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Online Heavy Equipment Booking

Prof. Urjashree Patil[1], Srushti Gawai[2], Bhakti Shikhare[3], Yashali Bhandarkar[4]
SSJCOE Dombivli (E)

Abstract: ***Heavy Equipment is an essential infrastructure industries. Traditional Equipment booking system such as phone, email and calls are time consuming, often leading to missed opportunities for both the customer and equipment rental companies. Online heavy equipment booking platforms have emerged as an alternative method that provides quick and easy access to rental equipment for construction and infrastructure projects. In a selected residential building construction project, Monte Equip mental simulation was applied for estimating the productivity on a construction site with selected parameters. The results reveal that scheduling heavy equipment and productivity are not given much consideration by Turkish construction enterprises, and their data on productivity only makes use of straightforward extrapolation for planned construction activities and daily papers from a machinery department. This paper briefly describes the features of the Turkish construction industry with reference to equipment scheduling and productivity evaluations in order to achieve significant cost reductions during construction projects. It also recommends simulation methods like Monte Equipment for estimating costs and productivity.***
Keywords: Equipment booking, Online booking system, AWS, Android, React native

I. INTRODUCTION

The development of diverse applications for a commercial enterprise's needs depends heavily on the software requirements that support business activities. For the management of software applications and businesses, enterprise has become a well-established profession. A discipline known as enterprise makes an effort to combine, control, and analyse enterprise parts. Synergy is produced when elements are aligned to achieve organisational goals. Create a software system that includes the following stages: analysis, planning, design, implementation, testing, and management.[1]

The effective use of labour, materials, and equipment must be vigorously pursued in good project management in the construction industry. The improvement of labour productivity ought to be a top priority for anyone in charge of keeping construction facility costs under control. To cut costs, material handling—which includes purchasing, inventory management, shop fabrication, and field maintenance—needs special consideration. Construction technology has undergone radical development in recent decades because to the employment of new tools and creative techniques. Construction-related organisations that fail to recognise the effects of various developments and fail to adapt to changing surroundings have legitimately been pushed out of the industry. The fundamental tasks in building any project are excavation, transporting little or huge amounts of earth, and digging. [2]

Construction companies frequently deal with issues connected to a high rate of equipment breakdown or failure, as well as accidents brought on by misuse by inexperienced personnel. Equipment-related mishaps are frequently attributed in large part to inadequate training of equipment operators (John and Herman, 2009; Schenayder et al., 2002). The cost of equipment repair, wasted fixed and variable operating expenses due to equipment downtime, and a plethora of consequential costs that reverberate and spike throughout the construction industry, according to Agbo in 1983, are huge. The only way to prevent this enormous amount of loss that frequently results from equipment failure or breakdown is to implement an effective equipment maintenance management strategy. By doing this, the project may be finished quickly and construction equipment is always in good shape. This will ensure that construction equipment is always in good condition, enable timely project completion, and increase construction project profitability. Hence, in order to grasp efficient management of construction equipment, one must also comprehend efficient equipment maintenance. Construction managers must be made aware that, if done correctly, maintaining construction equipment can actually be profitable rather than being a necessary evil as previously believed. [3]

A. Purpose, Scope, Applicability

1) Purpose

The main purpose to start this project was that anyone can book heavy equipment from where ever and when the need. Customers who want to book a heavy equipment don’t want to wait until you are in the office — they want to lock in the activity on their own schedule When you use an online booking system, your business is open 24 hours a day, seven days a week. Customers can be

required to prepay for rentals using an online booking system. This gets money into your pocket faster and ensures that you don't have to worry about payment on the day of the event.

2) Scope

The goal of the project is to provide a platform that allows heavy equipment rental businesses to give their clients a simple, effective, and convenient way to book equipment online. The portal will provide a catalogue of available equipment with thorough descriptions and costs, a calendar of equipment availability, and a booking form where users can enter their contact information and rental details. The objective is to improve the user experience for clients while streamlining the rental process, minimising the need for manual intervention, and giving heavy equipment rental companies a powerful platform to manage their bookings.

3) Applicability

a) This software can in used in wide domain from airport security to ATM office security.
b) This majorly helps us in Access Control. Airport Security can also be improved in huge margin with this system.
c) It can also be help full in the banks and offices where confidentiality of information is very important.
d) Moreover, Financial Services sectors, Law Enforcement and Driver's Licenses & Passport authentication offices can use this application for boosting the security.

