iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VIII **Month of publication:** August 2022

DOI: https://doi.org/10.22214/ijraset.2022.44625

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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 10 Issue VIII August 2022- Available at www.ijraset.com

Coin Based Mobile Charger

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Abstract: ***When a coin is entered into the coin-based mobile charging system, the phone is charged. This technology is used by store owners and rural residents, and it can be deployed in public places such as train stations and bus stops to allow mobile charging. As a result, the coin acceptor detects legitimate coins and alerts the Arduino to take action. If a genuine coin is found, the Arduino receives a signal and begins the mobile charging mechanism, which provides a 5v supply to the phone via a power supply section. To display the charging time for the cell phone, the Arduino launches a reverse countdown timer. The user then inputs another coin, which the Arduino adds to the time left and decrements the countdown once more. And also here we connect Arduino to the internet by adding ESP8622 WI-FI module. It is a wireless and everything will be done on offline. It enables IoT service. Which updates the number of entries of a coin to the system. It will available in server side. This method can be used to charge smart phones in public settings. This coin-based mobile charging device provides sufficient power to the phone and is available on demand in public settings.***

Keywords: Mobile phone, Coin Acceptor, Arduino UNO, Lcd Display, Relay, WI-FI module.

I. INTRODUCTION

The goal of this idea is to insert a coin utilizing a mobile phone charging in public places. This invention will be incredibly beneficial to those who use their phones in public locations without being able to charge them. In this initiative, everyone who uses a cellphone outside of the home is working in an office that is not equipped with a charger. The coin-based mobile phone charger comes in handy for those who prefer to charge their phones using coins. The IR receiver is utilized on the receiver side to receive the IR signal. To adjust the polarity of the pulse in SCU input, place a coin between the IR transmitter and receiver. The SCU converts low pulses to high pulses, which are then inverted in the inverter. The 555IC is used as a timer to generate a high pulse for a set amount of time. The SCU's gain is utilized to convert low pulses to high pulses, and the output is sent into the driver circuit's input. The driver circuit ensures that the relay's input voltage is sufficient. The relay will activate, allowing us to utilize the 230v charger to charge our phones. The ESP8622 WI-FI module was used to link Arduino to the internet. Because of its simple serial communication connectivity, the ESP8622 WI-FI module can be used as a server, WI-FI adapter, and wireless internet access interface for any microcontroller. Our ESP8266 will function as an Access Point (AP Mode), allowing other devices (stations) to connect to the Wi-Fi network over a wired network. The ESP8622 WI-main FI's purpose is to update the number of entries in the system's currency status to the cloud, which only requires one communication channel. The ESP8622 WI-FI module is used to establish a connection as well as to enable IoT services (cloud computation). The server will send the date and time. The coin acceptor determines if the coin is valid or not after it has been entered. The power is only available for a limited time for each unit of pricing. Based on the number of coins inserted, the Arduino can calculate the time. This approach is beneficial to persons who travel vast distances.

II. EXISTING SYSTEM

In previous models, the mobiles were charged using various types like solar panel, coin-based charging. This coin based mobile charger is used to charge the mobile phones in case of emergency provided that they don't have power bank. So this project model can be implemented in streets or they could be fixed to the post. The charging time for the phone is displayed on the LCD. In addition, a sun panel may be used to fee the device. Solar energy is used to charge cellphones in the majority of cases since it converts light energy into DC current. Insertion of a fixed coin size for charging is not developed during the existing system of the process.

III. PROPOSED SYSTEM

The existing system on the process would have been elaborated by the system where with the help of the IR sensor it checks the coin is valid or not. Here we are checking the real coins. If it is valid sends particular signal to the Arduino where it can be processed as a fact that it can be provided to the LCD display for the time duration for which it is done and for which it is provided as a display for the process.

And also it contains the WI-FI module which gives number of entries of a coin status to the system of cloud and it is based on the IOT service. Date time will be send on server side through mobile hotspot. It also have multiple pin to charge different mobiles.

