernize and enhance the career guidance process. AI has demonstrated the ability to interpret large volumes of data, generate personalized content, and provide predictive insights that are highly relevant to both job seekers and employers.

This paper presents a Smart Career Assistant Portal combining multiple features into a scalable platform. Key functionalities include an AI-driven, ATS-optimized resume builder, a personalized cover letter generator based on job descriptions, a mock interview system with performance tracking, and a dynamic industry insights dashboard. The platform leverages React 19, Next.js 15, Prisma ORM, NeonDB, and the Gemini API for AI content generation. Weekly updates of skill demand and salary trends are automated using Inngest, while Clerk ensures secure email-based authentication. By integrating these components, the system provides a comprehensive, real-time solution for career readiness. The aim is to help students make informed career decisions, improve the quality of their job applications, and better align their profiles with industry expectations.

II. LITERATURE SURVEY

In [1], the development of an AI-powered customized university and career guidance system marked an important shift from static counselling to dynamic, data-driven support. The authors introduced a multi-questionnaire approach to assess student profiles and preferences, which were then matched with suitable educational and career pathways. The system provides effective personalized guidance based on psychometric analysis and academic performance. However, it lacked integration with real-time job market analytics, meaning its recommendations were limited to predefined mappings and were not adaptive to changing industry demands.

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This study [2] proposed an AI-based career counselling tool that factored in both academic performance and extracurricular activities. Machine learning algorithms like K-Nearest Neighbours (KNN) and Support Vector Machines (SVM) were employed to classify students into suitable career categories. The project highlighted the importance of a holistic evaluation for guidance but relied on static training data. As a result, it could not accommodate evolving trends in the labour market or provide updated insights, which are essential for modern employability.

In [3], the CareEx platform introduced a dual-layered AI system to support career counselling alongside university eligibility prediction. The system used student academic input to determine suitable programs and institutions. Although the framework improved accuracy in predicting eligibility and academic fit, it did not extend its functionality to include tools such as resume generation, interview readiness, or integration with real-time market trends—features that are essential for comprehensive career support.

The research in [4] introduced a conversational AI system to simulate career counselling through chat-based interactions. This model leveraged natural language processing (NLP) to answer frequently asked questions and provide initial career suggestions. While it enhanced user engagement through a more human-like experience, the system's inability to handle multi-layered queries and lack of auxiliary tools like interview simulators or resume customization reduced its long-term effectiveness in preparing students for real-world job applications.

Finally, in [5], a simulation-based solution using first-person game-like interactions was introduced to allow students to explore different career environments virtually. The tool successfully engaged users through immersive experiences and visual storytelling. However, its deployment required significant computational resources, making it less accessible to students without high-end devices or internet connectivity. Moreover, it focused mainly on exploration rather than offering structured guidance or actionable preparation tools.

The present study addresses the limitations found in previous works by integrating AI-driven features such as ATS-optimized resume and cover letter generators, role-specific mock interviews, and a dynamic industry trends dashboard. By incorporating real-time data updates using Inngest and leveraging the Gemini API for content generation, the proposed system provides a scalable, personalized, and market-relevant platform to support student career development.

III. METHODOLOGY

The proposed Smart Career Assistant Portal is designed to offer personalized support to students and early-career professionals by integrating AI content generation, real-time labour analytics, and an intuitive user experience. The methodology encompasses system design, user flow, data processing, and modular functionality across the resume, cover letter, mock interview, and industry insight modules.

A. System Architecture

The system is developed using a full-stack web development approach to ensure seamless integration between the frontend and backend layers. The frontend is built using React 19 and Next**.**js 15, selected for their modern, component-based architecture, built-in routing capabilities, server-side rendering (SSR), and optimized performance for scalable applications. These technologies allow the system to deliver fast page loads, modular code management, and enhanced SEO benefits, all crucial for modern web applications.