II. LITERATURE SURVEY

The concept of online heavy equipment booking has gained atttraction in recent years, as businesses seek more convenient and cost-effective ways to rent or purchase heavy equipment. In this literature survey, we will explore some of the key studies and articles that have examined this trend and its impact on the industry.Researchers looked at the factors influencing the adoption of online rental platforms for construction equipment in a study that was published in the Journal of Construction Engineering and Management. The study discovered that deciding to utilise online rental platforms is significantly influenced by criteria including trust, perceived utility, and perceived simplicity of use. The study also emphasised the significance of user comments and customer support in fostering user trust.[2]

Another study examined the possibilities for using blockchain technology in online reservations for heavy equipment, and it was published in the Journal of Engineering, Design, and Technology. A blockchain-based solution was suggested in the study to enable safe transactions between booking platforms, dealers, and enterprises. The technology would also give dealers a way to confirm the ownership and state of the equipment, lowering the possibility of disagreements between parties.[3]

In an article that published in Construction Executive, the writers talked about the advantages of ordering heavy equipment online, including the chance to compare dealer costs and product details. Additionally, the article emphasised the usefulness of customer feedback and ratings in fostering user trust as well as the opportunity for booking platforms to offer value-added services like maintenance and repair.[1]

Study examined at the development of an online platform for renting construction equipment in China in a case study that was published in the International Journal of Information Management. The platform was shown to be effective in lowering transaction costs and enhancing the effectiveness of the leasing process. In order to ensure that the platform is used successfully, the study also emphasised the significance of user education and training.[5]

The author of a Construction Company Owner article talked about how renting heavy equipment online might change the rental market. The paper emphasised the potential for expanded booking platform competition to drive down costs and improve services for businesses. In order to ensure a smooth rental procedure, the piece also underlined the value of developing close ties with dealers and logistical service providers.[7]

A. Outcome of Literature Survey

There are some pros and cons of every system. Here are some of them.

1) Pros

a) Single Platform Multiple Booking Types We can sell or book multiple equipment at a time from the system hence user don't need to search for multiple vendors and vendors does not require to keep track of multiple users.
b) Slot Management: Close Bookings If any equipment is booked, then no one can access the equipment unless it is vacant for another booking, and user can access same equipment from another vendor.
c) Booking Cancellation Option for Customers If user don't want to hire the equipment, then he or she can cancel it before it will reach the destination.

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d) Price Per Booking: Time Slot Management Once the equipment gets hired for the slot and reached the destination the user and vendor will get the alert and the system will calculate the time used by the user and the price for the booking. And hence the vendor will get payment quicker. The price will vary as per equipment.
e) Handle Customer Complaints We can take feedback from the customer as per their experience with service of system as well as the equipment. And can update the policies of system.

2) Cons
a) You need Internet access User and vendor both need internet connections as well as working GPS connections.
b) On time cancellation 14 14 If user cancels the booking in mid-way vendor must have to the travel expenses.

III. PROBLEM DEFINITION

More and more companies are seeing the benefits of renting the equipment they need rather than buying it. Obviously, this is great news for the industry, but the rise in popularity also means rental companies are faced with more challenges. In this blog, we discuss some of the common challenges faced by rental companies, like yours, and how you can overcome them.

1) Managing complex reservations and pricing models
2) Monitoring equipment availability
3) Processing equipment returns
4) Keeping up with equipment maintenance history
5) Tracking equipment utilisation
6) Delivering excellent customer service consistently

Consider using an automated online system that:

a) Consolidates information into one easy-to-access dashboard so it's easier to manage bookings, find pricing information (bespoke or otherwise) and inventory in one place.
b) Allows cross-team collaboration - e.g., employees from different departments sharing task schedules, notes and updates, which boosts productivity.
c) Allows you to gain an overview of all your equipment, such as when rental periods start, finish and when maintenance is required, so project planning is easier.
d) Makes it easy to customise bookings e.g., offering add-ons for customers to build their ideal package 17 17 Technology is the key to overcoming most of these challenges. But it's not any old piece of tech. You need to choose the right rental solution to transform your business operations.

IV. FUNCTIONAL SPECIFICATION

A. User Specification
1) Admin: Admin can add an Equipment, manage booking Equipment and rent, view inquiries, and feedback.
2) User: Users may quickly hire out equipment, examine information about what is available, and make feedback and enquiries in addition to booking equipment.

