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IOT based Smart Trolley

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Abstract: ***Shopping in big malls is routine activity to the people in metro cities. Noticeably huge rush at malls on holidays and on special discounts and customers should wait a lot of time for billing. Proposed system can be used to reduce the time of customer. Fix the RFID Readers to the trolleys and RFID tags with products in the mall. When the product is placed in the trolley, the RFID tag is read and the name and cost of the product will be displayed on the LCD and is stored in the memory. The RFID Reader communicates with the server in the Mall through the wireless module and send information of products in the trolley. The billing information is prepared in the server and that information will be sent directly to the billing counters. When Customer reach to the billing counter, the entire billing amount reflected in the computer then pay the bill without waiting.***
Keywords: RFID tag, RFID reader, Arduino, LCD, Trolley.

I. INTRODUCTION

Shopping mall could be a place wherever individuals get their daily requirements starting from food merchandise, clothing, electrical appliances etc[1]. Continuous improvement is needed within the ancient request system to enhance the standard of searching expertise to the purchasers. currently a day's numbers of enormous in addition as little searching malls has exaggerated throughout the worldwide thanks to increasing public demand & disbursement. [2] At the time of festivals, special discounts, holidays, etc[3]. there's a large rush in searching malls. the utilization barcode reading technique in such things perpetually ends up in waste time since client must wait until whole things get scanned.[4] this technique uses RFID technique rather than barcode. planned system uses separate RFID reader for every self-propelled vehicle and RFID Tag for every product.[5] once client buys any product RFID reader reads the tag that is gift on the merchandise. the price of product and therefore the total bill of searching things will be displayed on 16*2 alphanumeric display.[6] IOT primarily based sensible self-propelled vehicle given here is simple to use and doesn't needs the special coaching to customers. RFID technique has several benefits over barcode systems [7]. Reading frequency of RFID is forty tags. victimization this technique, client can have the data concerning worth of each item total worth of the things [8]. So, use of this IOT primarily based intelligent self-propelled vehicle for searching malls is useful for client in addition as homeowners. [9] Zigbee module is employed during this IOT primarily based sensible self-propelled vehicle that helps to scale back the specified hardware and additionally offer the $64000-time data.[10]

II. RELATED WORK

In the existing system, bar codes ar used for scanning the merchandise details wherever the shoppers tend to attend in long queue for generating the bill followed by payment. At times, the bar codes would are broken which explicit product can not be scanned by a barcode scanner resulting in confusion. Also, every and each product has got to be scanned manually. it consists of a lightweight supply, a lens and a lightweight device translating for optical impulses into electrical signals. to boot, nearly all barcode readers contain decoder electronic equipment that may analyze the barcode's image knowledge provided by the device and causation the barcode's content to the scanner's output port. Barcode want one website of propagation. Reading frequency of barcode reads is simply 2 tags.

A. Drawbacks of Existing system

1) Barcode scanning requires special device called Barcode scanner which emits light and collects reflected light to decode the Barcode.
2) Barcode scanner or reader works with computers or POS terminals.
3) Barcodes do not have read/write capabilities.
4) It requires optical line of sight (LOS) scanning.
5) It is labour intensive as it requires to be scanned individually.
6) It is less secure compare to RFID which can be easily forged.
7) It is susceptible to environmental damage.
8) Scratched or crumpled barcodes may cause problems while scanning.

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III. PROPOSED SYSTEM

In this projected system, every product can have a passive frequency ID tag that is bearing a singular Electronic Product Code. This Electronic Product Code provides the knowledge regarding the merchandise i.e. its name and value. once the client puts the merchandise within the sensible self-propelled vehicle, the frequency ID reader scans the tag and acquire the Electronic Product Code variety. frequency ID reader passes the Electronic Product Code to the microcontroller. The name and value of the merchandise obtained by the controller gets displayed on the digital display of the sensible self-propelled vehicle, wherever consumer will see the item knowledge. To store the item value and total charge knowledge, microcontroller memory is employed. digital display is interfaced with small controller. it's wont to indicate the customer, the action taken by the customer that's inserting of Associate in Nursing item, removal of Associate in Nursing item, item's value and total charge value of things within the self-propelled vehicle. At the charge Counter, the overall bill knowledge is going to be transferred to laptop through ZIGBEE module. there's no would like of special coaching and is incredibly a lot of straightforward to use.

