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Virtual Scrapart

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***Abstract:** In today's world, many art forms are in dying phase, due to lack of interest, recognition of supreme artist and lack of proper organized platform. Moreover, there are many aspiring artists who think there is a lack of marketplace for selling their products. Apart from this, there is a sharp increase in scrap generated from households and industries. According to International Trade Administration in 2020, 32 million tons of ferrous (Iron) scrap was produced as waste. Most of this waste can be reused if refurbished properly. There are many artists and craftsmen who are willing to work on such used products to create useful and reusable products. There are around 10,054 artists around the world who think there should be a proper platform where buying, selling and refurbishing of a product could be performed. With the use of modern technology such a platform can be developed by establishing a Server and developing a Mobile/Web – Application to interact with buyers, sellers and artists to convert waste into prime products.*

I. INTRODUCTION

An enormous amount of scrap is produced on daily basis in our households and Industries. This amount is ever increasing and if not put to good use, it will only contribute to pollution. The scrap metal produced in industries can be recycled instead of procuring raw iron again. This recycling proved to be beneficial financially and environmentally friendly and due to this, a wide range of industries and individuals started metal recycling. Many people earn through scrap business these days and it also helps in boosting the economy and creating employment opportunities. This recycling is not limited to metal, normal household scrap can also be turned into something useful if recycled properly. This is the main purpose of our system, which promotes recycling and reduces pollution and lessens our carbon footprint. It gives a platform for those who can turn the broken, used, no longer needed articles of household or industrial scrap into something that can be used or bought by normal customers. It encourages local artists to sell their items and buy the broken, useless scrap materials for cheap rates on the same platform. Our platform also helps in supporting the campaign of #VocalForLocal. In the long run, this project will help us in creating awareness about not only the local artists, but also about the pollution we cause by not recycling our scrap. Which in turn, will help in contributing to reduction of pollution and carbon footprint. Artists can use this platform to buy old, used products and sell their own artistic work. Moreover, they can buy artistic stuff from other artists. This will help in creating an artists' community. They can learn from each other and improve their work and this platform will bring a chance for them to collaborate and work. Meanwhile, the normal customers who are not much aware about art and artists can browse the Art section of the app to check out the products listed there. This application is based on React Native which makes it possible to use it on Android and iOS operating systems together. With an easy-to-use interface, it has simple functionality where a user can upload the picture of their used/broken product/scrap. Interested artists can buy the article from the platform. Later the artist can repair, refurbish and artistic touches to the existing product and make it usable or something worth buying. This product can now be uploaded into the Art Section where normal consumers can buy the products they are interested in at cheap prices. This platform solves many problems all at one place, which is the strength of this project. Selling, buying, refurbishing, and buying again, occur in same place.

II. MOTIVATION

In this virtual era, where almost everything can be done online, there is a need for a platform where people can sell off their scrap virtually. Normally, we sell our used products or things which are not useful to us anymore and sometimes we need to buy pre-owned products for various reasons. This platform can be used to do both at one place. Budding artists who have limited budget, need raw materials for working on, at cheap rates. These artists can turn the broken materials into something artistic and useful by using their talent and later sell it to earn profit on the same platform. This will also provide them with employment opportunities. Considering the lack of awareness and attention for art in our country, this platform can prove beneficial for the artists and well as people who want to buy refurbished artistic products at an affordable rate as both the selling of old, used, broken materials and buying of refurbished, artistic products are occurring at the same place.