To ensure a consistent, responsive, and accessible user interface, the application leverages Tailwind CSS for utility-first styling and Shadcn UI for ready-made, customizable UI components. This combination provides developers with rapid styling capabilities while maintaining design consistency and responsiveness across various devices, thereby enhancing user engagement and usability.

The backend is powered by Next**.js** API Routes, which act as RESTful endpoints for handling business logic, form submissions, user authentication flows, and third-party API interactions.

This approach ensures that the frontend and backend remain tightly integrated within a single codebase, simplifying development and deployment. For persistent data storage, the system uses NeonDB, a scalable PostgreSQL database, accessed and managed through the Prisma ORM. Prisma provides a type-safe, auto-completing query builder and schema migration tools, reducing runtime errors and significantly improving developer productivity. Its declarative data modelling and tight TypeScript integration ensure robust and maintainable backend logic.

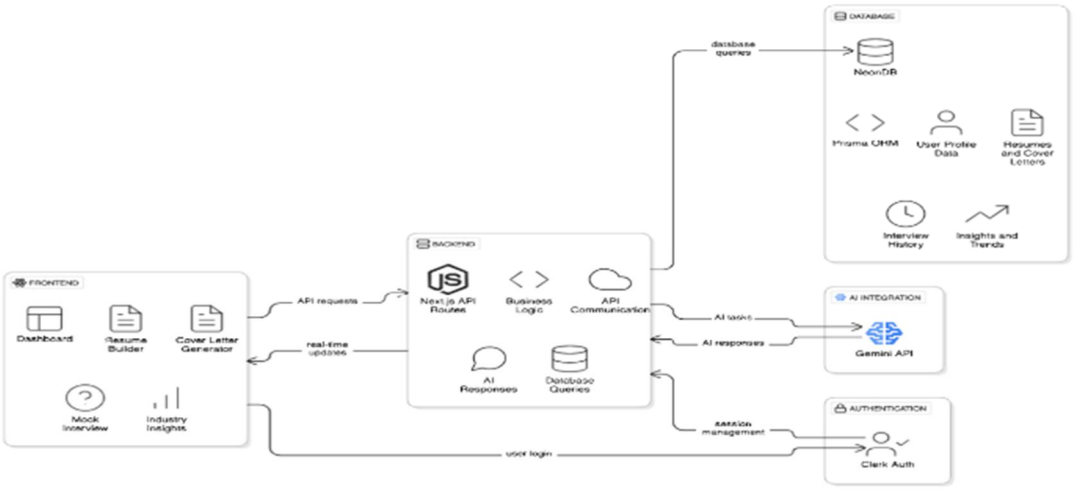


Fig. 1 Career Assistant Portal Architecture

B. User Onboarding and Profile Handling

After email-based authentication through Clerk, users are directed to a guided onboarding flow. This includes a profile completion form that captures essential attributes:

- Industry (e.g., IT, Healthcare, Finance)
- Specialization (e.g., Frontend Developer, Data Analyst)
- Years of Experience
- Technical and Soft Skills
- Short Professional Bio

This data is stored and forms the input for downstream AI modules. The system uses this profile to contextualize career recommendations, resume content, and mock interview questions, ensuring personalized user experiences.

C. Resume and Cover Letter Generation

The platform's resume builder allows users to generate ATS-optimized resumes by invoking Gemini API prompts based on their profile input. Users can select templates and customize content. The generated resume includes:

- Summary section
- Role-specific skill highlights
- Education and work history (where applicable)
- Achievements and certifications

The resume is editable, can be saved within the user's dashboard, and is downloadable in PDF format. The intelligent cover letter generator allows users to paste a job description. The system analyses it using semantic parsing and generates a tailored letter highlighting the candidate's matching strengths. Content structure follows professional HR standards (greeting, introduction, body, call to action, and signature).

D. Industry Insight Dashboard

The dashboard fetches and displays real-time labour market data, including:

- Top in-demand skills for the selected industry
- Salary trends across experience levels
- Recommended technologies or certifications

This data is updated weekly using Inngest, a background job orchestration platform. Inngest runs scheduled workflows that query industry APIs or scrape verified datasets, ensuring that users receive current insights every time they log in.

