iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** I **Month of publication:** January 2025

DOI: https://doi.org/10.22214/ijraset.2025.66638

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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 13 Issue I Jan 2025- Available at www.ijraset.com

DigiSort: Smart Asset Organization

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Abstract: ***The exponential growth of digital files in recent years has posed significant challenges in managing, organizing, and retrieving data efficiently. This paper introduces the Digital Asset Organizer (DAO), a robust solution designed to address these challenges by leveraging advanced categorization techniques. DAO intelligently classifies files into "Basic" and "Advanced" categories through multi-criteria evaluation, including file content analysis, size thresholds, and file extensions. By integrating a seamless web interface, users can upload files, specify organizational filters, and download categorized assets in compressed ZIP formats, enhancing portability and storage management. DAO's classification system incorporates keyword detection and metadata analysis, ensuring accuracy and adaptability across diverse file types. Its responsive design further allows users to access and organize assets from any device, streamlining workflows and reducing digital clutter. This innovative research represents a significant step toward simplifying digital asset management and lays a foundation for scalable and intelligent file handling systems.***

I. INTRODUCTION

The explosion of digital data in recent years has resulted in an unprecedented increase in the number of files stored by individuals and organizations. It so happens in a natural world like when a person is working on a system, he/she might download hundreds/thousands of files into the system and all the downloaded files belonging to the different categories goes into the downloads folder. It often becomes tedious for the user to categorize the files depending on a particular subject. It has become increasingly difficult to manage such a wide range of digital assets, from code files and documents to media assets and data sheets. The lack of an efficient organization system often leads to cluttered storage, time-consuming searches, and potential data loss, which significantly hampers productivity and accessibility. Traditional file management tools lack the intelligence to classify and organize files dynamically, leaving users with a tedious, manual process. Hence, to overcome this difficulty, this paper introduces the world to an application named as **Digital Asset Organizer** (DAO) that reduces the job of a user.

A **Digital Asset Organizer** is a tool or system designed to streamline the management, storage, categorization, retrieval, and utilization of digital assets such as images, videos, documents, audio files, and other multimedia resources. It is an essential solution for individuals, teams, and organizations dealing with large volumes of digital content, ensuring assets are easily accessible, secure, and organized for optimal productivity.

This paper presents the Digital Asset Organizer (DAO), an advanced tool designed to tackle these challenges through intelligent categorization, organization, and retrieval mechanisms. The DAO system operates by analyzing files based on three key criteria: content, size, and extensions. Files are categorized into "Basic" and "Advanced" types using keyword analysis, predefined advanced file extensions, and size thresholds, enabling users to prioritize and organize their assets effectively. For example, programming files like .py, .cpp, and .java or files with critical information such as .pdf and .csv are identified as "Advanced," while simpler text or smaller files are classified as "Basic." This multi-layered approach ensures that the categorization is not only accurate but also adaptable to a wide range of use cases.One of the standout features of DAO is its user-friendly web interface, which simplifies file management. It allows users to upload individual files or directories, specify folder and keyword names, and categorize files before organizing them. A unique aspect of DAO is its ability to compress selected files into a downloadable ZIP folder, streamlining file storage and sharing. By integrating advanced algorithms with a modern, responsive design, DAO ensures compatibility across devices, providing users with unparalleled flexibility and convenience. In addition to enhancing file organization, DAO addresses scalability, making it suitable for both individual users and enterprises handling large datasets. This project not only offers an immediate solution for managing digital clutter but also lays the groundwork for future advancements in intelligent file management systems. With its innovative approach to classification and organization, DAO redefines how users interact with their digital assets, making the process more efficient, secure, and accessible.

Implementing DAO can provide numerous benefits including Improved Efficiency, Enhanced Collaboration, Asset Reusability, Scalability and Flexibility and Data Security

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II. LITERATURE REVIEW

The rapid growth of digital content across personal, professional, and organizational contexts has led to an increasing demand for efficient and effective digital asset organization tools. Digital assets—such as documents, images, videos, and other multimedia files—are critical resources for individuals and businesses alike, yet managing them presents unique challenges. This literature review explores existing research, methodologies, and technologies related to digital asset organization, highlighting key trends, limitations, and opportunities in this domain.