IV. ARCHITECTURE

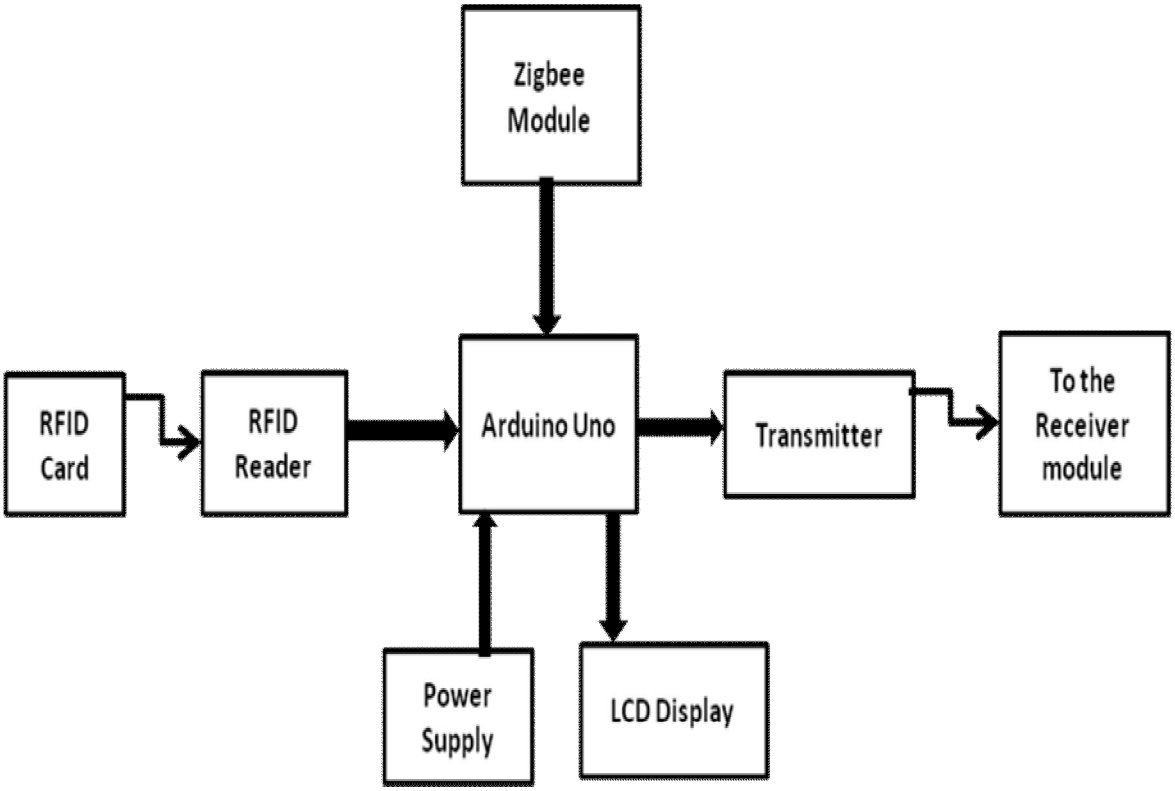


Fig 1: Proposed Architecture

A. Algorithm & Flow Diagram

1) Algorithm

a) *Step 1:* Start the process
b) *Step 2:* Initialize the system
c) *Step 3:* Scan the RFID tags by using RFID reader
d) *Step 4:* Checking whether the card is RFID tag or not. If it is RFID tag then process will be followed.
e) *Step 5:* Read data from RFID tag.
f) *Step 6:* Display data on the LCD.
g) *Step 7:* Add item cost to previous amount.
h) *Step 8:* After the end of shopping then button will be pressed. After pressing the button the total amount transfer to billing counter by using Zigbee module.
i) *Step 9:* End the process