IV. LITERATURE SURVEY

The main aim of the research is to provide charger based on the coin insertion. The System works according to the code that written in the microcontroller where we dumped the code in Arduino. When the coin is inserted, it checks valid coin or not. if it is valid send signal to the Arduino and then Arduino starts the mobile charging mechanism providing 5v power supply section to the mobile phone. [1] An infrared (IR) is used to send an IR signal from the transmitter side. The IR receiver is utilized on the receiver side to receive the IR signal. To adjust the polarity of the pulse in the input, place a coin between the IR transmitter and receiver The relay will activate, allowing us to use the 230v charger to charge our phone. When the coin is detected, the 555 timer receives a pulse, which triggers the relay (Electromechanical switch) and allows the cell phone to be charged. [2] This research will give a one-of-a-kind service to the general population.

V. SYSTEM ARCHITECTURE

Figure 5.1 depicts the architecture of the system. In this figure we are providing 12v power supply which is connected to Arduino UNO and also parallelly connected to coin Acceptor. Inside the Arduino we having two voltage regulator one is converting 12v to 5v for LCD and relay another is 3.3v which is connected to WI-FI module. And for charger 7805v regulator because Arduino UNO regulator can't provide enough current to WI-FI module

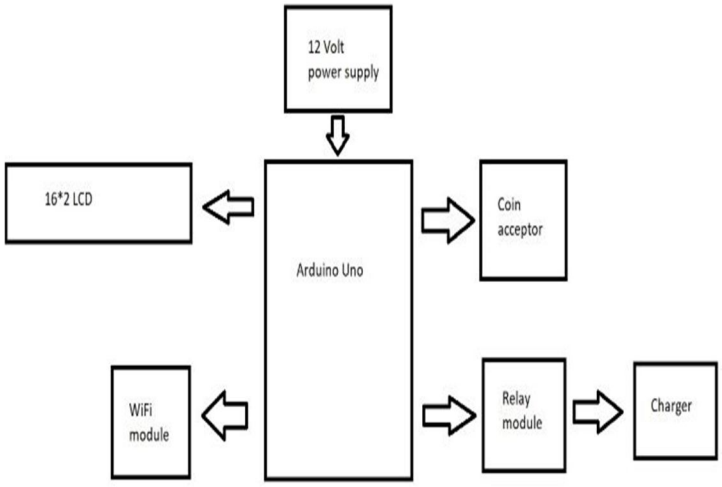

Figure 5.1: System Architecture

VI. REQUIREMENT SPECIFICATION

A. Hardware Components

1) Coin Acceptor: Through a coin insertion slot, the coin acceptor gadget accepts the coin. The CH-936 multi-coin sensor was utilised in this experiment. The coin acceptor's sensor will recognise and confirm the coin depending on its diameter. When the inserted coin is authenticated, it sends a signal to the Arduino, which turns on the power supply; otherwise, the coin is returned.

Figure 6.1: Coin Acceptor

2) *PCB:* PCB (printed circuit board) is a powerful application for designing circuit boards, whether single-sided or double-sided manufactured. It comes with all of the tools you'll need at each stage of PCB circuit design. We chose PCB over breadboard since it is more dependable.

Figure 6.2: PCB

3) *Resistor:* The amount of resistance to electrical current flow is measured by the resistor R. A two-terminal passive electrical component used in electrical circuits to control or regulate the flow of electric current. The more resistance there is, the less current can flow. The easier it is for current to flow, the lower the resistance is. Ohms are the units used to measure resistance.

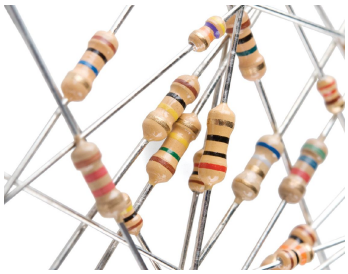

Figure 6.3: Resistor

4) *LCD:* Liquid Crystal Display is the abbreviation for liquid crystal display. 'Please insert a coin' will appear at first. When the coin is validated, the charging time is displayed; if the coin is not validated, it is rejected and dropped into the coin box, where it is asked to insert the coin again. The LCD is connected to the Arduino UNO and receives the system status to display on the screen.