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E. Mock Interview Module

The system includes an interactive mock interview feature. Based on the user's selected role and skills, the system generates a set of 10 multiple-choice or short-answer questions per session. These are dynamically generated using Gemini API prompts that consider job-level difficulty and domain context.

After submission, user answers are assessed, and feedback is delivered. The platform tracks user performance across sessions, calculating progress trends and generating personalized improvement tips. This iterative feedback loop helps users self-assess and build interview confidence over time.

F. AI Integration and Matching Algorithm

The Gemini API is used across the system to generate human-like, personalized content. It powers the resume builder, cover letter generator, and mock interview feedback system. As Gemini is based on transformer-based deep learning models developed by Google, it offers high-quality natural language generation, enabling output that mimics expert writing.

A simple skill-matching algorithm is integrated to score how well a user's skills align with various job roles. It compares user-inputted keywords against a pre-curated database of job role requirements. Based on the overlap and weightage of critical skills, it outputs a percentage-based match score, guiding users to roles where they are best positioned for success.

IV. RESULTS AND ANALYSIS

The Smart Career Assistant Portal was evaluated using a representative sample of final-year engineering students. These participants were guided through the full system flow, beginning with Clerk-authenticated login, followed by profile completion, and interaction with each of the platform's modules, including the resume builder, cover letter generator, industry insight dashboard, and mock interview feature. Their input was collected and processed using integrated AI services, most notably the Gemini API and internal matching algorithms, to generate career-relevant outputs. The responses, preferences, and skill data gathered were analysed to measure the platform's ability to personalize recommendations and enhance job readiness.

The results demonstrate the potential of AI in transforming traditional career counselling into a personalized, dynamic, and data-driven experience. Through automated profiling and real-time content generation, the system efficiently analysed user inputs and returned structured, actionable insights. Below are the key analytical outcomes observed across multiple user sessions:

1) *Personalized Resume Generation:* The platform generated ATS-optimized resumes tailored to individual user profiles. Each resume was formatted with AI-crafted content that aligned with the user's domain, experience, and skills, reducing the effort traditionally required in resume writing and ensuring higher job application compatibility.
2) *Targeted Cover Letters:* By inputting a job description, users received cover letters specifically tailored to the listed requirements. The content emphasized relevant strengths and aligned the applicant's experience with the company's goals, offering highly contextualized outputs that saved time and increased personalization.
3) *Interview Readiness and Feedback:* The mock interview module provided ten domain-specific questions per session. AI evaluated user responses, provided real-time feedback, and tracked performance trends over repeated attempts. This iterative feedback process helped students gain confidence and identify areas for improvement.
4) *Industry Trends and Skill Demand:* Weekly-updated dashboards informed users of in-demand technologies, average salaries, and trending roles within their industry. This helped students stay informed and adapt their skillsets to match evolving labour market needs better.
5) *Skill Gap Analysis and Career Suggestions:* The platform utilized a simple matching algorithm to compare user profiles against predefined job roles. It provided each user with a match score and highlighted skill gaps, offering suggestions for certifications or tools to bridge these gaps and increase employability.

These results affirm the system's effectiveness in providing structured, real-time, and personalized career guidance. By combining intelligent content generation with dynamic labour market insights, the platform equips students with the tools needed to make informed decisions and succeed in a competitive job market.

V. ADVANTAGE AND APPLICATION

A. Technology Stack Benefit

The system utilizes a robust full-stack architecture combining React 19, Next.js 15, Tailwind CSS, Shadcn UI, NeonDB, and Prisma ORM. This setup enhances development efficiency, ensures scalable performance, and promotes maintainable code through component reusability and type-safe database access.

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It supports rapid development through modular design and reusable UI components, allowing for consistent styling and faster iteration cycles.
Additionally, server-side rendering in Next.js improves SEO and initial load times, which is essential for user engagement in web platforms.