B. Module Specification
1) View available Equipment's: The system was created specifically for large, high-end, and small equipment rental businesses. The user can browse the available equipment and make a reservation for it.
2) Booking Equipment: The user can browse the equipment that is available and make a reservation for it.
3) Easily Get the Equipment on Rent: The Customer can easily get the Equipment whenever they need to on the rent with use of this system.
4) Give Feedback: The customer will provide feedback to the administrator.
5) Enquiry: The inquiry can easily done by user.
6) Add Equipment: The Admin can add Equipment so that users can see the available Equipment and book it.

7) *Manage Rent:* The administrator can manage the rent so that the user can see it and book the equipment.
8) *View Feedback:* The admin easily view the feedbacks and solve the query.

V. EXISTING SYSTEM

An existing system can provide paper work manually.

1) The user must go to the office where they can rent equipment and book their equipment.
2) You cannot provide user feedback to the admin online in the current system.
3) You cannot easily book your heavy equipment in the current system.
4) It will take some time for you to go to the office and reserve the equipment.

VI. NEED OF NEW SYSTEM

The new system is a totally computerized system.

1) A new system provides features like time efficiency to show Equipment details, user profiles
2) and whatever the customer will give the feedback to the admin.
3) An inquiry is easily done by user in the system.
4) It is the most software application for managing online Equipment rental business.

VII. SYSTEM ARCHITECTURE

The system architecture for an online heavy equipment booking platform involves several key components that work together to provide a seamless and efficient user experience.

These components include:

1) *User Interface:* The user interface serves as the main interface via which the user and the platform communicate. Users should be able to quickly browse the equipment that is offered, evaluate costs and features, and make reservations or purchases thanks to its intuitiveness, user-friendliness, and responsiveness.
2) *Database:* The database is the backbone of the platform, storing information about available equipment, pricing, user profiles, and transaction history. It should be scalable, secure, and easily accessible to authorized users.
3) *Payment Gateway:* Secure interactions between the platform and users are handled by the payment gateway. To enable precise invoicing and payment monitoring, it should link with the platform's database and offer a range of payment options, such as credit cards, e-wallets, and bank transfers.
4) *Logistics Management:* Between dealers and users, the logistics management component is in charge of organising equipment delivery and pickup. Several delivery locations should be supported, and it should be able to track deliveries in real time and offer updates on their progress.
5) *Equipment Inspection:* Making sure the equipment is in good shape both before and after a rental is the responsibility of the equipment inspection component. To gather information on the functionality and state of the equipment, this may entail the use of sensors, cameras, or other tools.
6) *Analytics and Reporting:* Insights into user behaviour, equipment usage, and platform performance are provided by the analytics and reporting component. This data may be utilised to enhance platform functionality, manage pricing and inventory more effectively, and give dealers and other stakeholders data-driven insights.
7) *Customer Support:* Throughout the rental or purchase process, users can get help and support via the customer service component. This can contain a knowledge base or FAQ part to answer frequent problems and queries, live chat, phone assistance, or email support.
8) *Integration with Dealer Systems:* To provide correct inventory management, pricing, and billing, the platform should be integrated with dealer systems. To link the platform to the dealer's current systems, this may entail the use of APIs or other data exchange methods.