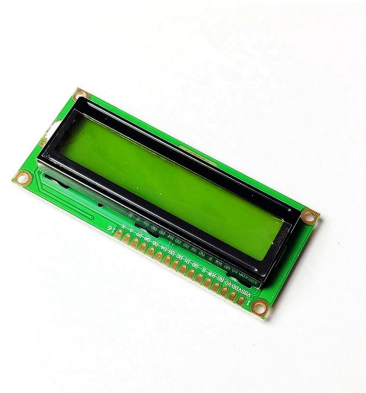

Figure 6.4: LCD

5) *Potentiometer: A* potentiometer is a form of electrical device that's also passive. The device's shaft provides changing resistance when twisted. To compute the amount of resistance, we'll use the analogue value provided by the potentiometer.

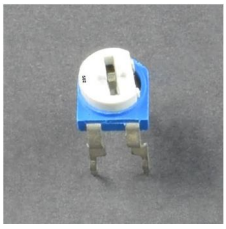

Figure 6.5: Potentiometer

6) *Connector:* You may use the USB port to charge and power your iPod or any other USB powered device. Charge your phone quickly and easily. You can charge all of your devices with a single connection, eliminating the need to carry multiple cables.

Figure 6.6: Connectors

7) *DC Adapter:* A DC connector, often known as a DC plug, is a type of electric connector used to supply direct current (DC) power. Each AC/DC power adapter is designed to take a given AC input (usually a household 120 V AC outlet) and convert it to a specific DC output. Similarly, each electrical gadget is tailored to work with a specific DC voltage.

Figure 6.7: Dc Adapter

8) *Relay:* A simple electromechanical switch is referred to as a relay. A relay is a switch that connects or disconnects two circuits, similar to how we use standard switches to close or open a circuit manually. A relay, on the other hand, uses an electrical signal to drive an electromagnet, which connects or disconnects another circuit, rather than requiring manual intervention.

Figure 6.8: Relay

9) *WI-FI Module:* WI-FI module, also called serial to WIFI module, is an IoT transmission layer component. ESP01 is the version of WI-FI module which is popular and inexpensive microcontroller board with built-in-WI-FI. The purpose of this module is to transform a serial port or TTL level into an embedded module. The ESP version of the WI-FI module is ESP 01 ESP8266 Serial WIFI Wireless Transceiver which is connected to the Arduino and it communicate with through radio signals. And it consumes low power the volage is 3.3V.

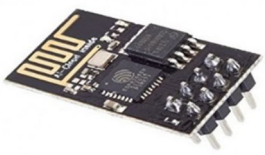

Figure 6.9: WI-FI Module

10) *Arduino UNO:* Arduino is a basic hardware and software open-source prototype platform. The ESP8266 ESP- 01 WIFI module connects microcontrollers to a wireless network. Because the ESP-01 is a minicomputer, it doesn't need a microcontroller to operate inputs and outputs like an Arduino. you can have up to 9 GPIOs (General Purpose Input Output).

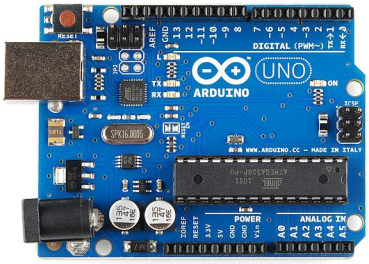

Figure 6.10: Arduino UNO

B. The Following Are The Components Of The Arduino UNO

1) *The ATMEGA328 Microcontroller:* The heart of the Arduino is a microcontroller called the ATMEGA328. The ATMEGA328 was originally intended for industrial automation systems, and working with it directly requires advanced electrical engineering and programming skills. The Arduino was designed to make programming and connecting devices to the ATMEGA328 microcontroller much easier.

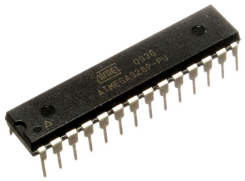

Figure 1: ATMEGA328 Microcontroller

2) *Gpio Pins:* The pins on the board's top and bottom are GPIO (general purpose input and output) pins. External circuits, sensors, and other devices are connected to the Arduino using GPIO pins.