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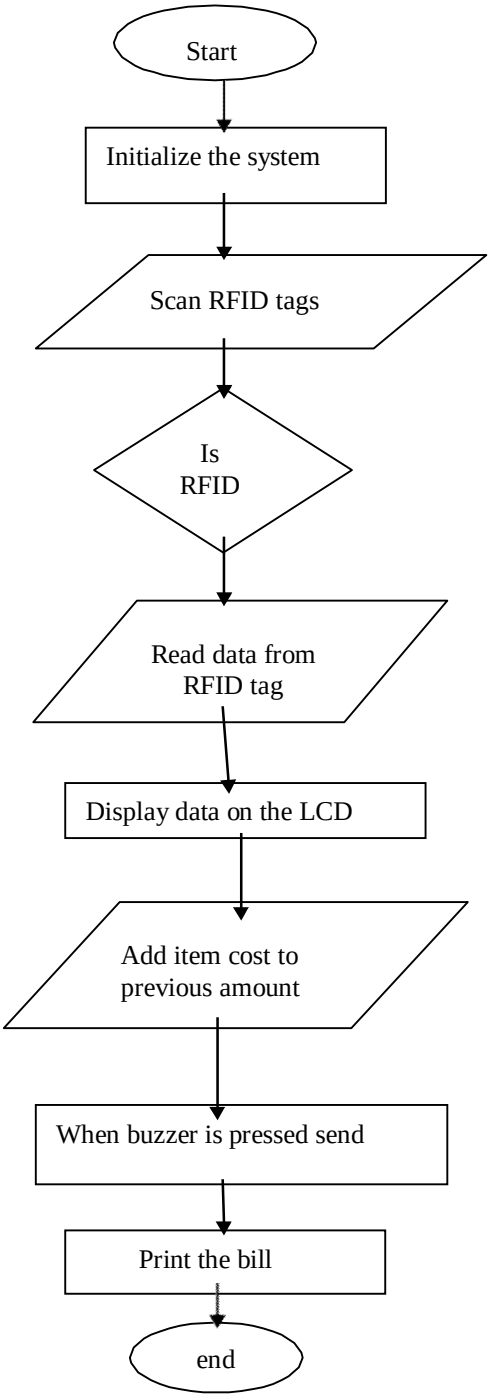


Fig 2: Flow Chart

2) Advantages of Proposed System

a) There is no wastage of time to pay bills by the customers.
b) Customer will get product details at the time of purchasing a product.
c) Easy to use
d) RFID doesn't need line of sight.
e) An RFID tag is read/write.
f) These RFID tags are durable and reusable.