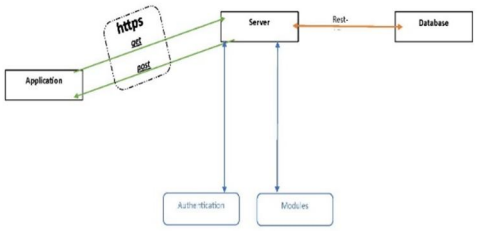

Fig .1 Request and Response flow chart

III. METHODOLOGY

1) *Application-Server – Server:* Hypertext transfer protocol secure (HTTPS) is the secure version of HTTP, which is the primary protocol used to send data between application and server. HTTPS is encrypted to increase security of data transfer. This is particularly important when users transmit sensitive data, such as by logging into a bank account, email service, or health insurance provider.
2) *Server - Database:* REST-API (Representational State Transfer Application Programming Interface) is a standard protocol that allows communication between different systems on the web. It provides a simple and flexible way for different applications to interact with each other using HTTP (Hypertext Transfer Protocol) methods, such as GET, POST, PUT, and DELETE. A RESTful API uses HTTP methods to perform operations on resources identified by URLs. Each resource is represented in a specific format, such as JSON or XML.
3) *Authentication:* SHA-256 (Secure Hash Algorithm 256-bit) is a cryptographic hash function that is widely used in various security applications to generate a unique digital fingerprint of data. It is a one-way function, which means that it takes input data of any size and produces a fixed-size output of 256 bits. SHA-256 is considered a highly secure hash function because it is resistant to many types of attacks, including collision attacks.
4) *Navigation:* React Navigation is a popular library for routing and navigation in React Native applications. It provides an easy-to-use and flexible API that allows developers to define the navigation structure of their application and handle transitions between screens. It supports various navigation patterns, including stack, tab, drawer, and modal navigation. It is built on top of the React navigation API, which provides a way to interact with the native navigation controllers on each platform.
5) *MVC Architecture:* React (react-native), by itself is referred to as the V in MVC, which stands for View. It helps you build the visible component of your application. If you have more than one screen, you might need to keep track of global data, which can be done with something like Redux. That will be the M, which stands for the model. And finally, you have the C, which stands for the controller. These are the interfaces you expose to your users to alter your state.

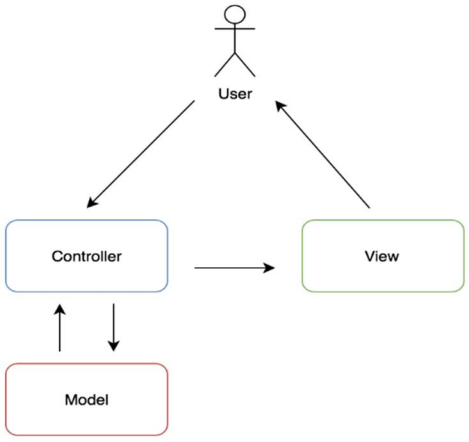

Fig 2. Model View Controller (MVC) Architecture

IV. FUNCTIONAL REQUIREMENTS

In software engineering and systems engineering, a functional requirement defines a function of a system or its component, where a function is described as a specification of behavior between inputs and outputs. They are product features or functions that developers must implement to enable users to accomplish their tasks. So, it's important to make them clear both for the development team and the stakeholders. Generally, functional requirements describe system behavior under specific conditions.

A. *The Functional Requirements Of The Project Are Listed Below*

1) *Login With Different Privileges:* Users registered with different type of account will be able to login with different level of privilege.
2) *Search Functionality:* Searching of different articles through search box and finding relevant results through search box.
3) *Completing Purchase:* Payment through APIs and storing details of transaction and purchase in database.

B. *Functionalities Of The System Can Be Divided Into 4 Major Parts*

1) *Buying Window*

a) The user is verified by the system login and comparing credentials from the database.
b) After that the system makes a http request to customer and takes details regarding the item to sell.
c) Server sends the data to the database and commits the database as a save point.

2) *Selling Window*

a) Server fetches the data of item and puts them for sale in the purchase section.
b) Users form the account with artist/ buyer account can view these products.
c) Visualization and viewing of refurbished products would be possible from this window.
d) 3D model of finished product would be presented by making use of third-party APIs thus enabling user to get idea about the product.
e) Thus, in conclusion and after finalization payment for the purchase could be made.

