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Smart Billing System Using Arduino

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Abstract: ***The modern technology has increased the standard of living for the humans. With the advancement of technology, the level of acceptance of people of all ages towards electronic gadgets is increasing steadily. Electronic gadgets such as barcode scanner smart card reader and RFID scanner are gaining more and more usage in various kinds of industries. So with the help of these we came up with this innovative project is of an automated billing system which can be placed at a side where the customer is flexible to use at any time. This automated payment system consists of a RFID reader which is controlled by Arduino. So, whenever the customer places the tag it is detected by the RFID module and is displayed on LCD along with the price of the item. As the customer goes on adding items, all items are detected by the module and therefore the price will increase accordingly. In case if customer changes his/her mind and doesn't want any item added to the bill he/she can remove it and the price added will be deducted automatically. At the end of the entire process the total amount to be paid will be displayed. We can also pay the bill using the mobile application in the app itself. The mobile application is operated by the Wi-Fi module used in the hardware implementation. After the payment the bill will generate successfully. Hence this technique is an appropriate method to be used in places like hotels so this will help in reducing manpower and helps in making a better billing experience for customers.***

Keywords: Arduino, RFID, Wi-Fi module, LCD, MIT APP.

I. INTRODUCTION

Metropolitan cities are crowded with people in hotels, malls to full fill their daily needs. As the market is growing bigger day by day with variety of products and consumer taste has changed. Hotels are becoming center of attraction because of variety of foods which are all available under one roof. The concept is designed into a smaller Page | 2 version of the automated self-checkout system in a hotels with a user interface screen which allows users to make payment for items scanned. The main aim of the project is to satisfy the customer and to reduce the time spent on the billing process. So in this project we focuses on updated technology of RFIDS, where in hotels every item is attached with a RFID tag and this product is scanned using RFID module. As the user goes on adding items, all items are detected by the module and therefore the price will increase accordingly. In case if user changes his/her mind and doesn't want any item added to the bill he/she can remove it and the price added will be deducted automatically. Once selected items is over, price of that total items and also names will be displayed on LCD screen which is also attached with equipment. The main propose of this bill management system project is developing a system that automate the bill submission and bill approval task. In big organization bill submission is very tiresome work and it is time consuming. Normally, in present system, user have to work manually to maintain bill records and it is very difficult to know the status of the submitted bill. So in this project we developed to manage the bill submission process in hotels. Using this system user can submit their bill online and check the status of their bill. In this system user can submit their bill to their manager online.

II. LITERATURE SURVEY

As per our knowledge only few papers were found in the literature for the automated shopping trolley for supermarket using RFID. The automated shopping trolley for supermarket billing system implemented by Sainath (2014), exploited barcode for billing of products, where customer scans the product using barcode technology. The bill will be forwarded to the central billing system where customer will pay them by showing unique id. The limitation of barcode scanning requires line of sight for scanning and it should be fixed within its boundary. Cash register lines optimization system using RFID technology by Budic (2014), developed a system for shopping using RFID.

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The RFID is employed for scanning products and the information is stored in the database which could be paid online or in a central bill. It also uses web application to maintain entire shopping details. It requires maintenance of web application server. No necessary steps have been taken for the products that are accidentally dropped into the trolley by the customer. IOT based intelligent trolley for shopping mall by Dhavale Shraddha (2016), applied RFID technology for billing during purchase in shopping malls and IOT is used for bill management by means of ESP module. The payment details will be sent to the server by which central billing unit will deal with customer's payment.

III. METHODOLOGY

An RFID tag is attached to every item in the menu list. At the time of billing, the tag attached to the item is scanned by the reader. Each tag has a unique EPC. Based on the EPC received by the Arduino, the information of the item is displayed on the LCD along with the updated cost. If the customer wants to remove the item product, the product should be scanned again. Then the cost of the corresponding product will be deducted from the bill. Once buying is over, price of that total items and also names will be displayed on LCD screen. So, in this project we developed to manage the bill submission process in hotels. Using this system user can submit their bill online and also can check the status of their bill.