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V. RESULT ANAYSIS

A. *Screenshots*

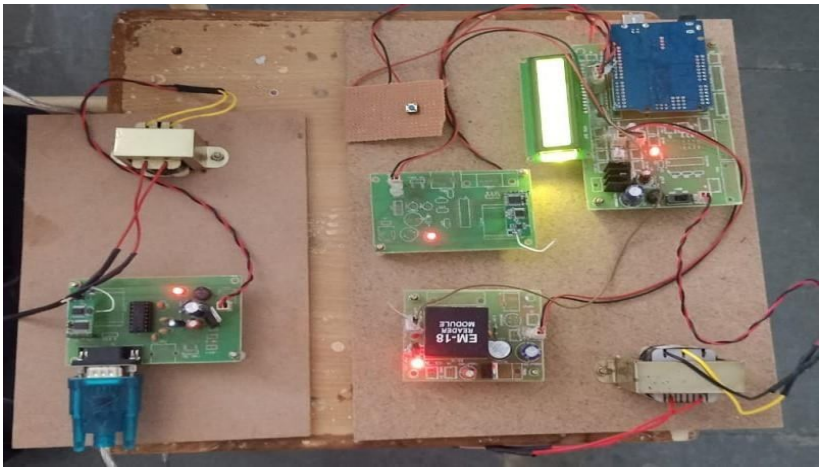


Fig 3: System connections



Fig 4: Initial LCD

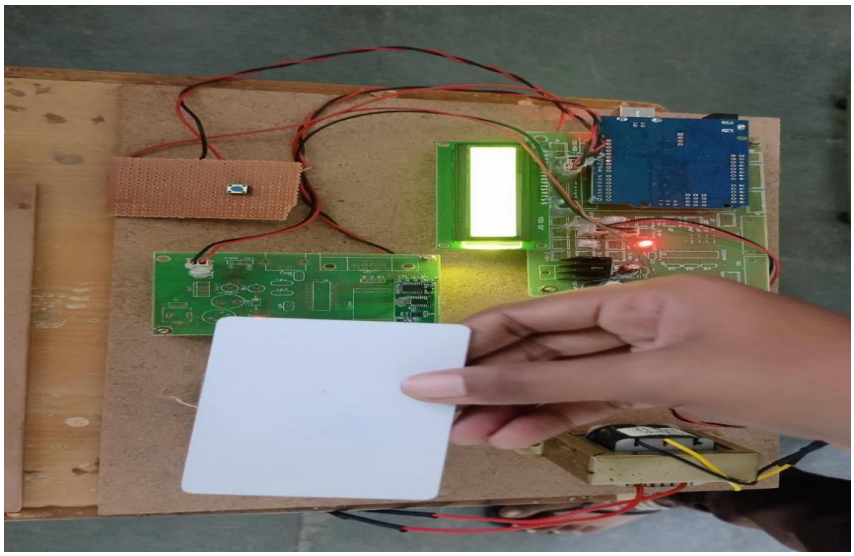


Fig 5: Reading RFID tag

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B. Adding Operation