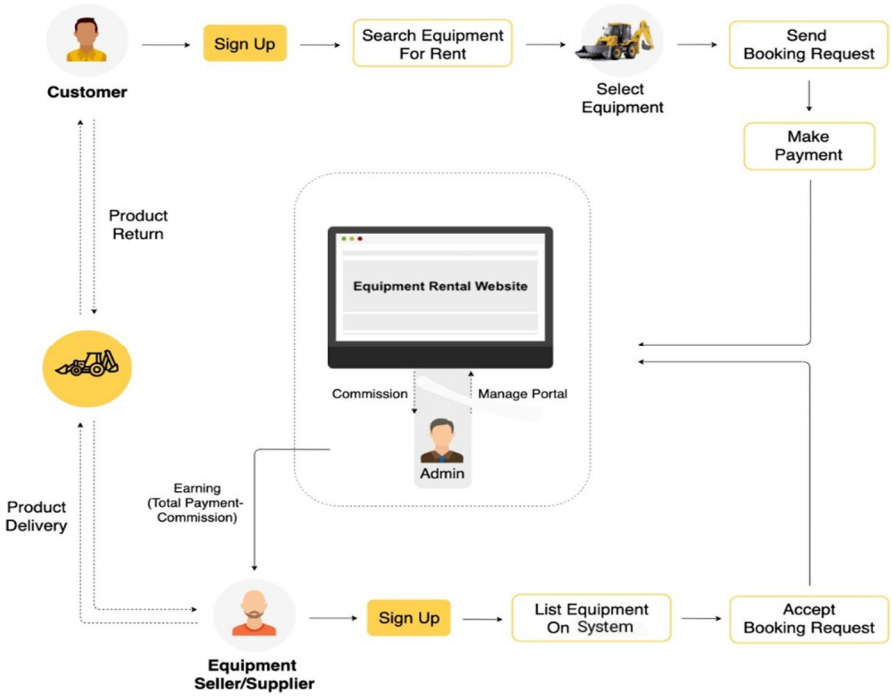

Fig. 1 System Architecture

VIII. FLOW DIAGRAM

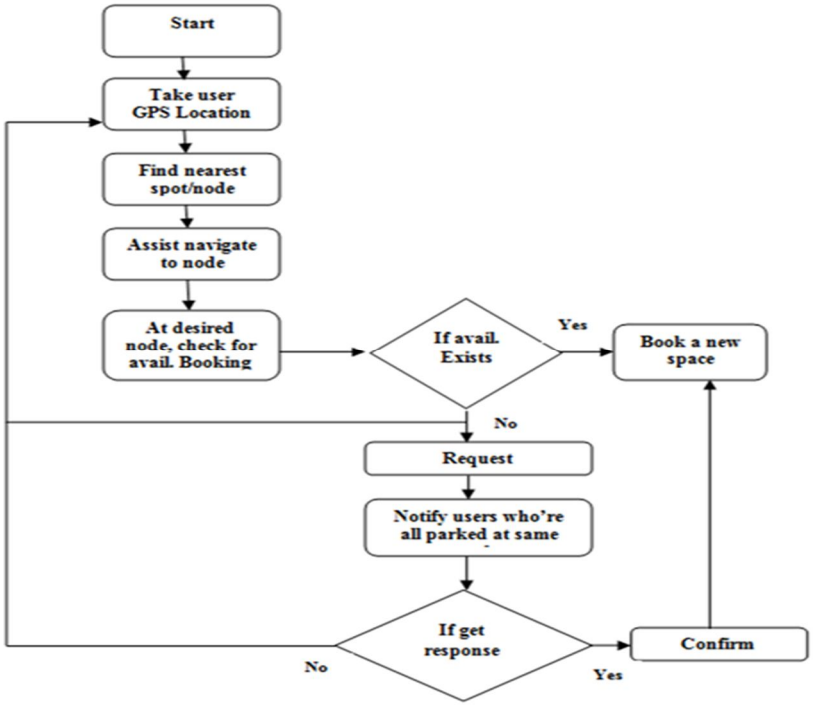

Fig. 2 Flow Diagram

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IX. REQUIREMENT ANALYSIS

Objective - It is a system design specially for large, premium and small Equipment rental
Business- The Equipment rental system provides complete functionality of listing and booking Equipment. In this system, Tourism and Travelling facilities also provide.
Platform – website

A. Front End

Front End - Asp. NET 4.0 with c#

B. Back End

Back End - Microsoft SQL Server 200

X. FUTURE SCOPE

Booking heavy equipment online has a promising future. The need for heavy equipment rentals will rise as the infrastructure and construction sectors continue to expand. Platforms for booking heavy equipment online will advance, providing clients with real-time delivery tracking and equipment availability. Also, in order to give consumers a more customised rental experience, equipment rental companies will implement emerging technologies like IoT and AI.
Some potential future development in the industry includes:

1) Real time equipment availability and delivery tracking.
2) Virtual equipment booking
3) Artificial intelligence and predictive maintenance
4) More personalized rental experiences

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Some potential future development in the industry includes: Real time equipment availability and delivery tracking, Virtual equipment booking, Artificial intelligence and predictive maintenance, More personalized rental experiences.