3) *Payment Window*

At the time of buyer buying any refurbished product or artist buying a scrap product the final step will be the payment window.
a) Payment will be completed with razor API.
b) Time limit will be set for each payment by API itself and inbuilt function of API will be used for payment function.
This API provides different payment options such as card payment, net banking, and payment on delivery.

V. EXPERIMENTAL STUDY

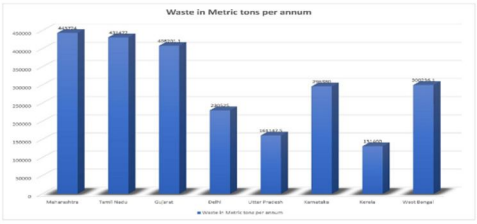

Fig 3. State-wise Waste generated

According to the ministry of environment, forest, and climate change, under the government of India, India is the fifth-largest economy in the world. The nation generates approximately 62 million tons of waste with an average annual growth rate of 4%. It is also found that currently, India generates 70 million metrics of municipal solid wastes. Out of it, only 20% is recycled and the rest ends up in landfills and oceans affecting humans, and marine life, along with destroying the environment. This necessitates a solid waste management system in place. It is estimated that waste management in India is potentially a $15 billion industry.

Out of the entire waste produced in India, 25% are dry waste components that can be recycled. This recyclable waste, dumped into landfills due to a lack of proper collection and infrastructure, can be reused as raw material. If it is properly segregated and processed further, it can be a highly lucrative source of revenue generating.

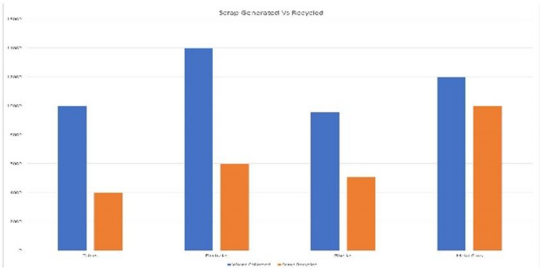

Fig 4. Waste Generated vs Waste Recycled

According to the Un-Plastic Collective (UPC) study, India produces 9.46 million tons of plastic waste per year, with 40% of its remaining uncollected. India also generates about two million ton's (MT) of e-waste annually, which makes plastics and electronics two key components of waste generation. However, these waste generation components, alongside solid waste, have a huge potential to be capitalized into channels of high revenue generation. Similarly, in 2020, 81 billion worth of paper waste and paper pulp was imported to India. On the other hand, only 20% of paper waste is being collected, segregated, and recycled rest goes to landfills. The same applies to glass and metal waste.

It is high time we shift our focus towards gaining increasing utility from waste generation. Every industry is aiming to enhance its profit margins. This can be accomplished in one of two ways: either by raising the selling price or lowering the cost of manufacturing.

C. The Functionality behind Creative Scrap arts are:

1) Admin – Login has the following access:

* Admin can login using credentials
* Admin can manage user accounts
* Admin can manage the creative and scrap item categories
* Admin can View/manage order details
* Admin can view payment details
* Admin can also view review and rating-

2) Artist – Login has the following access:

* Artist can login using credentials
* Artist can manage user accounts
* Artist can manage the creative and scrap item categories
* Artist can View/manage order details
* Artist can view payment details
* Artist can also view review and rating

3) User - Login has the following access:

* User can log in on the website
* User can manage his/her account.
* User can view/search/filter creative & scrap items
* User can view the category of the creative or scrap items
* User can buy & sell creative or scrap items
* User can manage the items details
* User can manage the items in the shopping cart
* User can view details related to orders
* User can give rating and review.

VI. SYSTEM ARCHITECTURE

A. *Existing System Architecture*

There is a current existing platform which deals with buying and selling preowned products. The existing system follows simple flow and requirements for this system are basic. It uses a Web Application platform where user browse through different articles, when the customer feels like purchasing any article, then the customer is directed to a checkout page where a payment API acts as an intermediate between the buyer and seller. The detail of the transaction is stored in database, generally SQL database is used for this purpose.