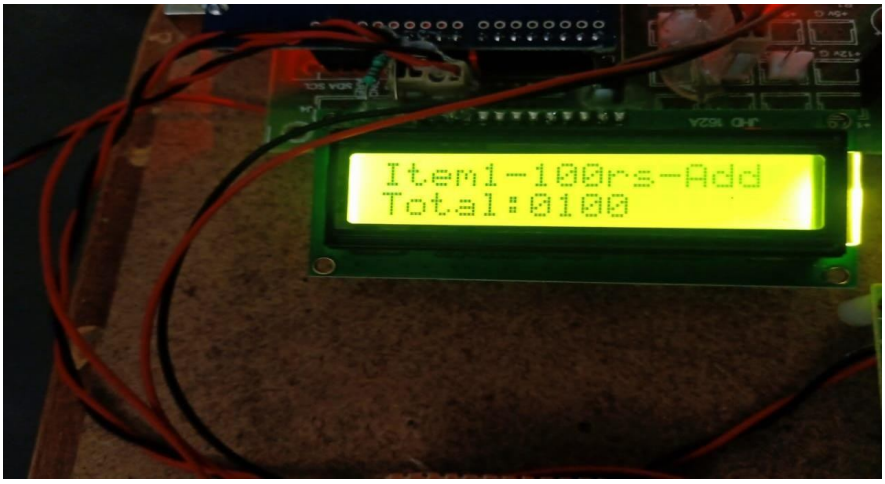


Fig 6: Displaying the Tag name and amount on LCD

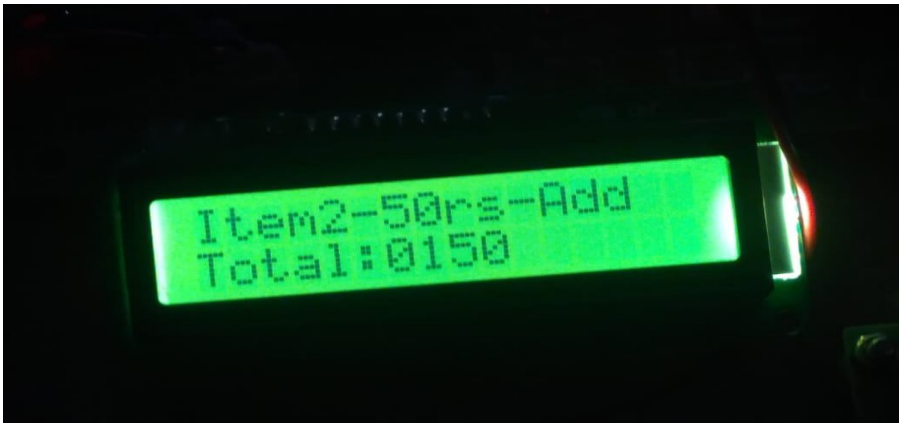


Fig 7: Adding tag2 cost to previous amount and displayed

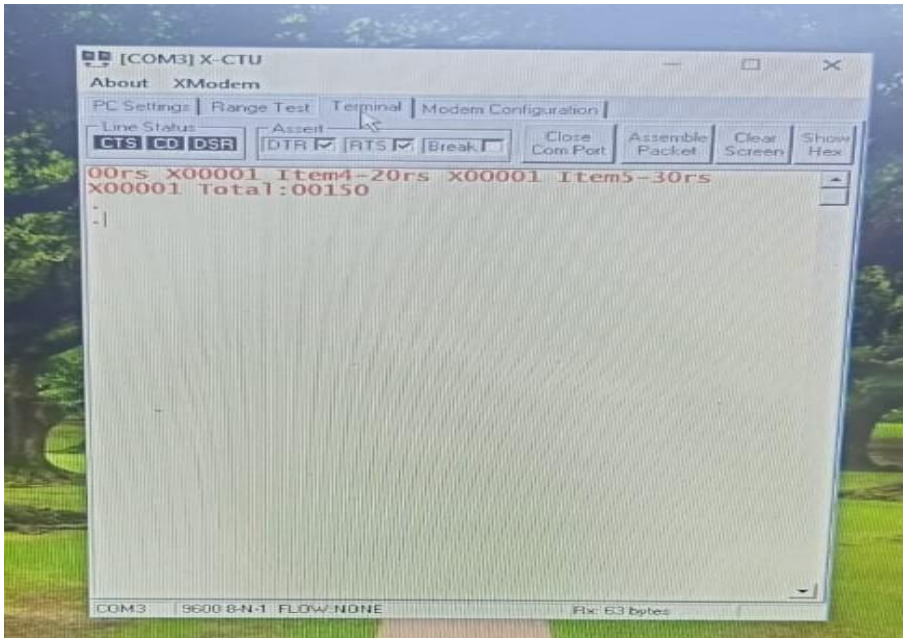


Fig 8: The total amount of the items sent to counter.