IV. PROPOSED SYSTEM

The Arduino is interfaced with all the remaining components. Once the microcontroller is powered up with the use of a 9v battery it is initialized and set to the basic settings, now the system is ready to proceed which means the RFID card and the tag can be scanned. Then the RFID card or tag is scanned the RFID reader fetches all the details from the scanned card or tag, and if the scanning process is successful the product details will be transferred to the microcontroller's memory and then will be transferred to the LCD module to be displayed on the LCD screen. Here the RFID module uses the SPI communication technique to transfer or to retrieve the data from the RFID card or tag. After the shopping is completed the entire bill details will be displayed on the LCD screen, each card or tag acts as a product, where the product details are pre early set or dumped into the card. When the bill amount is paid, the shopping details will be sent via the sim900 GSM module to the prescribed customer's mobile number. The entire working process is implemented by the software called Arduino IDE. The Proteus simulation software is used to check the simulation results before the hardware implementations.

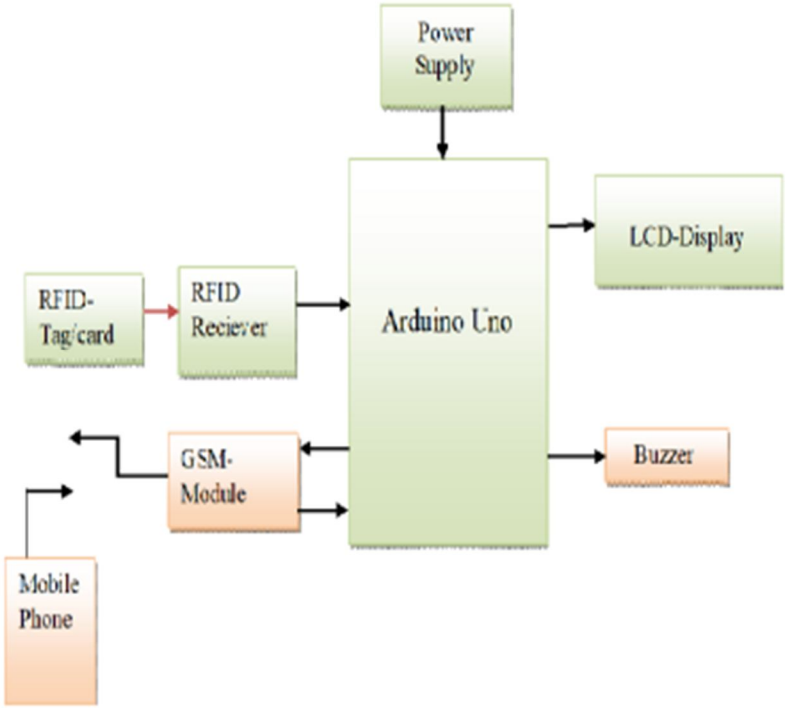


Fig 1: Block diagram.