The existing system fulfills the purpose of acting as an intermediate between buyer and seller but need to add new functionality where visualization can be adapted using 3D-modelling where customer could get an idea about how any refurbished product would appear.

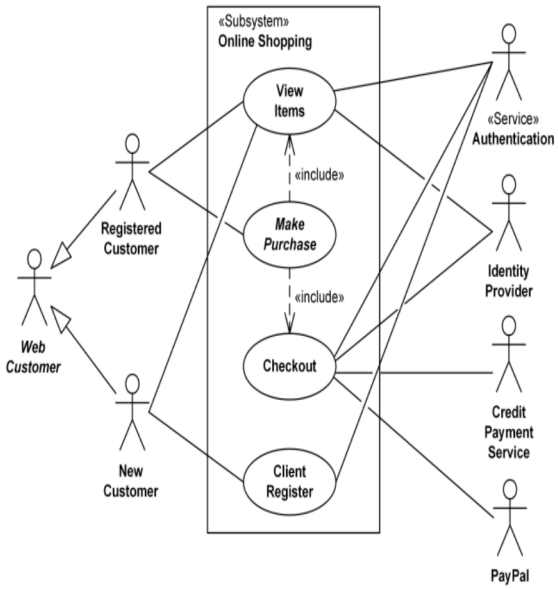

Fig 5. Existing System's UML-Diagram

B. *Proposed System Architecture*

The proposed architecture not only consists of providing a platform for buying and selling articles but also enabling customers to visualize 3D models of the article up for sale.

Every user will have a different privilege of accessing accounts and performing different functionality. Normal sellers would be able to sell used articles, buyers can buy products directly from the seller or via auctioning from the user. Cloud based server is used for processing different requests and a NoSQL database is used to store data of users, information about articles and transaction details of purchases on the platform.