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C. Deletion Operation

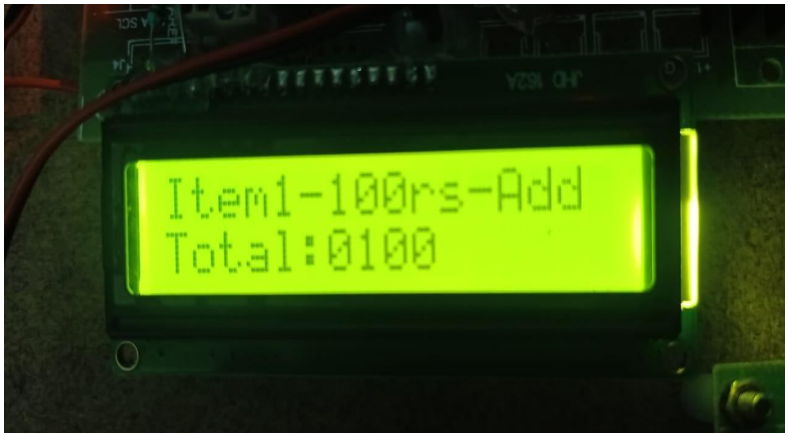


Fig 9: Adding tag 1



Fig 10: Deletion of tag 1

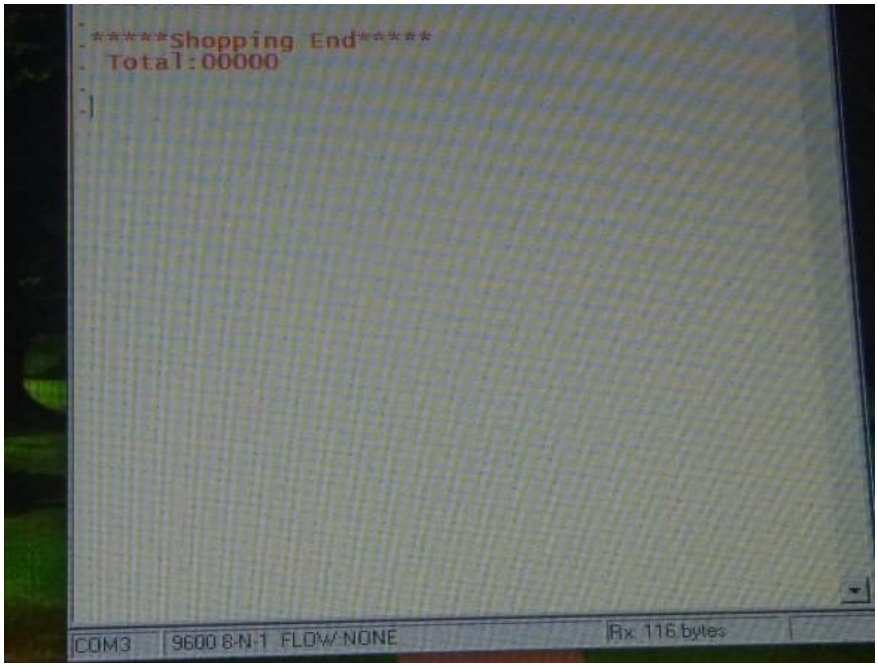


Fig 11: Total amount of the items sent to counter:

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VI. CONCLUSION

We tend to intent to switch the request method & increase the protection victimization RFID technique. The cart has the feature calculate automatically and show the whole prices of all the merchandise inside it. This makes it easy for the consumer to grasp what quantity he or she possesses to pay throughout searching and not at the checkout. One will delete the merchandise from the cart by simply scanning it once more if he or she doesn't wish it. The system planned is extremely dependable, authentic, trustworthy and time-effective. there'll be reduction in wage quantity given to staff, reduction in thievery. Also, the system is incredibly time-efficient. this may take the wanting experience to a special level. the utilization of alphanumeric display during this trolley car build it user friendly. alphanumeric display displays the item range, value of product and total bill. Automatic request is finished in trolley car thus it saves the time of client and scale back the frenzy at request counter. It additionally reduces the person power. the utilization of IOT is useful to the owner to examine the sales.