The author of [1] Critical Assessment of Issues and Benefits of Digital Asset Management Nawaf H. Alqahtani1 & Tahani H. Alqahtani2 discusses the key issues in digital asset management as well as key benefits of digital asset management. The authors explore how DAM has evolved from simple file storage systems to comprehensive solutions for organizing, managing, and distributing digital assets within businesses. Furthermore, it highlights the benefits of DAM, including enhanced collaboration, time-saving processes, and improved brand image. It does not consider the different kinds of DAM but covers three main ideas: issues in DAM, benefits of digital asset management and the development of recommendations for the management of the digital assets.

The authors of Digital Asset Management Fulvio Re Cecconi, Mario Claudio Dejaco, Nicola Moretti, Antonino Mannino and Juan Diego Blanco Cadena presents a cost-effective method to improve maintenance management operations by automating them. It proposed three-tier framework within which the reengineering of business processes takes place.it also demonstrates how Digital AssetManagement processes can be developed according to a data-driven and service-driven approach And achieves positive results in the DAM implementation processes.

Digital Asset Management and Document Management provides a general overview of document management system (DMS) and digital asset management (DAM). Shailesh Kumar Shivakumar[5] proposedthat DAM is the end-to-end lifecycle management of digital assets, including asset ingestion, asset tagging, asset versioning, asset storage, and asset distribution. Main objectives of a DAM system include providing an asset management platform for optimal asset access, providing asset flows, serving various asset renditions, tagging assets, and supporting content systems for creating a consistent brand experience. presented a detailed case study for a document management solution for a banking portal. Main objectives of a DAM system include providing an asset management platform for optimal asset access, providing asset flows, serving various asset renditions, tagging assets, and supporting content systems for creating a consistent brand experience.

Information management for digital asset development and delivery Amelia Celoza **[1]** As a result of the research, 13 processes, 19 enablers, and 20 barriers were identified related to the development and delivery of digital assets in the architecture, engineering, construction, and facility management (AEC/FM) industries. Research has shown that many existing studies do not evaluate the information system required to produce digital assets that support physical assets throughout their lifecycle but rather focus on one technology application. Considering the complex nature of the information systems in a project organization, future research should focus on how information management-related processes may evolve. Ultimately, this work is an attempt to synthesize processes, enablers, and barriers that contribute to the development and delivery of digital assets, a critical product to unlock the value of a project during its life cycle.

Digital Asset Management Rishabh Tripathi1, Rudrendra Bahadur Singh2, Shreyas Srivastava3, Diksha Sonkar4, Ayushi Srivastava Implemented an application that enables users to easily control assets. Using a digital asset management system, companies can organize, share, secure, measure, and execute digital files comprised of a digital asset library during creative and marketing campaigns. The use of digital asset management reduces the problem of managing digital assets in a single location without compromising the quality of data, as well as sharing metadata with third parties that is reliable.

A Blockchain-based Educational Digital Assets Management System Junqing Li1,4

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A Blockchain-based Educational Digital Assets Management System

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Using blockchain 3.0 technology systems, this paper proposes an architectural framework for managing educational digital assets.

The data created in the learning process by students in and out of class is converted into educational digital assets, while the courseware and experience data generated by teachers are consolidated and stored on the blockchain in the right way. With a variety of heterogeneous data in digital assets, the system can analyze the development status of school users and teach students according to their aptitude and different personalities.

Digital Asset Management: A Lowdown on Intricacies of Digital Rights and Permissions

Venkata Naga Satya Surendra ChimakurthiThe intricacy, functionality, semantics, and functionality of DAM classes are the main topics of this document. Regulating records, creating a tested operational framework for digital asset management and security, and investigating practical ways for end users to locate, monitor, and recover digital assets are all examples of digital asset management standards. One notable characteristic that sets Digital Asset Management (DAM) software apart is its ability to build and maintain databases and frequently assist businesses in cost-effectively organizing their rich assets. The methodology employed focuses on evaluating conventional cataloging techniques and leveraging advanced technologies such as speech recognition, conceptual analysis, and metadata indexing to ensure efficient digital asset management. Additionally, the study highlights the integration of AI and machine learning for intelligent tagging, cross-referencing, and enhancing user accessibility in DAM systems.