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V. RESULTS

A. *Circuit Board for Smart Billing System.*

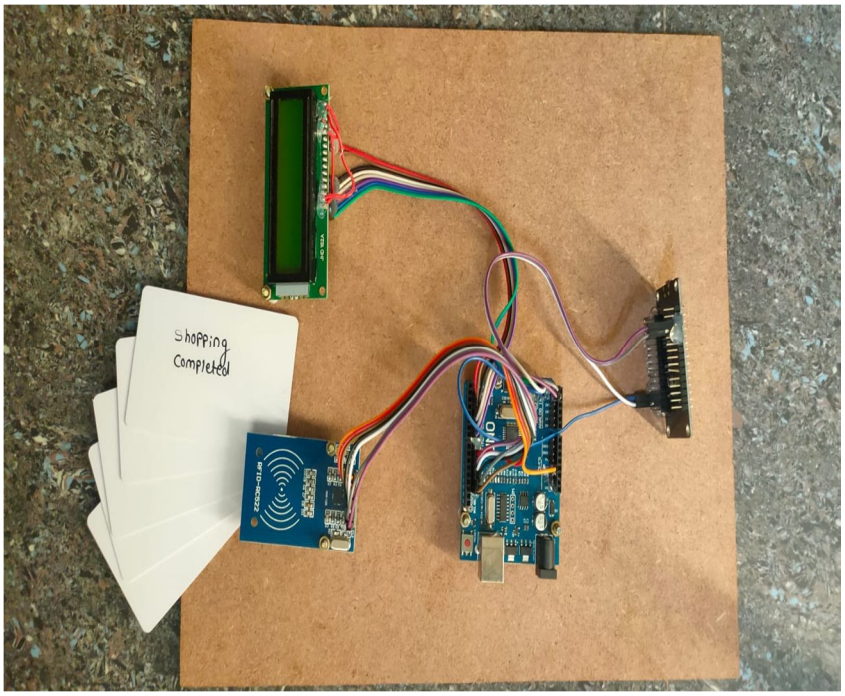


Fig 2: circuit board.

B. *When the Power is given to the Circuit*

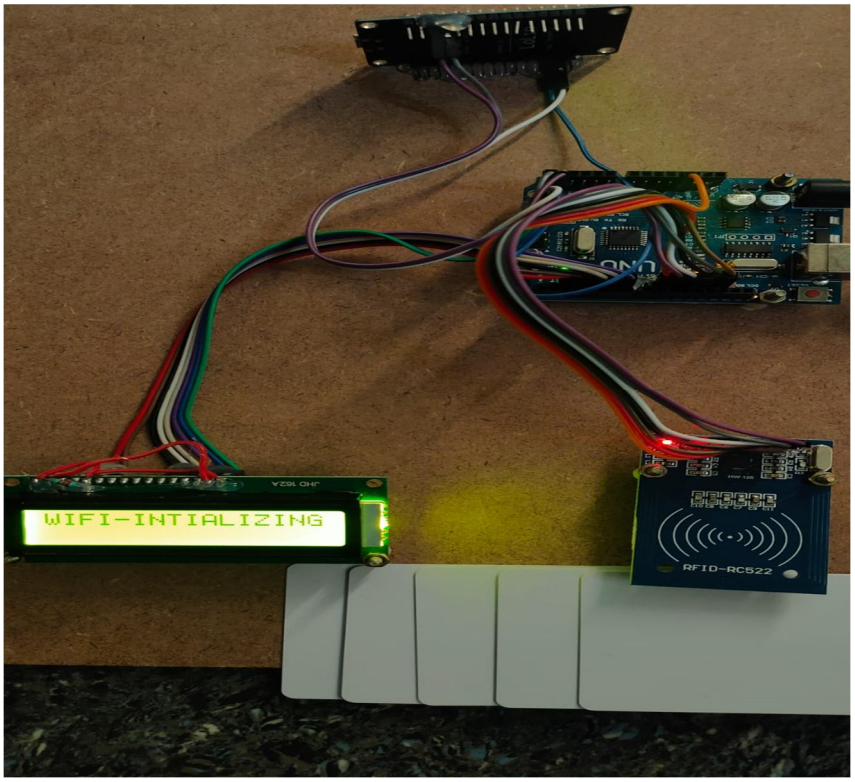


Fig 3: Wi-Fi initialization.

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C. After Wi-Fi Initialization the LCD Display Shows