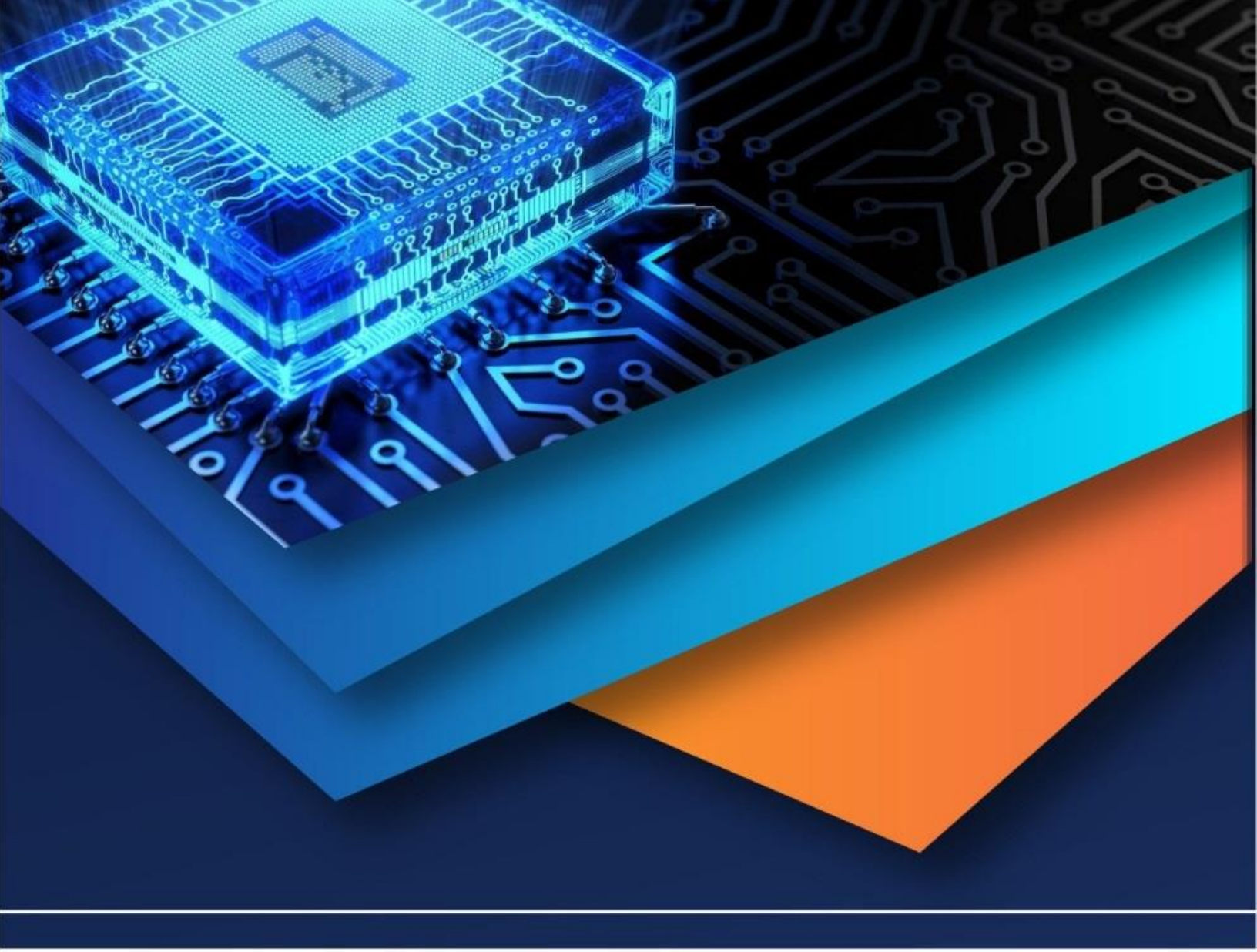
VII. FUTURE WORK

Depending on the RFID reader used, it may scan around seven tags in a very second. additionally, the} major task of avoiding the reading of a similar tag multiple times has also been accomplished by implementing a quiet tag operate. Finally, the request is completed in nearly one tenth of the time needed in barcode primarily based request system as well as the time needed in dispatching the things that embrace removing of tags from the things. Further, in future we are able to foresee to implementing it in searching malls employing a long vary RFID reader. The developed product is straightforward to use, economical and doesn't need any special coaching. This project simplifies the request method, makes it swift & will increase the protection exploitation RFID technique. this can take the searching expertise to a unique level. we are able to add additional options like AI and GPS technology. By exploitation GPS Technology the streetcar will guide you over the searching complicated. It displays you what things area unit gift at a specific place within the shopping center. By exploitation AI for additional simpler usage of the streetcar.

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