B. Key Advantage

The integration of Prisma ORM with TypeScript provides compile-time safety and simplifies database interactions, while Next.js optimizes rendering and routing. This significantly reduces bugs, boosts performance, and enables fast deployment cycles.

C. Practical Application

This technology stack is ideal for real-time, user-focused applications such as AI-powered career guidance systems, intelligent resume builders, dynamic industry analytics dashboards, and personalized job-matching platforms.

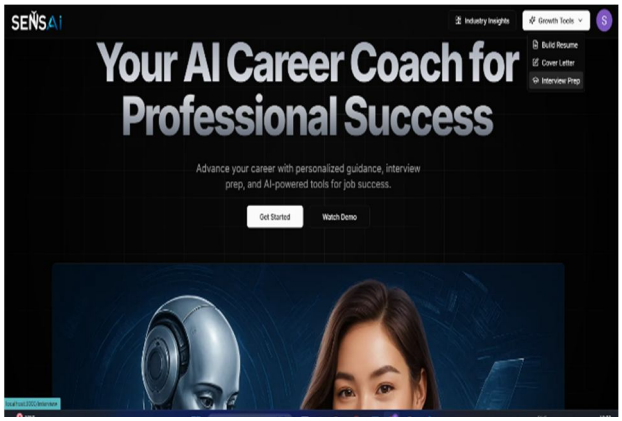


Fig. 1 Home Page with User Onboarding.

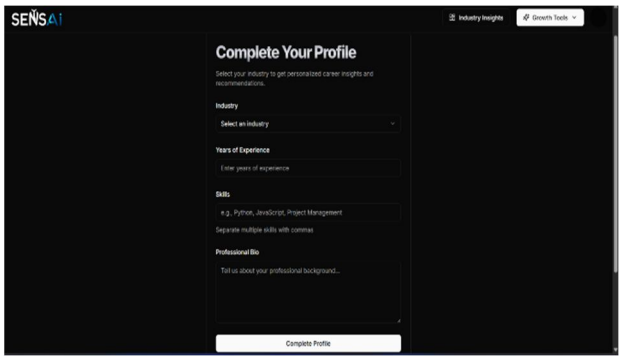


Fig. 3 Profile Page for Entering Skills, Experience, etc..

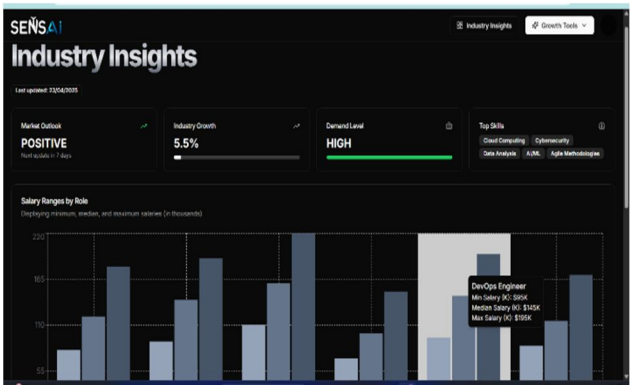


Fig. 4 Industry Insights Page displaying in-demand skills and salary trends.

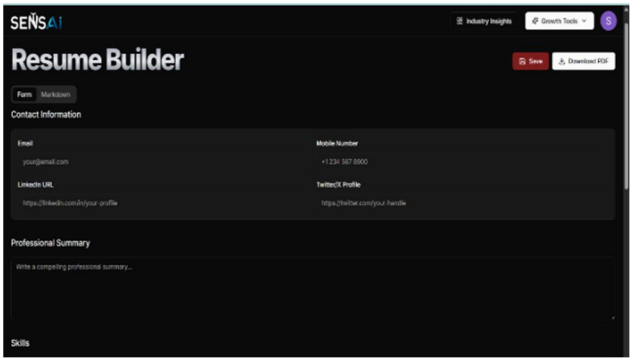


Fig. 5 Resume Builder Page generating ATS-optimized content.