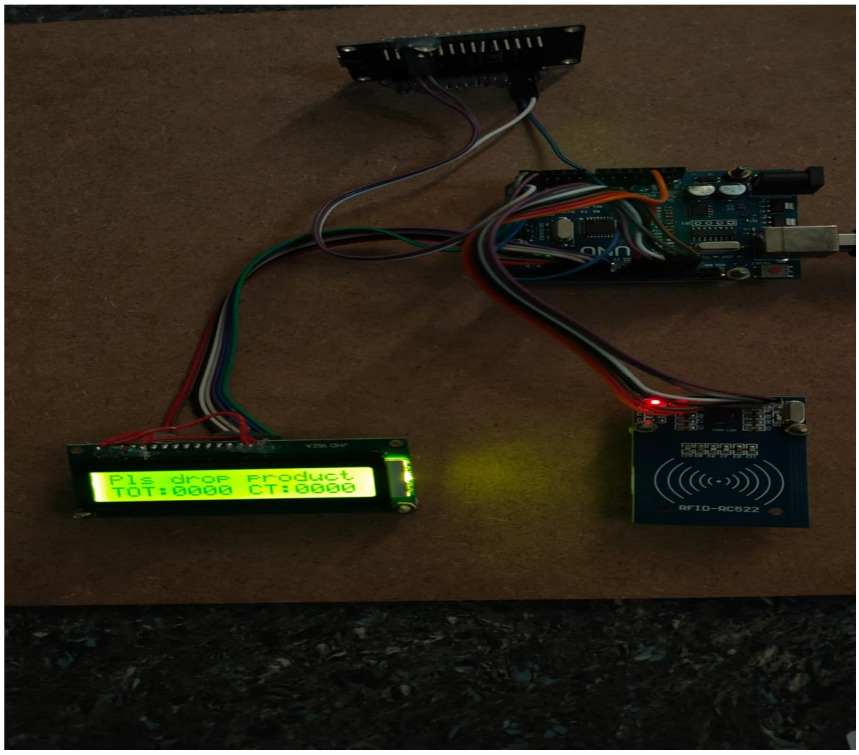


Fig 4: Taking the input.

D. After Items are Scanned and Displayed on LCD

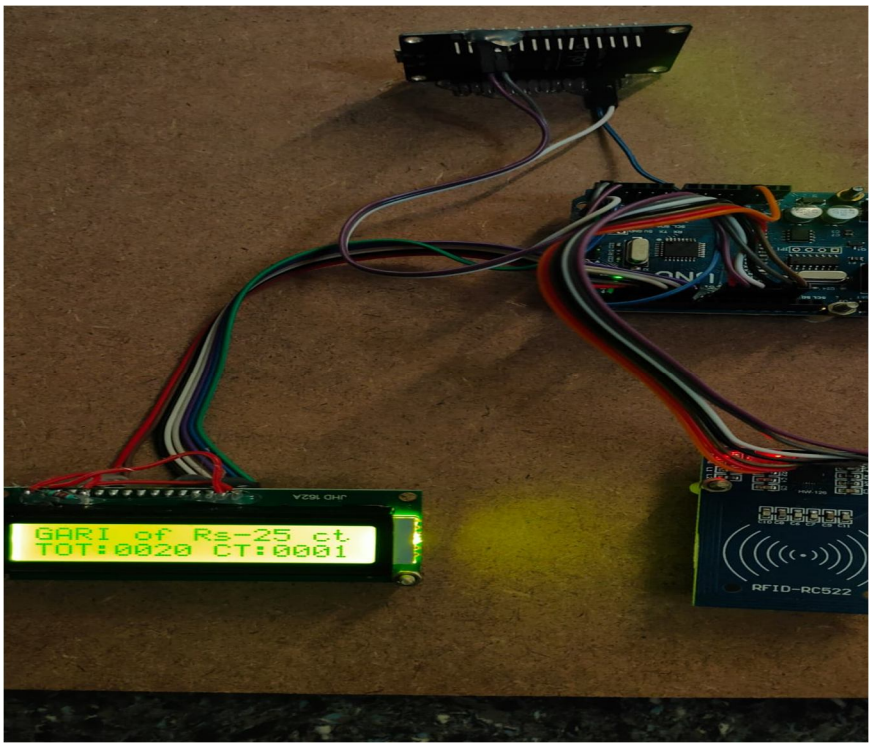


Fig 5: Total cost and count of items.

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E. After the Purchase is Completed