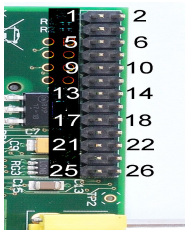

Figure 2: GPIO Pins

3) *Digital Pins:* Digital pins can provide a high (5V) or low (0V) voltage (0V) signal to external components and devices. Some of the digital pins have special functions that will be explained below. The digital pins are labelled 0 to 13.

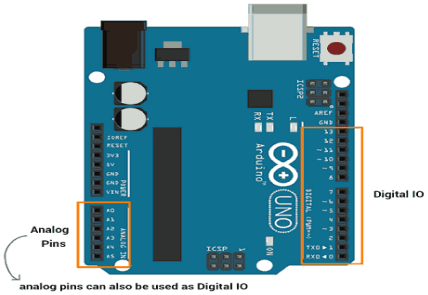

Figure 3: Digital Pins

4) *TX and RX Pins:* The TX and RX pins are used for UART communication

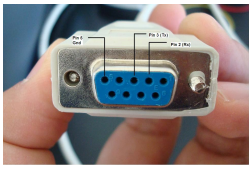

Figure 4: TX And RX Pins

5) *Reset Button:* The reset button re-starts the Arduino and makes the sketch start over from the beginning

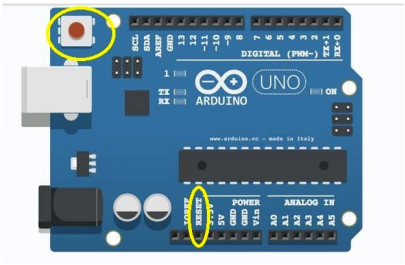

Figure 5: Reset Button

Crystal Oscillator : The crystal oscillator gives the Arduino the ability to keep track of time and generate pulse width modulation and serial communication signals. The crystal oscillator is 16Mhz, which means the Arduino can execute binary instructions at 16Mhz, or 16 million times per second.

Figure 6: Crystal Oscillator

6) *Power Input Jack:* The Arduino is powered by the USB cable's 5V supply. A 7v to 12v AC to DC power source can be used to power the Arduino when it is not connected to a computer. The power adapter is plugged into the Arduino's power input jack.

Figure 7: Power Input Jack

7) *Voltage Regulator:* The voltage Regulator down the 7 to 12volt input power to 5 volts, which is the operating voltage of the Arduino.

Figure 8: Voltage Regulator

8) *USB Connector:* Programs are uploaded from your computer to the Arduino using USB communication. Serial data generated by the Arduino is also sent via USB to your computer when it is displayed on the serial monitor. The USB Cable can also power the Arduino while it is connected to your computer. This is the connector for the USB cable.

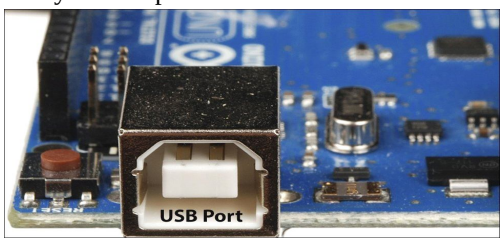

Figure 9: USB Connector

9) *AREF:* From the external power source, A reference voltage is fed to the Arduino UNO board through the Analog Reference (AREF) pin.

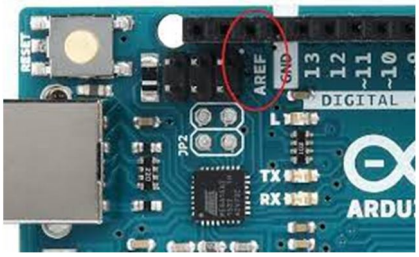

Figure 10: AREF

10) *GND:* The power and ground pins can supply 5 volts or 3.3 volts to external devices and circuits.