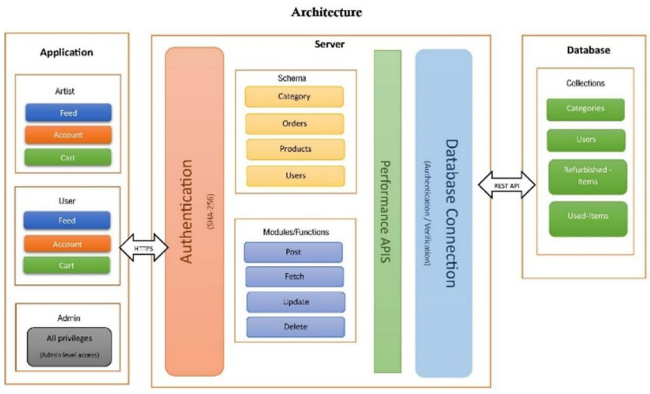

Fig 6. Proposed Architecture

VII. RESULTS AND DISCUSSIONS

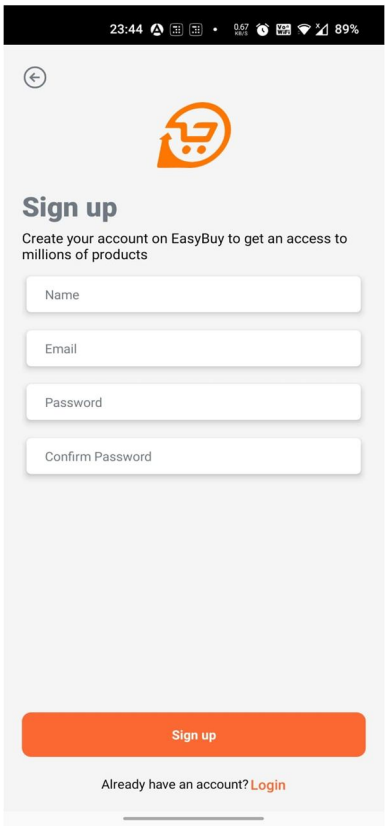

Fig 7

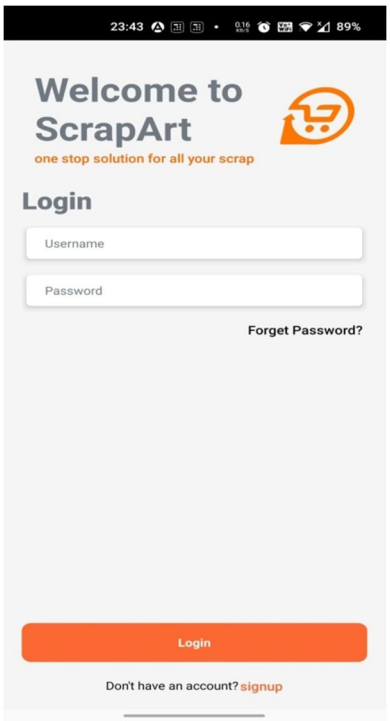

Fig 8

Fig 7 and Fig 8. shows Login Page for the user, artist and admin

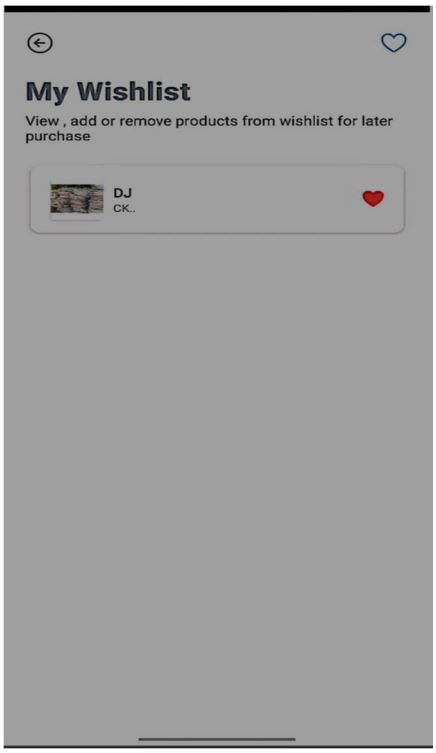

Fig 9

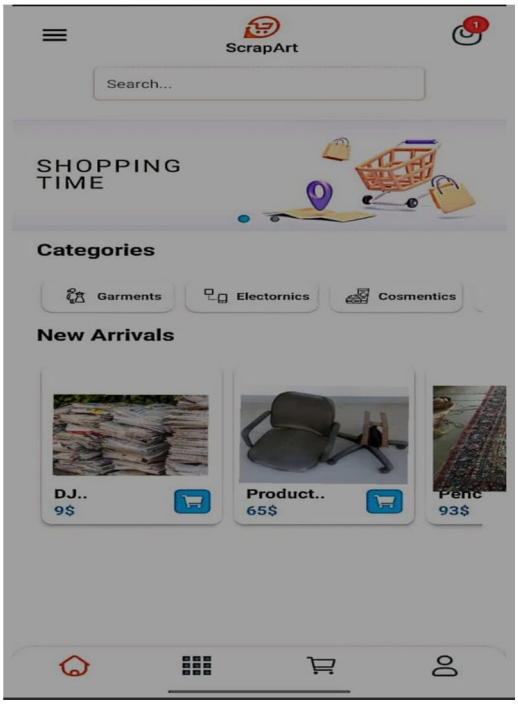

Fig 10

Fig 9 and Fig 10 shows the categories and the Wishlist for the user.

VIII. CONCLUSION

Virtual Scrapyard is a platform which will help artists and individuals to buy and sell off items at cheaper rates without hassle. It can also be used on an industrial scale to buy or sell scrap online. It is also targeting the customers who are aesthete and appreciate works of art. It also provides visualization to improve communication with the clients.