A blockchain-based DAM system for access management of digital assets in the metaverse is proposed by the journal of [2] using smart contracts, the InterPlanetary File System (IPFS), and multi-layer encryption techniques. With no presumptions about participant confidence, this design offers a wide range of advanced security features, including resistance against data manipulation and leaking, and does away with the need for intermediaries. Furthermore, immutability, traceability, and transparency of information are provided to the system by utilizing important blockchain capabilities. A decentralized application that functions as a digital asset marketplace is constructed utilizing the suggested DAM framework in order to demonstrate the design's viability. According to experimental findings, the framework is more affordable than current platforms while maximizing automation and integrating cutting-edge security measures.

The security of digital assets, or data with their right to use (e.g., authority, ownership, fingerprints, etc.), was suggested by the author [3]. However, when it comes to handling multimedia data and being attacked, the blockchain's security mechanism is more vulnerable. Data integrity and multimedia data security are still difficult tasks. Multimedia data, on the other hand, could include important personal data. To enable the use and analysis of multimedia digital assets in the decentralized system without the leaking of personal information, more research is required in the area of privacy-preserving multimedia data management.

A new digital asset management platform called DAM-Chain with Transaction-based Access Control (TBAC) that combines blockchain technology and the distribution ABAC concept was introduced by [4]. The blockchain's transactions work as a verifiable and traceable medium of access request procedure, and the ABAC offers a variety of configurable authorization procedures for digital assets escrowed into the blockchain. The four transaction types—subject registration, object escrowing and publication, access request, and grant—describe the TBAC access control process and offer the algorithms for these transactions. This platform may facilitate verifiable and transparent access authorization procedures in an open decentralized environment, as well as flexible and varied permission management, by leveraging the advantages of both ABAC and blockchain.

Karol Król's paper [7] explores Generation Z's attitudes, understanding, and worries about digital assets like cryptocurrencies and non-fungible tokens (NFTs). It draws attention to how underrepresented Generation Z's opinions are in expert literature, which mostly focuses on market opportunities and difficulties as perceived by analysts and investors. Using a quantitative survey methodology, the authors collected information from 387 respondents. Their familiarity, affiliations, and opinions regarding digital assets are captured in the study. It highlights obstacles such as a lack of legislative frameworks, uncertainty regarding the intangible nature of digital assets, and inadequate expertise. The results point to a lack of knowledge and confidence in digital ecosystems, providing guidance for media narratives and tactics aimed at improving this group's interaction with digital resources.

Due to the quick expansion of digital materials, the authors, Martyn Jessop, [9], emphasize the growing significance of digital asset management (DAM) in the cultural heritage field. Their effort is centered on creating a curriculum that will give professionals the tools they need to manage, curate, and preserve digital assets. Including modules on digital preservation, metadata theory, and digital repositories, the program's extensive curriculum places a strong emphasis on hands-on learning through internships and real-world case studies. In order to bridge the skills gap in digital asset management, the authors support a focused educational approach that develops students' critical and reflective thinking skills, which will ultimately help them manage digital resources effectively in a variety of professional settings.

The review highlighted best practices and typical hazards in asset management and metadata integration by consulting pertinent case studies. It also includes a comparison of asset management tactics from various industries. Considering the literature review the consequences can be seen below:

Redundant Data:
Incomplete/Inaccurate Data:
Language Issues:
Based on the study a graph presents the data issues ranked by importance level for asset management as per the case study, with the most impactful issues at the top (Figure 1). This ranking is designed to help prioritize actions and focus on the most significant areas for improvement in asset management practices.