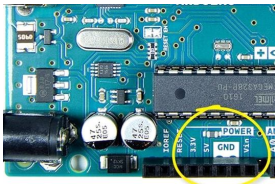

Figure 11: GND

C. Software Components

1) *Arduino IDE:* The Arduino IDE is a user-friendly coding environment that makes programming more accessible to beginners. It's a text processor with coding-specific features, to put it plainly. Auto-formatting is a useful feature for folks who are unfamiliar with how to format code. You can organize the code in a readable format with just a single click of the mouse. Multiple templates are also included in the application, which can be used in the text processor for intricate sketching. The Arduino Software (IDE) outputs text to the console, which includes entire error messages and other data. The configured board and serial number are displayed in the window's bottom righthand corner. The configured board and serial port are displayed in the window's bottom righthand corner. The toolbar buttons can be used to validate and upload program, create, open, and save sketches, and open the serial monitor.

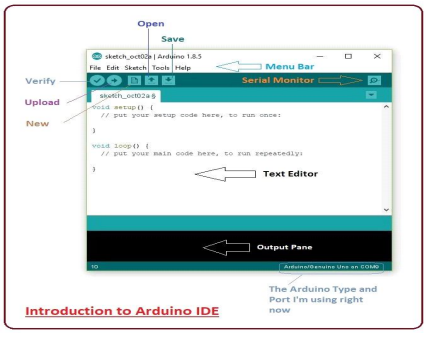

Figure c.1 Arduino IDE

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Volume 10 Issue VIII August 2022- Available at www.ijraset.com

VII. IMPLEMENTATION METHODOLOGY

When a coin is entered into the coin sensor, the coin is validated and a signal is sent to the Arduino. The signal will be sent from the Arduino to a 16x2 LCD display. The LCD shows the length of time it will take to charge the coin in minutes based on the coin. The phone will then be charged dependent on the quantity of valid coins in the battery.

The system's operation is depicted in the flowchart below:

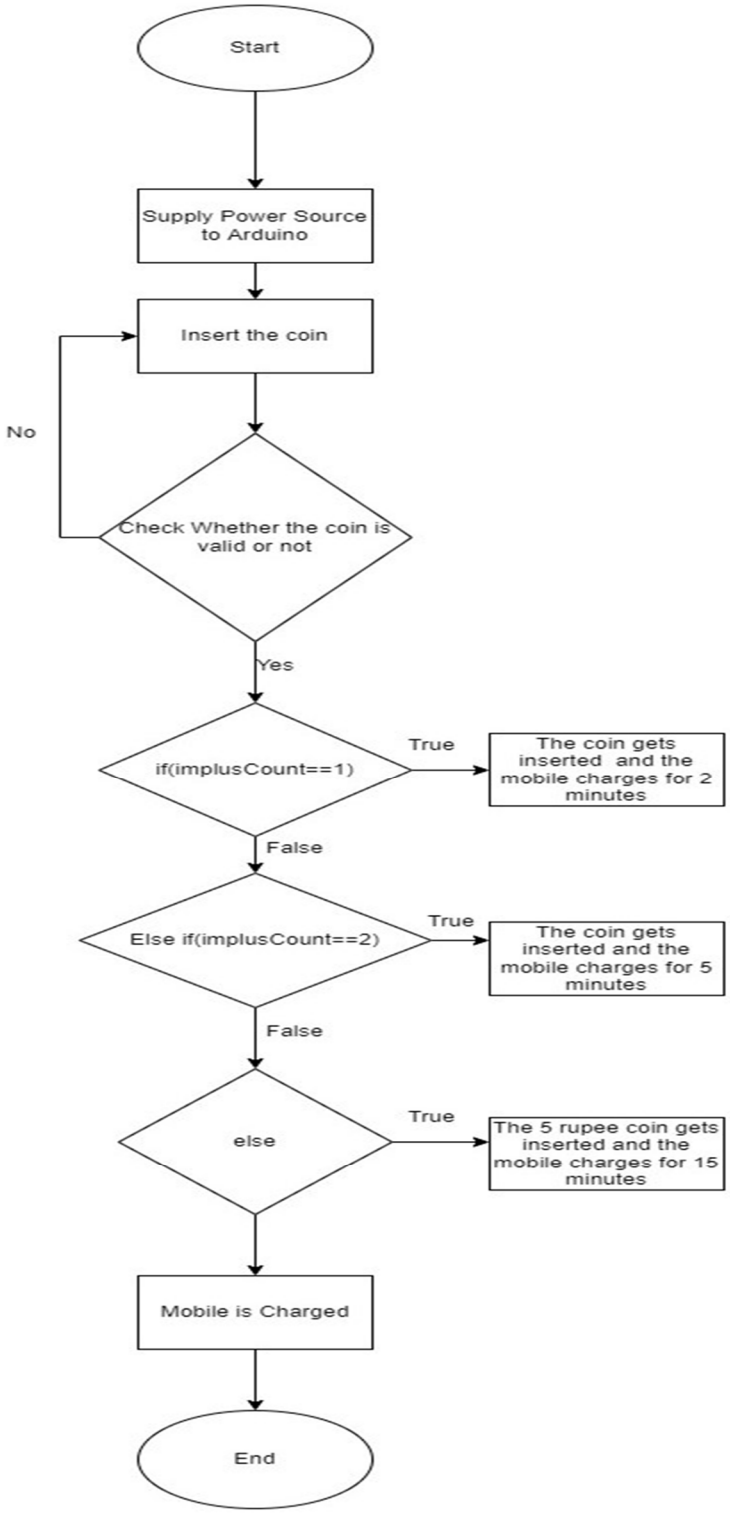


Figure 7.1: Flow Chart of the system

Algorithm:

Charge Mobile Algorithm (coin)

Coin is the input.

Charging the mobile phone is the output.

Process:

1. Start
2. Supply power source to Arduino
3. Insert coin
4. Check whether coin is valid or not.
   4.1 if coin is not valid the coin return back to coin slot.
5. If coin is valid.
6. If (impulse Count==1)
   6.1 The coin gets inserted and mobile charge for 2 minutes.
7. Elseif (impulse Count==2)
   7.1 The coin gets inserted and mobile charge for 5 minutes.
8. Else
   8.1 The 5rupee coin gets inserted and mobile charges for 15 minutes.
9. Mobile charged.
10. Stop.

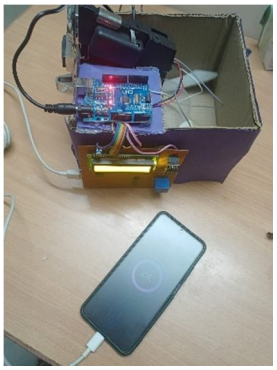
VIII. APPLICATIONS

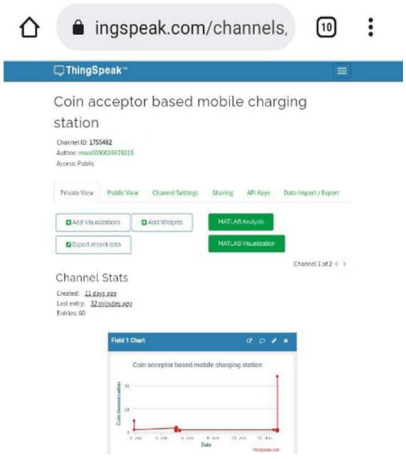
1) It can be installed in public places like hotel, conference, center servied office, leisure centers, retail , oulets, in vechicles etc
2) It can charge a variety of mobile devices.
3) It can be utilised for charging in an emergency.
4) It can be implemented in offices and colleges to allow for payment charging.

IX. ADVANTAGES

1) Reduce the wastage of electric power
2) Less Expensive
3) Installation is easy
4) Simple to operate
5) It can be usefull for travelling .

X. OUTPUT SCREENS





XI. CONCLUSION

The new manner of offering chargeable services to the general public is described in our article. For the convenience of users, coin-based mobile charging stations have been erected in a number of public locations. It is also less expensive and more convenient for long-distance passengers.