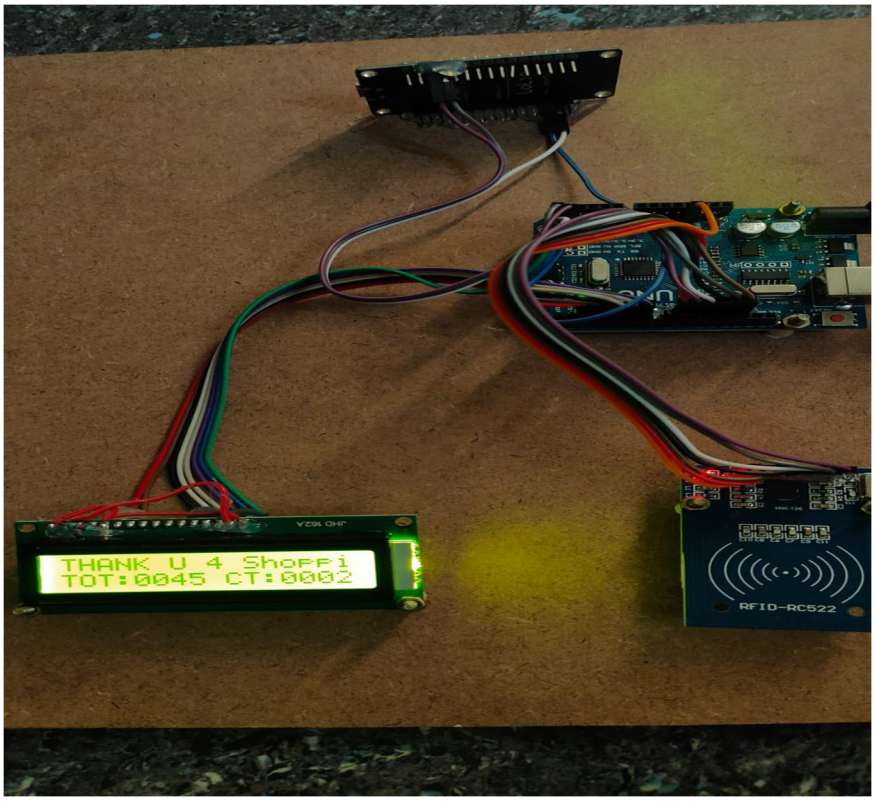


Fig 6: Thank you for shopping.

F. Bill Payment using MIT App

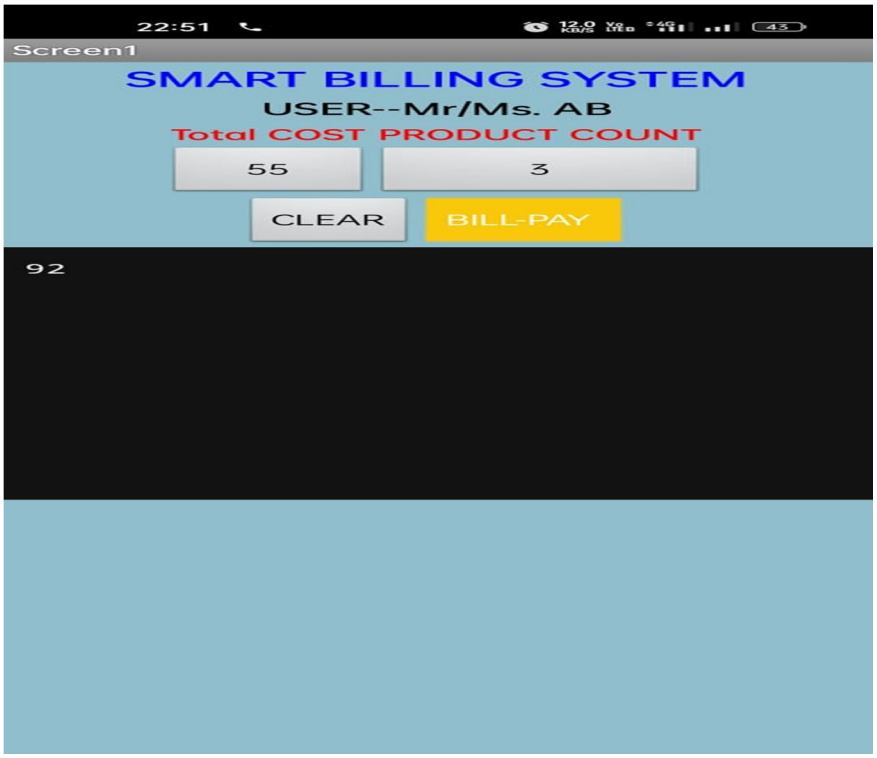


Fig 7: Bill payment using mobile application.