XII. RESULT

1) First page of Online Heavy Equipment Booking

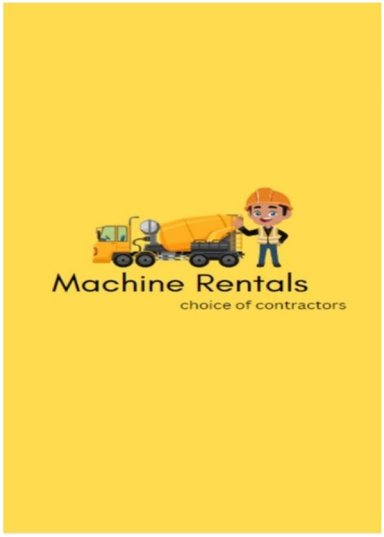

Fig. 3 First Page

2) Sign In page where the user can log in

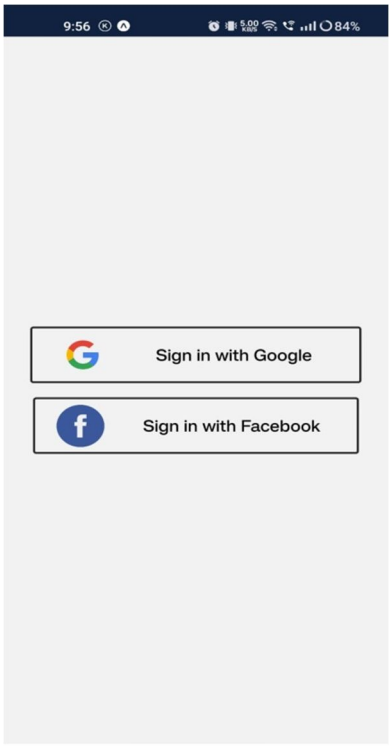

Fig. 4 Sign In Page

3) Home Page where the user can see the home screen

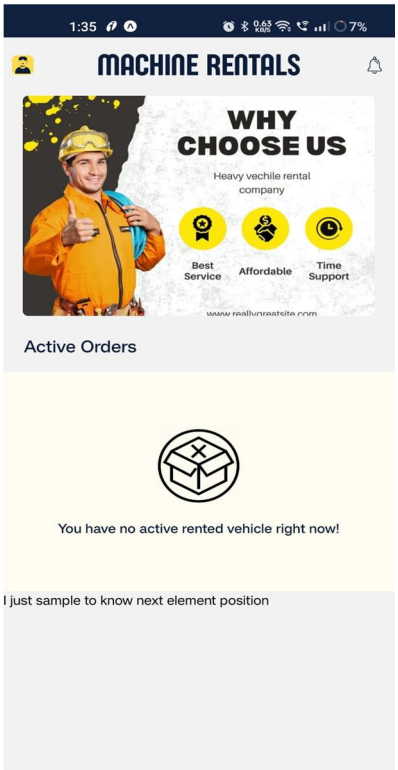

Fig. 5 Home Page

4) Order History Page where the user can order equipment.

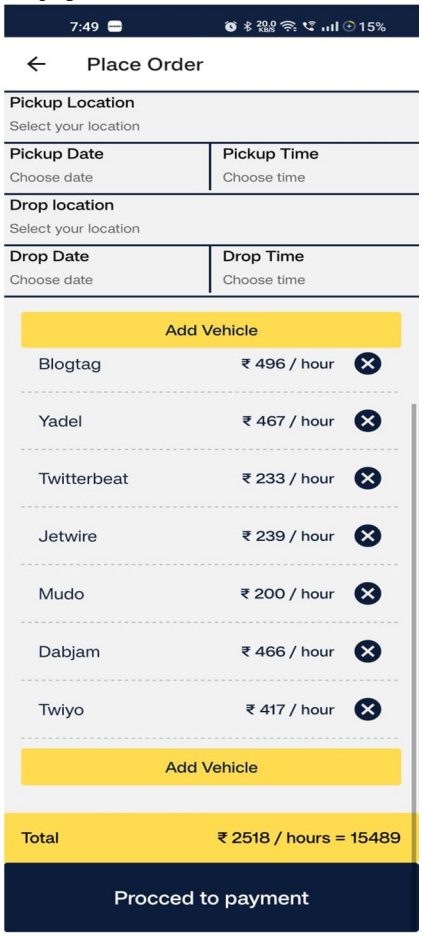

Fig. 6 Order Page

XIII. CONCLUSION

In a construction environment where usually past data based on the experience is used, estimation and simulation techniques become important for future projects' productivity analyses. Additionally, this fact directs project planners to make decision based on limited information that eventually results in significant error in estimations. However, by using modern simulation techniques wide range of probabilities can be calculated and error margins can be decreased. The advantage of the XP framework in system is the involvement of team is small, but has a very high productivity in system development. The application made in this research is a heavy equipment rental application using the XP framework that tested with unit testing in each module. In the XP framework the important thing is user's involvement in system development, mastery of CRC mapping and OOP, because the XP framework is very suitable in accordance with the concept of object-oriented programming.

