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FINSIGHT: An AI-Powered Personalized Finance Platform

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Abstract: ***Managing personal finances in today's digital age has be-come increasingly complex, with individuals juggling multiple income streams, UPI-based transactions, and diverse spending habits. Existing tools often demand manual effort and fail to provide the kind of real-time, intelligent insights that modern users need. FinSight is a web-based personal finance management platform that addresses these challenges by combining AI-driven automation with an intuitive user experience. Built using Next.js, Tailwind CSS, Supabase and Prisma ORM, the platform offers features such as automated budget tracking, receipt scanning powered by the Gemini API, personalized financial dashboards, and monthly AI-generated reports delivered via email. A standout innovation in FinSight is its SMS-Based Transaction Track-ing system, designed specifically for the Indian digital payments eco-system. When users make payments through UPI applications such as Google Pay, PhonePe or Paytm, their banks send confirmation SMS alerts. FinSight's Android background service reads these messages with explicit user consent extracts transaction details including amount, merchant, date, and reference ID, and logs them automatical-ly. This eliminates manual data entry entirely and makes real-time ex-pense tracking effortless. Altogether, FinSight offers a scalable, priva-cy-friendly, and truly helpful way to manage your money that works with the payment systems you already use.***

Keywords: AI Finance, personal budgeting, receipt scanning, ex-pense tracking, SMS transaction tracking, UPI payments, Next.js, Supabase, Prisma, Gemini API.

I. INTRODUCTION

Managing personal finances has grown increasingly difficult in today's tech-driven environment. Different revenue streams, digital transactions, and a range of spending patterns all contribute to this complexity. Many people find it difficult to keep track of their spending, stick to a budget, and appropriately assess their financial situation. Smart technologies that make financial tracking easier, offer valuable insights, and guarantee data security are be-coming more and more in demand as a solution to these problems. FinSight is a platform for managing personal finances. AI is used to simplify financial analysis, budgeting, and spending tracking.

It provides a secure and easy-to-use experience and is built with Next.js, Tailwind CSS, Supabase, and Prisma ORM. The ap-plication employs the Google Generative AI API to automate re-ceipt scanning and offers Clerk authentication for safe access to numerous accounts. It efficiently extracts information and catego-rizes it. 1Additionally, FinSight provides live financial visualization through interactive graphs, along with email notification and AI insights that promote financial management. A unique feature of FinSight is its SMS-Based Transaction Tracking system. When people use UPI apps like Google Pay, PhonePe, or Paytm to pay, their banks send them con-firmation SMS messages. With the user's permission, Fin-Sight reads these SMS alerts and automatically saves trans-action details like the amount, name, date, and reference ID. FinSight is especially helpful for people in India who use digital payments, where UPI has become the most popular way to pay. This is because it automates data entry, so users don't have to do it by hand.

The main goals of this initiative are:

1) To create a secure and interactive platform for monitoring income and expenses.
2) To automate the extraction and categorization of receipt data using the Google Generative AI API.
3) To provide interactive charts and dashboards that show changing financial data.
4) To give AI-powered insights and automatic email alerts for keeping an eye on the budget.
5) To set up SMS-based UPI transaction tracking so that expenses can be tracked in real time with no effort.

II. LITERATURE SURVEY

With an emphasis on automation, real-time visualization, and safe data handling, the literature review investigates re-search on AI-powered financial management systems. AI-driven expense tracking, receipt scanning, and cloud-based architectures that improve user experience and financial de-cision-making are highlighted in recent studies.

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Building on these discoveries, FinSight offers a clever, dependable, and user-focused finance management solution by fusing intelli-gent analytics, secure authentication, and scalable architec-ture.

1) Jadhav et al. proposed Budget Buddy, an AI-powered per-sonal finance tracking system that automates expense classi-fication and receipt scanning. It provides real-time financial visualization to users [1]. The system reduces manual effort and improves ex-pense monitoring efficiency. However, it faces chal-lenges with scalability, data validation, and secure han-dling of multiple users. These issues limit its effective-ness in large-scale or multi-account situations.