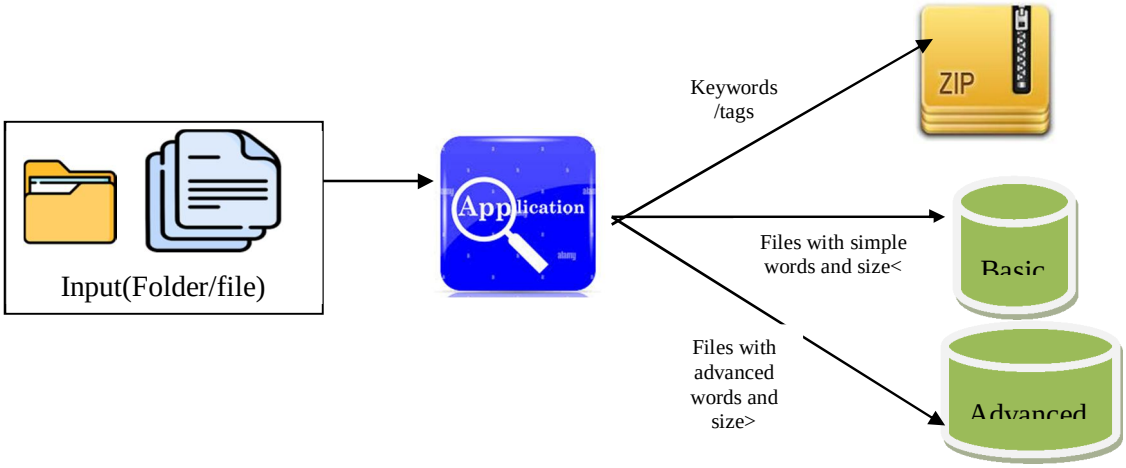
III. METHODOLOGY

A. *Data Analysis*

Data analysis plays a crucial role in the development and optimization of a digital asset organizer, enabling efficient management and retrieval of digital resources. By examining metadata such as file names, types, creation dates, size and tags, as well as user interaction data like search queries and access patterns, insights can be gained into how assets are used and organized. Analytical techniques help identify trends in user behavior, improve search efficiency, and optimize categorization systems. For instance, analyzing search queries can highlight common keywords and reveal gaps in metadata tagging, while storage usage data can inform strategies for scalability. Despite challenges such as managing large datasets and ensuring privacy, data analysis opens opportunities to refine digital asset organizers, ensuring they remain responsive to user needs and scalable for future growth.

B. *System Architecture*

Figure 1 shows the system architecture of the proposed system. Initially, the files or folders available in the local system are fed to the application. The application then asks the user to enter keywords or metadata, based on which the files will be categorized and compressed into zip folder.
Also, the application is configured with categorizing the files into basic or advanced based on the type of file, type of words, and the size of file. If files are concerned with programming or contains any complicated words and the file size is greater than , it is categorized as advanced. All other types are categorized as basic. All the files organized can be given a new filename.



C. *Modules*

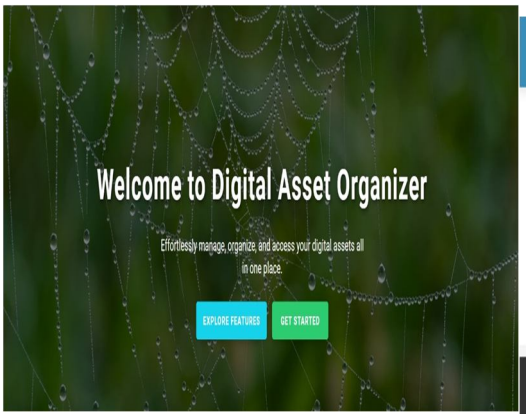
The proposed system is built using multiple modules:

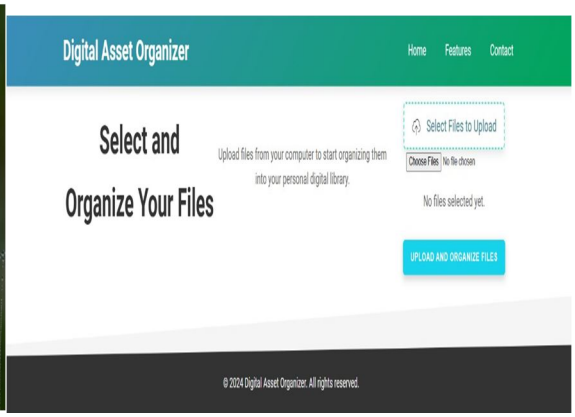
1) *File Upload Module:* This module enables users to upload digital assets such as images, documents, and videos through a user-friendly web interface. It validates file types and sizes to ensure compatibility and security. Once uploaded, the files are automatically categorized based on predefined criteria, preparing them for further processing.
2) *Metadata Management Module:* This module generates and manages metadata for the uploaded assets. It extracts key attributes such as file type, size, and creation date while allowing users to add custom tags. The system supports standard metadata frameworks to ensure consistency and improve asset discoverability across the platform.
3) *Search and Retrieval Module:* This module facilitates efficient retrieval of digital assets using advanced search functionalities. It employs AI-powered algorithms to enable semantic search, keyword matching, and filtering based on file type, tags, and upload dates. The module ensures quick and accurate results, even in large datasets.