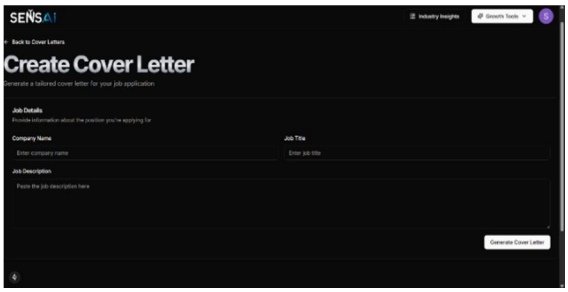


Fig. 6 Cover Letter Generation Page based on job descriptions.

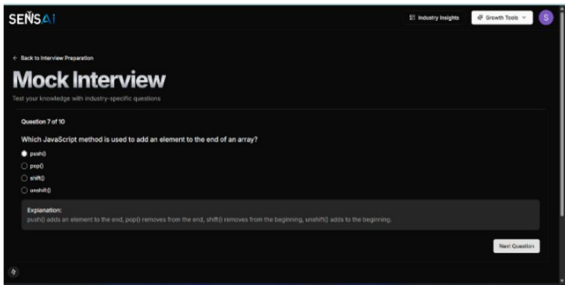


Fig. 7 Mock Interview Page with role-specific questions

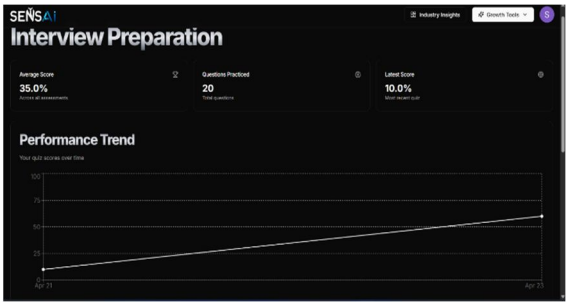


Fig. 8 Performance Graph Page showing user progress

VI. FUTURE WORK

To enhance the functionality, adaptability, and practical impact of the proposed Smart Career Assistant Portal, several future enhancements are proposed:

1) *Voice-Enabled Mock Interviews:* Incorporating voice recognition will enable users to simulate real interview experiences and receive real-time feedback on speech clarity, tone, and delivery.
2) *Mobile Application Development*: A mobile version of the platform will increase accessibility, allowing users to manage profiles, access insights, and receive updates anytime, anywhere.

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3) *Multi-Language Support*: To ensure broader reach and inclusivity, the platform will support multiple regional and international languages for UI and AI-generated content.
4) *Skill Gap Certification Mapping:* The system will recommend online certifications based on skill gaps identified in user profiles, with integrated links to platforms like Coursera, edX, and Udemy.
5) *Advanced Analytics and Insights Dashboard:* A more robust analytics dashboard will be introduced to provide users with insights on industry trends, skill demands, and real-time data visualization, enabling better decision-making for career advancement.

These enhancements keep the platform adaptive and relevant to diverse career needs in an evolving job market.

VII. CONCLUSIONS

The Smart Career Assistant Portal presented in this paper demonstrates the effectiveness of integrating artificial intelligence with real-time labour market analytics to enhance career readiness among students and early professionals. Unlike traditional guidance methods, this system personalizes the user experience by leveraging technologies such as Next.js, Prisma ORM, NeonDB, Gemini API, and Inngest. It enables secure onboarding, profile completion, and access to tools including an ATS-optimized resume builder, intelligent cover letter generator, industry insights dashboard, and mock interview module. The AI adapts content to each user's profile, offering tailored outputs and actionable suggestions based on individual inputs and preferences. Pilot testing demonstrated increased user satisfaction, faster resume preparation, and better alignment with job applications. By identifying skill gaps and updating trends weekly, the system supports both short-term readiness and long-term career growth. This study affirms the role of AI in bridging the gap between academic learning and modern employability in a dynamic job market.