2) Aishwarya et al. presented an AI Expense Tracker that uses natural language processing and machine learning algorithms to automatically identify spending patterns and categorize expenses [2]. The system focus-es on data-driven insights to help improve budgeting decisions and financial literacy. However, the solution lacks interactive visualiza-tion features and does not include strong authentication mechanisms, which may impact data security and over-all usability.

3) Patil et al. introduced Spend Analyzer, a machine-learning-based application designed to analyze and predict user spending behavior through graphical expense representations and report generation features [3]. While the system supports budget management and expense visualization, it lacks AI-driven automated data extraction, cloud scalability, and strong input validation mechanisms. This limits its flexibility and automation capabilities.

4) Agarwal et al. proposed an AI-powered personal fi-nance assistant that aims to improve financial literacy and management. It provides personalized insights, proactive notifications, and adaptive recommendations based on user behavior and financial goals [4]. The study points out the limitations of static budgeting tools and generic financial advice. It stresses the im-portance of intelligent assistants in boosting user engage-ment and making better long-term financial decisions.

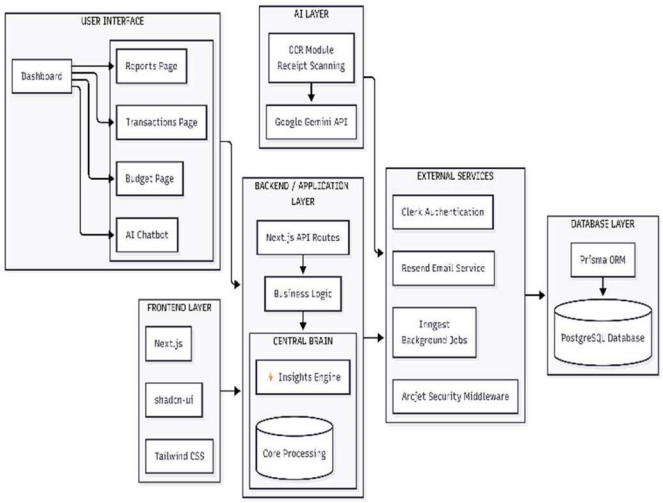
5) Deepthi et al. introduced an AI-powered finance man-agement platform that combines the latest AI and machine learning techniques in a cloud-based setup. This supports real-time data intake, expense tracking, budgeting, portfo-lio optimization, and predictive decision-making [5]. The study divides existing solutions into advisory systems, explainable risk models, and data-driven analytics. It emphasizes ethical use, personalization, privacy, and the need for scalable event-driven workflows. The paper also includes a workflow diagram for an integrated platform that compares representative systems and high-lights the significance of explainability and trust for end users.

Web App	Key Feature	Limitations
1. Walnut	• Uses SMS to automati-cally track spending. • Has an offline bank bal-ance display. • A straightforward mo-bile user interface.	• Fewer analytics tools. • No tools for set-ting goals. • The web-based ver-sion is absent.
2. Money View	• Keeps track of and classi-fies SMS expenditures. • Produces graphical charts. • Shows insights and a credit score.	• Has tracking permissions and advertisements. Is-sues Sync delays on sometimes. • Data privacy issues.
3. Good-budget	• A manual budgeting sys-tem that uses envelopes. • Syncing in the cloud between de-vices. • An interface that is easy to use and doesn't have ads.	• No AI or automa-tion features. • Needs data to be entered by hand. • Few tools for visualiz-ing.
4. Wally	• Support for multiple currencies and reminders for bills. • Scanning receipts and backing them up in the cloud. • Keeps track of money that is shared.	• The interface is cluttered and lacks predictive insights. • Occasionally, sync-ing problems.
5. Mint	• Offers bill reminders and credit score moni-toring. • Automates budgeting and cost classification.	• Limited customiza-tion choices. • Only operates in the United States and Canada.
6. Money Manager	• Graphs that show spending trends. • App access that re-quires a password.	• Data entering must be done by hand. • There is no AI automa-tion. • Just basic analytics.
7. Spen-dee	• Support for several cur-rencies and shared family wallets. • Vibrant cost charts. • Personalized track-ing categories	• The majority of au-tomation is locked in the premium edition. • Problems with ac-count syncing. • Support for basic AI