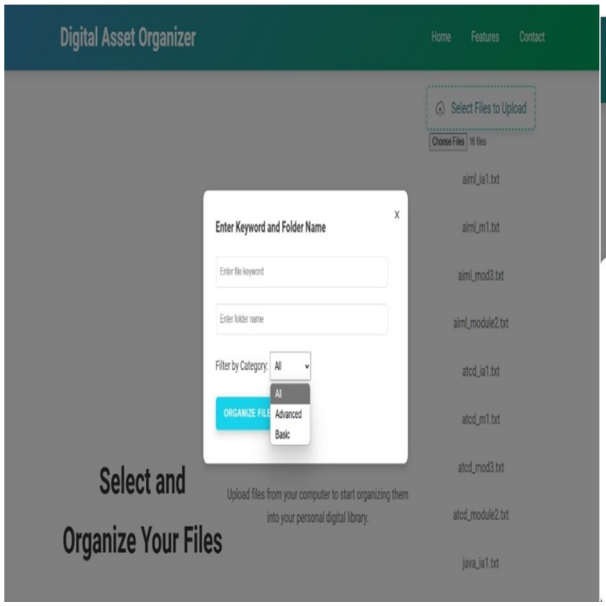
4) *File Organization Module:* This module organizes digital assets into folders, categories, or tags based on user preferences or predefined rules. It supports drag-and-drop functionality for easy reorganization and maintains a logical structure for efficient asset management.
5) *Security and Access Control Module: This* module ensures that only authorized users can access the digital assets. It provides features like user authentication, role-based access controls, and encryption for sensitive data. Additionally, it maintains an activity log to track user actions on the platform.
6) *User Interface Module:* This module provides a clean, responsive, and intuitive interface for users to interact with the system. It includes features like a dashboard for quick access to assets, interactive search, and dynamic layouts that adapt to different devices for a consistent user experience.

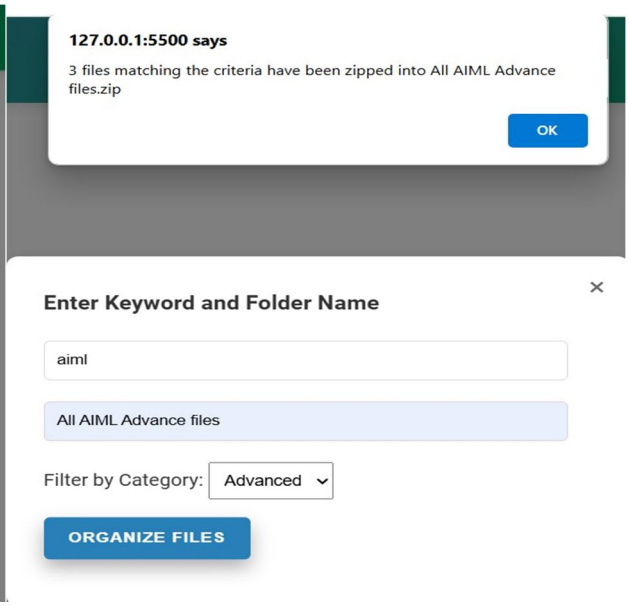
IV. RESULTS AND EVALUATION

Figure shows some of the snapshots of the application. Initially, the application gets loaded and the user can explore the features of application or he/she can proceed with the application. The application prompts the user for uploading folder or file wherein the user can provide keyword/metadata and new filename where the selected files will be compressed into a zip folder. Also, the user can filter the categorization of files as basic or advanced depending upon the file type, keywords and file size.









V. CONCLUSION

The Digital Asset Organizer (DAO) project addresses the critical challenges of managing and organizing digital assets in an era of exponential data growth. By leveraging modular architecture, the system provides an efficient, user-friendly, and scalable solution for asset organization, search, and retrieval.