XIV. ACKNOWLEDGEMENT

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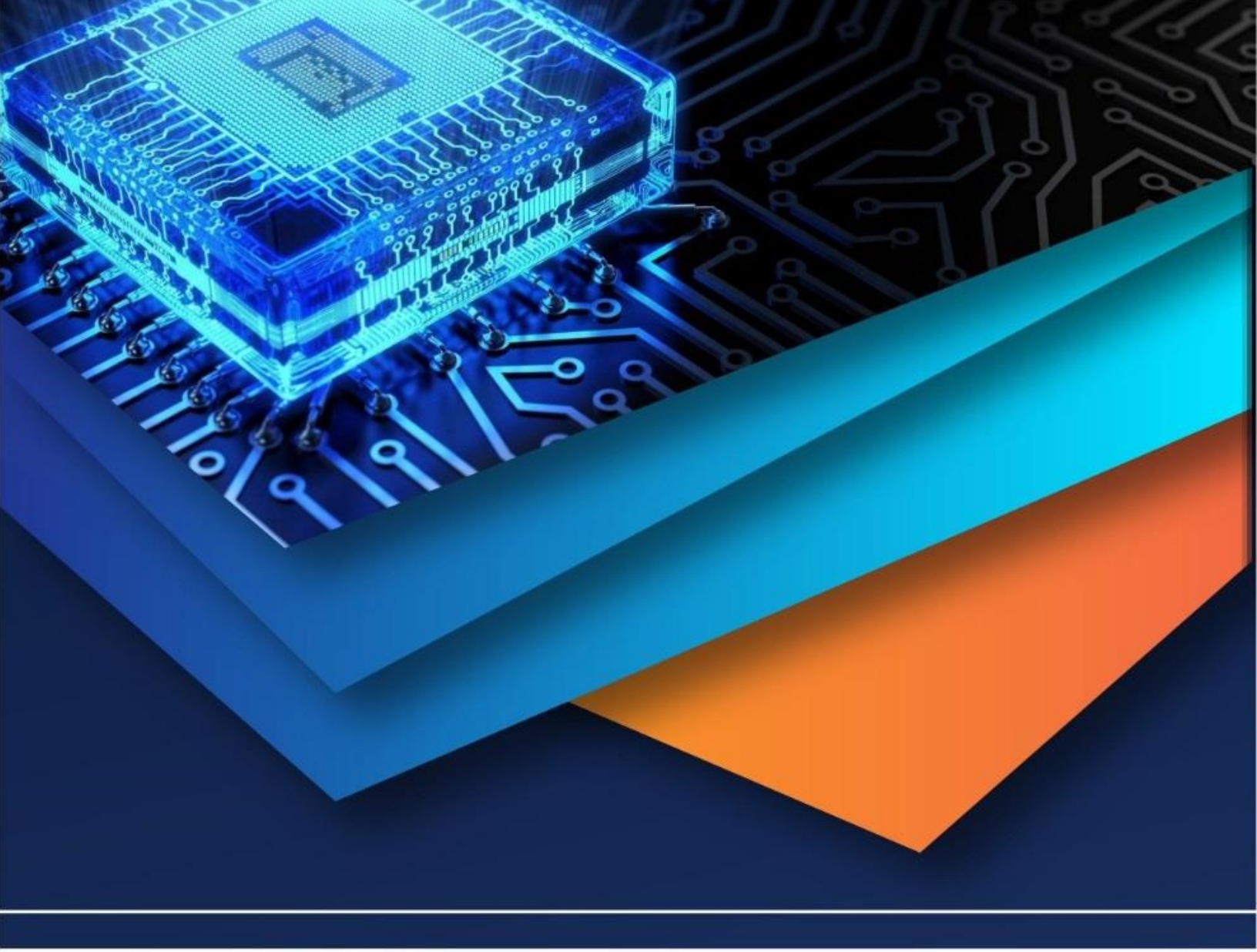

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