According to the researched literature, most current solu-tions focus on basic spending monitoring and visualiza-tion. They do not offer scalable cloud-based systems, deep AI integration, or secure authentication systems [1], [2], [3]. These limitations show the need for a smarter, safer, and more flexible personal finance.

III. PROPOSED METHODOLOGY

A. *System Architecture*



The FinSight platform has five distinct architectural lay-ers, each handling a specific set of functions. These lay-ers connect with various external services to create a se-cure, modular, and scalable financial management eco-system.

1) User Interface Layer: The UI layer is the main point where users interact with the platform. It includes four main pages: the Dashboard, Transactions, Budget, and Reports. There is also an AI-powered Chatbot interface that uses the Gemini API. The Dashboard provides a summary of the user's financial status through charts and recent activities. The Transactions page keeps a detailed record of all in-come and expenses. The Budget page allows users to set and track monthly spending limits by category. The Re-ports page generates AI-driven weekly and monthly fi-nancial summaries.

2) Frontend Layer: The frontend handles UI rendering and client-side logic. It is built with Next.js, using the App Router for managing server-side and client-side components, Tailwind CSS for responsive styling, and Shadcn UI for accessible, pre-built components. This setup ensures a fast, visually consistent experience across devices. Receipt data collected in this layer is sent to the backend processing pipeline.

3) Backend and Application Layer: The backend is the main processing engine of the system. Next.js API Routes enable communication between the frontend and business logic components, which manage financial op-erations like creating transactions, enforcing budgets, and handling accounts. The Insights Engine is central to this layer. It processes financial data, initiates AI analysis, sends alerts, and coordinates output to the UI and notifi-cation systems. Two specialized AI modules operate here: the Google Gemini API module, which provides personalized finan-cial insights, spending reports, and natural language re-sponses; and the OCR Module, which uses optical char-acter recognition and natural language processing to ex-tract structured transaction details such as amount, date, merchant name, and category from uploaded receipt im ages. The SMS Reader Module, an Android background service, in-dependently parses UPI transaction alerts received via bank SMS notifications and sends the extracted data to the Insights Engine for categorization.

4) Database Layer: All persistent data is managed through Prisma ORM, connected to a PostgreSQL database hosted on Supabase. Prisma maintains schema correctness, supports type-safe querying, and enables atomic transactions, which are critical for financial data to avoid balance inconsistencies. Both the business logic components and Inngest background jobs interact with this layer for reading and writing operations that support dashboards and report generation.

5) External Services: The architecture uses four external services to improve security and operational reliability. Clerk manages user au-thentication, session management, and multi-factor authentication. Arcjet Security Middleware enforces rate limiting and bot detection for all critical API endpoints. The Resend Email Service, based on React Email templates, sends transactional communications, includ-ing budget alerts and monthly financial reports. Inngest oversees the scheduling and execution of back-ground jobs such as recurring transaction processing, cron-based report generation, and event-driven budget notifications.