XII. FUTURE SCOPE

In our work, we provided coin based mobile charger Arduino, relay, coin sensor, WI-FI module which gives updates for number of coin entries. Furtherly, we can also develop this as revenue generator by implementing GUI application.

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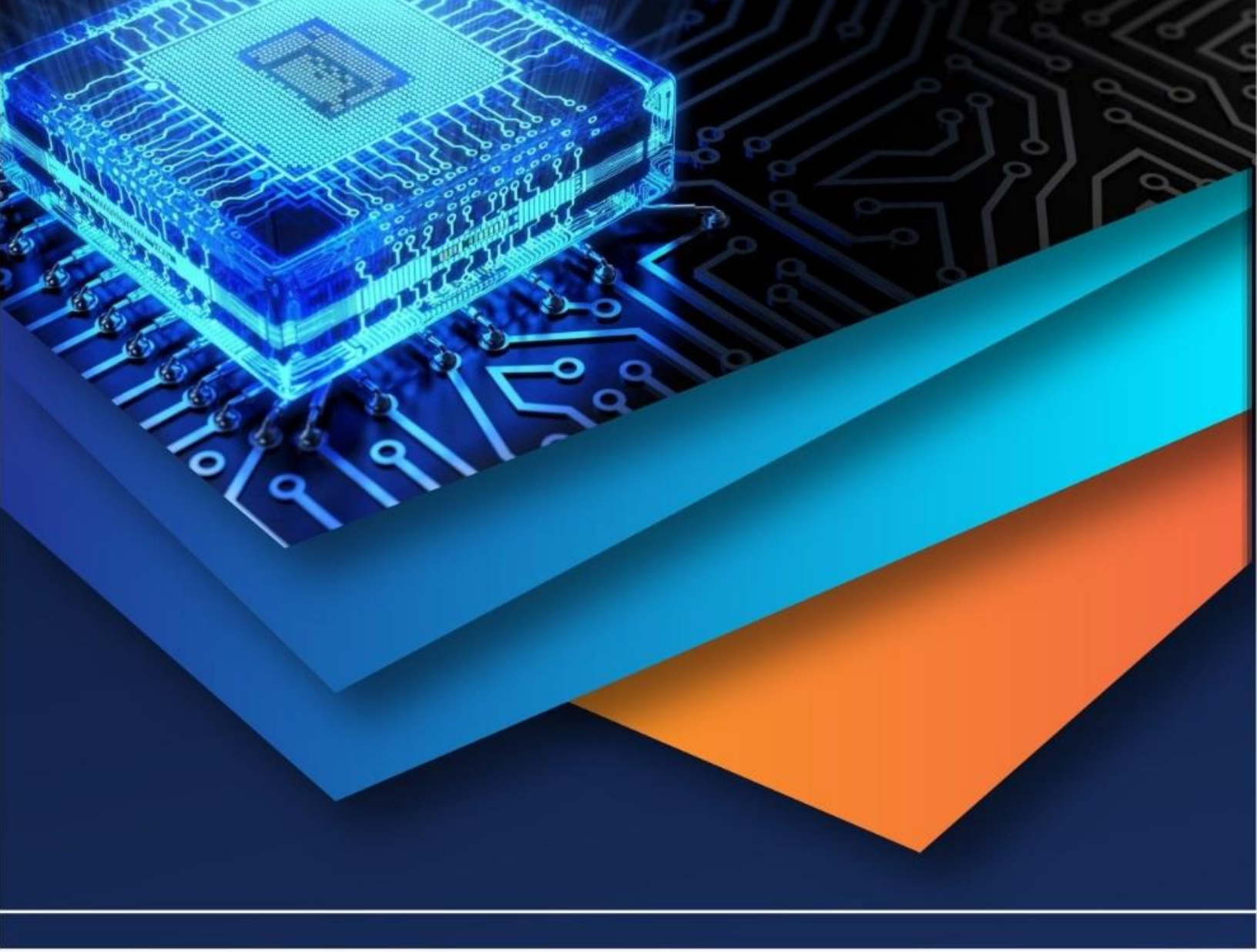

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