IX. ACKNOWLEDGEMENTS

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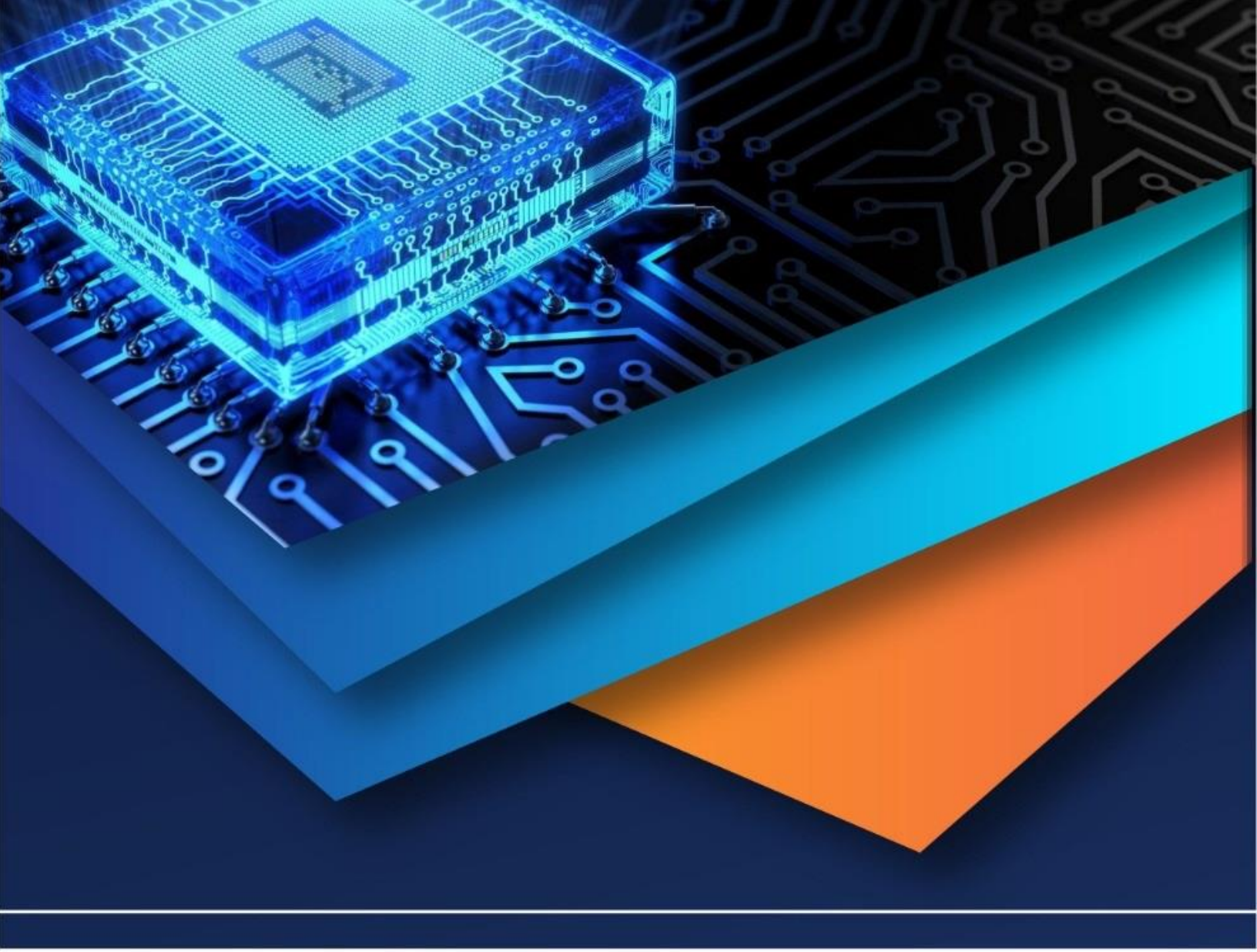

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