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B. Technological Stack

Category	Technology	Purpose
Frontend	Next.js (App Router), Re-act.js	Core web framework, Server/Client components.
Styling	Tailwind CSS, Shadcn UI	A CSS framework and com-ponent library that prioritiz-es utility for quick design and development.
Authentication	Clerk	Full-stack user authentication, management, and session con-trol.
AI/ML	Gemini API (1.5 Flash Model)	Used to generate financial in-sights and do multi-modal activ-ities, such as image analysis for scanning receipts
Security	Arcjet	Critical API end-points are protected from common at-tacks, Arcjet Rate-limiting, and Bot De-tection.
Background Jobs	Inngest	Manages recurring background tasks, scheduling (cron jobs), and event pro-cessing
Email	Resend/React Email	Using React compo-nents to send trans-actional emails (monthly reports, budget alerts).
Database	PostgreSQL + Prisma ORM	Schema management, query optimization, and storing relational data
Mobile Module	Android SMS Reader	Background SMS lis-tening.

C. Key Technological Components

Component	Function
Prisma Transactions	Guarantees atomic database opera-tions, which are essential for financial data and can either be successful or unsuccessful. used to initiate a new transaction and update an account balance at the same time.
Next.js Server Actions	The complete API layer is repre-sented by Next.js Server Actions, which uses secure backend logic to handle form submissions and data modifications straight from React components.
Clerk Mid-dleware	By using secured routes in Next.js to reroute unauthorized users to the sign in page, Clerk Middleware secures the application.

Zod / React Hook Form	React/Zod Hook Form offers effec-tive state management for all user inputs as well as strong, schema-based form validation.
Recharts	The interactive and adaptable visu-alizations (pie charts for spending breakdown, bar charts for transac-tion overview) were created using Recharts.
SMS Reader Module	An Android background service that listens for bank SMS alerts, uses regex and NLP parsing to get the data, and sends it to the backend through secure API calls.

D. System Workflow

The system is defined by its data flow and automated back-ground tasks:

Data Creation Flow

1) Authorization: To confirm the user's identity through Clerk, all crucial operations begin with an authorization check (await auth()/await checkUser()).

2) Receipt Scanning:

- A picture is uploaded to the form by the user.
- The image and a prompt to extract structured JSON data (amount, date, description, and category) are sent to the Gemini API by a Server Action (scanReceipt).
- The fields on the transaction form are automatically filled up using the re-turned JSON data.

3) Transaction Submission:

- It launches the createTransaction Serv-er Action.
- Arcjet determines whether or not the us-er has gone over the daily transaction rate cap.
- The new transaction record is created.
- The corresponding account balance is updated by adding income and reduc-ing expenses.
- To immediately reflect the updated da-ta, the pertinent application pages (/dashboard, /account/[id]) undergo re-validation.

4) SMS-Based Transaction Capture

- Whenever there is a UPI transaction made through any application (Google Pay, PhonePe, Paytm, etc.), an SMS notification is sent by the bank to the registered mobile number of the user.
- The FinSight Background Android SMS Listener (Permission READ_SMS) listens for the incoming SMS and uses the following parsing sequence.

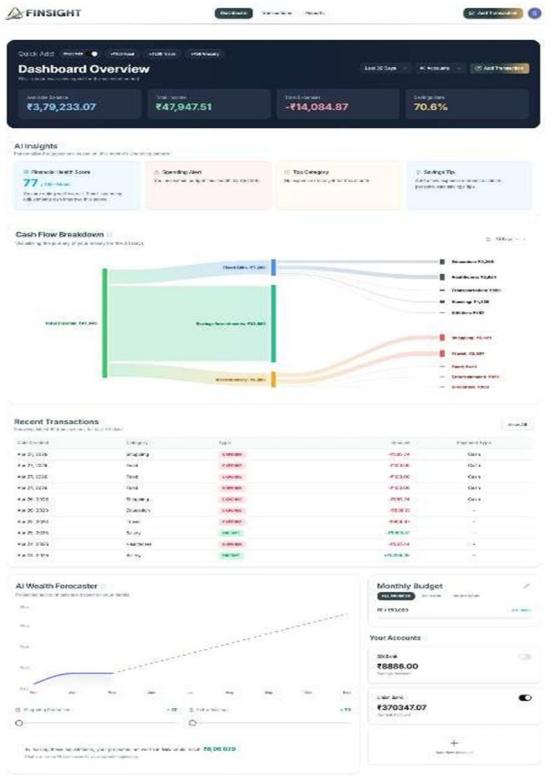
E. Automated Background Tasks:

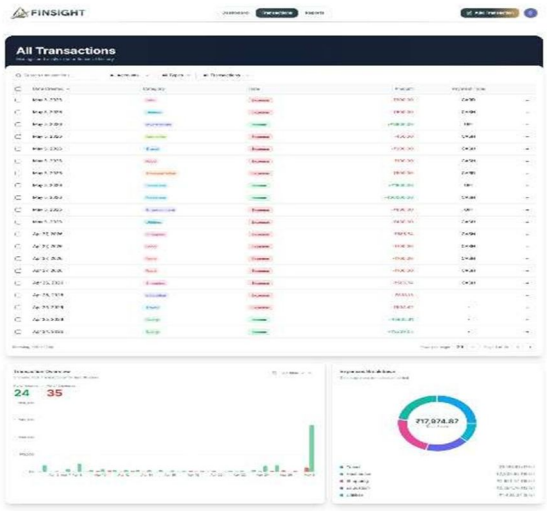
Cron Job	Schedule	Purpose
Check Budget Alert	Runs every few hours.	Determines whether a user's monthly costs have above 80% of their allocated budget. An email is sent via Resend if it is true and no alert has been sent this month.
Trigger Recur-ring Transac-tion	Daily	Checks for any recurring transactions(isRecurring :true) with a past-due or next- recurring date. The account balance is up-dated and a new, non-recurring transaction is made for each.
Generate Monthly Re-ports	1st of every month	Determines the previous month's total revenue, total expenses, and breakdown of expenses. creates a customized Financial Insight sum-mary using the Gemini API and sends the user the complete report via email.

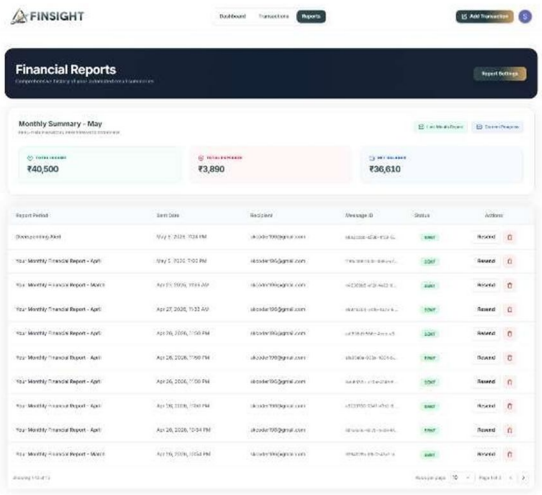
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F. Proposed System UI









IV. CONCLUSION

FinSight combines artificial intelligence and modern digital technology to offer a holistic approach to the change of personal finance management. Processes like budgeting, track-ing expenses, data extraction from receipts, and UPI transactions via SMS can be automated to increase efficiency and decrease human work. The software's visual interfaces, machine learn-ing algorithms for data analysis, and secure authentication procedures enable users to utilize it safely and confidently to make wise financial decisions. Because UPI technology is spreading so quickly in India, the suggested SMS-Based Transaction Tracking component is often one of the most significant advancements.

The truth is that each transaction is examined and transformed into a useful insight that will enhance each person's unique financial habits and behaviour. Such capabilities as automatic reporting and analytics, as well as the module-based architecture, ensure uninterrupted data processing and system reliability. In total, the described platform ensures a high level of ef-fectiveness and innovation in finance manage-ment, while automation, scalability, and data security are the main concerns of the system. The above approach demonstrates that AI-based solutions can totally revolutionize the way people manage, assess, and improve their finances by transforming FinSight from being a mere financial tracker to an AI-based financial management assistant.