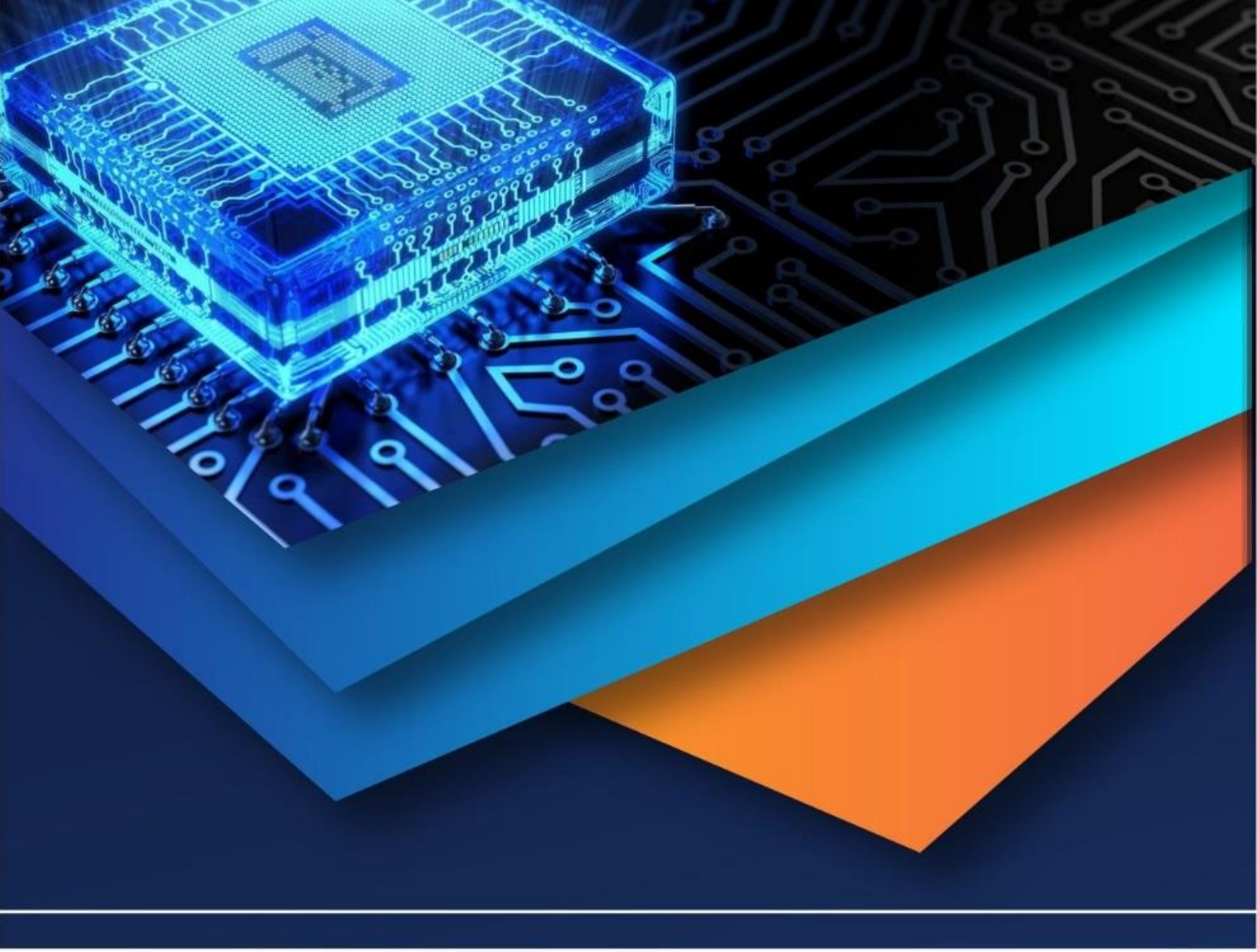
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