The integration of advanced features such as AI-powered search, metadata management, and robust security ensures seamless and secure management of digital assets for individuals and teams alike. The system's collaborative features and intuitive interface foster productivity while maintaining asset integrity and accessibility. Additionally, its analytics and reporting capabilities provide actionable insights, empowering users to make data-driven decisions about asset management. Overall, the DAO system stands as a comprehensive tool that streamlines workflows, enhances user experience, and adapts to the growing demands of digital asset management in diverse environments. Future enhancements could include deeper AI integration, multi-language support, and expanded compatibility with external platforms to further enrich its functionality and applicability.

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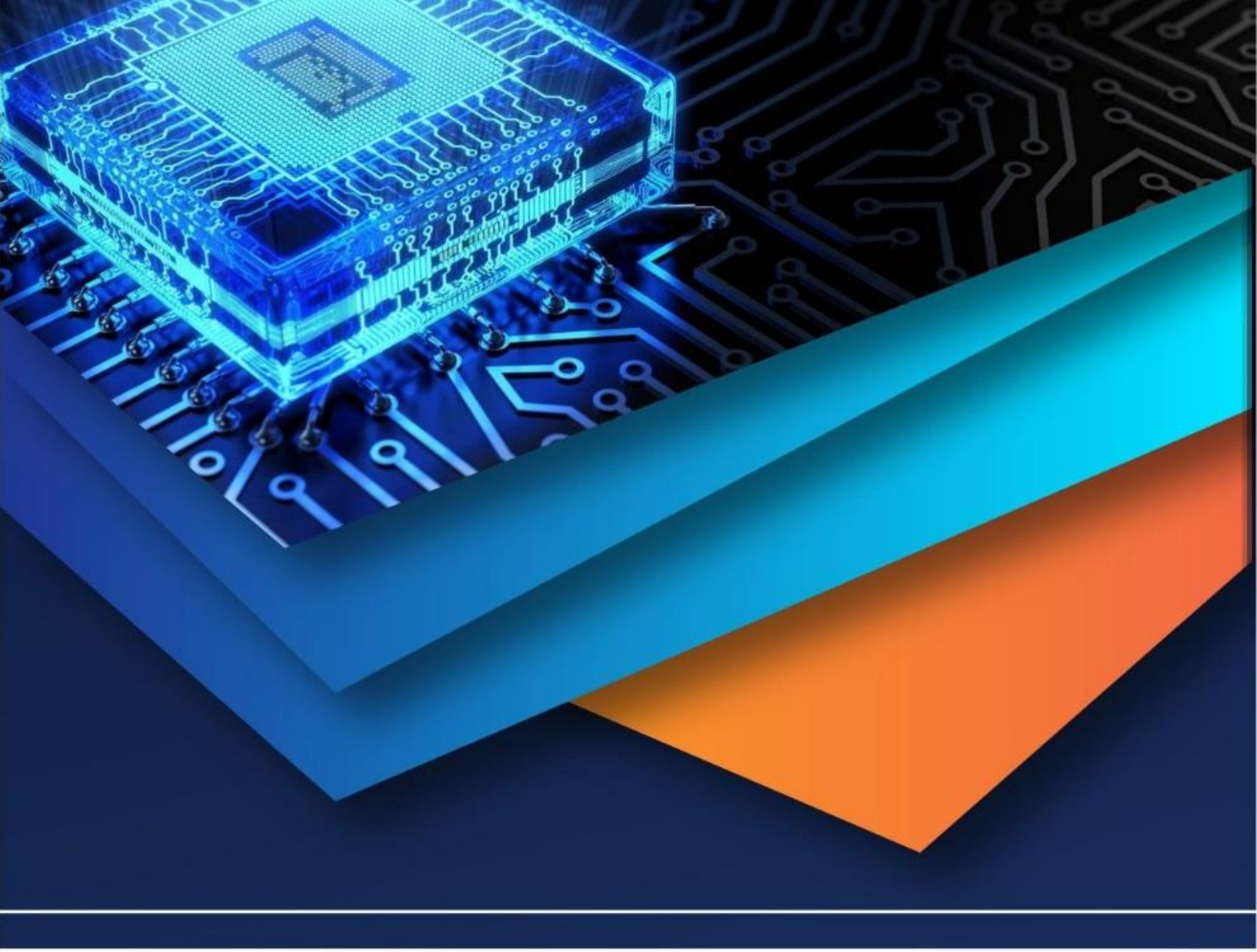

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