V. CONCLUSIONS

This project aims at study of the work done with the help of RFID technology, RC 522 reader and Arduino. Its aim to easy for the customer and management at counter section for change. So that the customer gets benefited as well as the management and the same time inventory management becomes so easy. It can be implemented anywhere where there is a large crowd and huge rush. Automatic billing system plays a major role in the upliftment of technology. Hence this technology can help people to make their lives easy and time saving too.

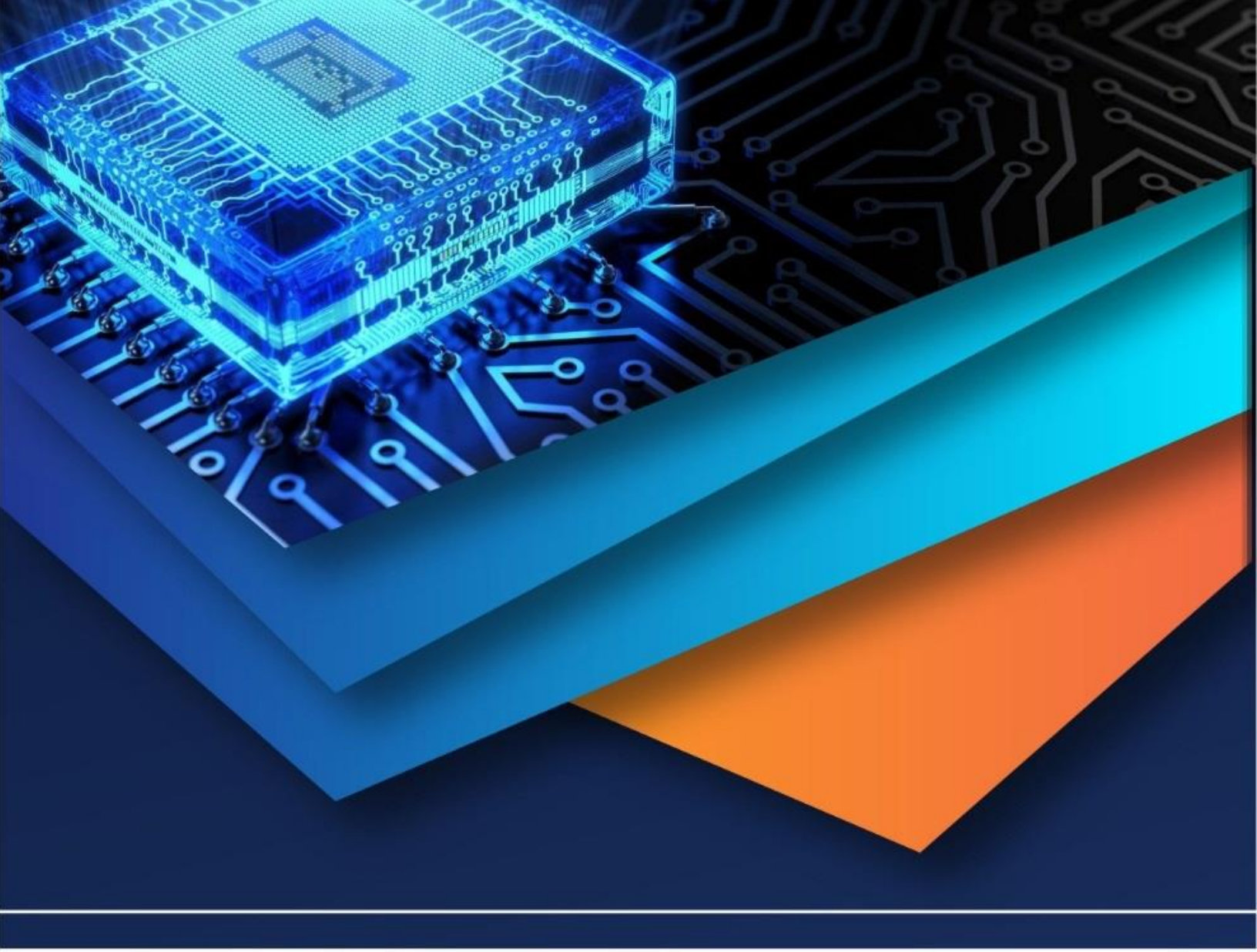
VI. ACKNOWLEDGMENT

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