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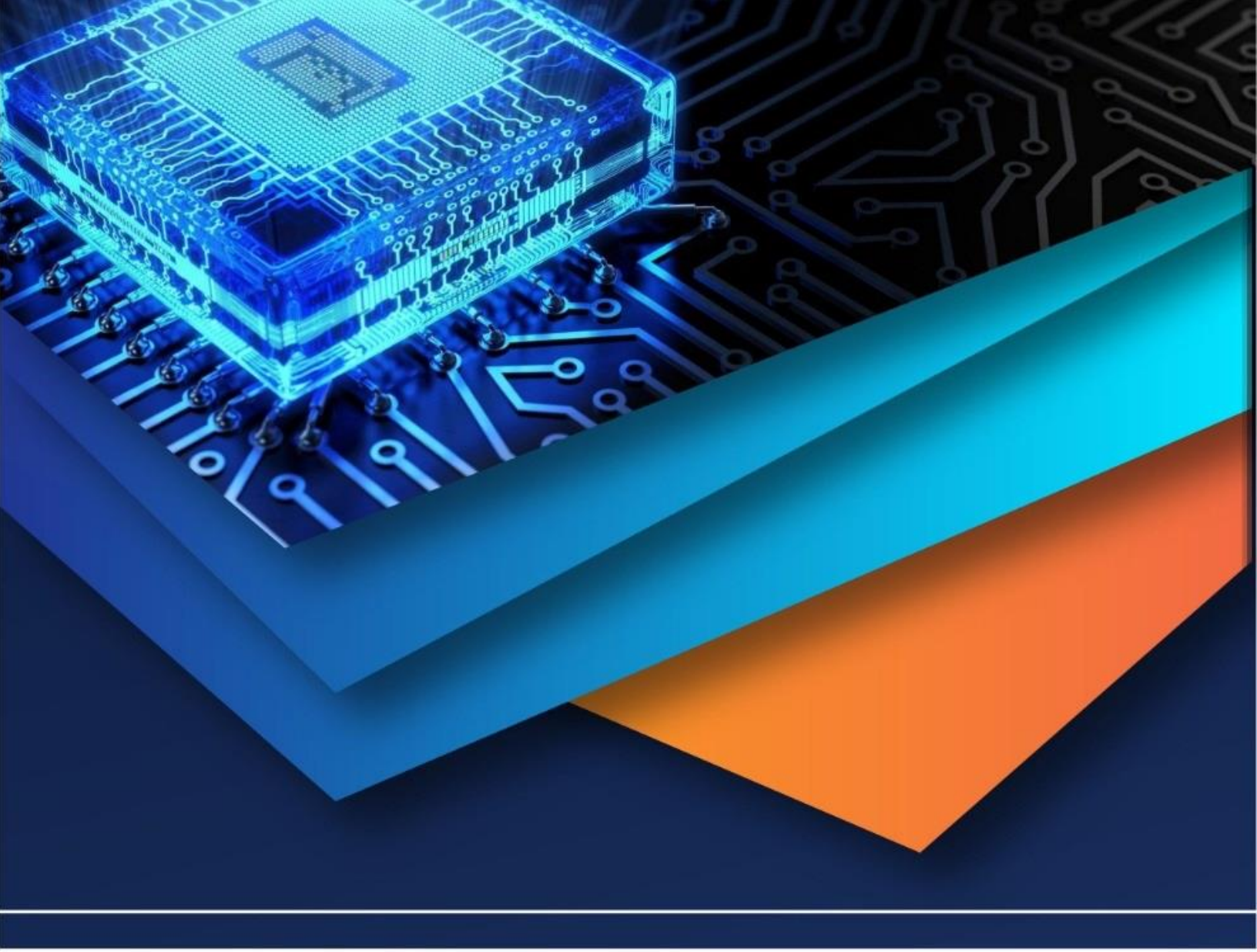
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