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# Smart Shopping Trolley

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**ABSTRACT** - In the modern world, shopping has taken on a daily routine. In many malls, there are long lines of people waiting to be billed. Our project's goal is to solve the issue of time wastage caused by waiting in lines. In order to solve this issue, we are recommending a smart trolley billing system that would audit the purchased goods and make payments automatically online utilizing RFID tags. The product will be instantly recognized and scanned, and the final invoicing is done from the cart itself. In order to save consumers from having to wait in a long line at the register and to let them know when offer zones are getting close to their cart, buzzers sound. This eases a person when offers are available in the zones.

**KEYWORDS:** Smart Trolley, RFID reader, IOT(Internet of Things), Zigbee.

## I. INTRODUCTION

We are currently living in the Internet of Things (IOT) era, in which all physical object interactions have been realized. We used to print invoices on paper, but we finally transitioned to technology. The barcode scanner was used to read and scan the barcodes. In a later part, we focused on the smart billing system that employs RFID tags, which are digital storage devices used for both identification and information recording. The data on RFID tags may be accessed or read by a reader using electromagnetic induction. A user can only utilize the RFID tag if no power is consumed. When a buyer buys a goods, he or she first scans the RFID tag with the RFID reader and places it in the cart. When the consumer scans the RFID tag of the goods, the price of the product is taken and stored in the system's memory. When a person goes shopping in a mall, he or she takes a trolley and after finishing his or her purchasing, he or she must proceed to the counter for billing.

Billing is done through barcodes, which takes long time. We need to scan each and every item based barcode label affixed to that item.

### 1. Goals and objectives:

- I. The goal of this project is to increase the speed of purchase and to conduct a speedy billing system by eliminating queues at billing counters by utilizing the latest technology.
- II. This project is intended to employ an RFID-based identification system in a shopping cart.
- III. The main aim is for the buzzer to beep as the cart gets closer to the offer zone.

## II. LITERATURE REVIEW

### 1. Smart Shopping Cart System:

The intended system should be dependable while scanning items, consistent in giving appropriate replies to operations, and transfer all relevant information to an online database. This article offers a smart trolley system that allows consumers to scan purchases and finish the invoicing process while still in the trolley. The consumer is required to use the trolley and scan the merchandise. If a consumer want to remove an item from his cart, he must re-scan it. After scanning all of the goods, the consumer should proceed to the checkout.



Payments may be made through online applications, and customers can see their balance or transaction information on the shop's website. The system checks for customer or admin after scanning the card. If a customer is discovered, the consumer can buy any item, check their balance, or double touch to return any item. If admin is scanned, you can add a new client, recharge a customer card. These features will save time and make shopping easier. Overall we can gain the best shopping experience.

## **2. A Smart Trolley with Automatic Billing System using Arduino:**

The suggested article focuses on updated RFIDS technology, saving consumers' valuable time by rapid scanning of products and scanning of objects across vast distances. The exaggerated shopping trolley system assists customers in lowering the large amount of time they used to spend shopping, and it also includes real-time information on the records in the store management unit. If a customer wishes to remove a product from the basket that they have taken, they can do it by using a key.

Once the purchase is complete, the entire price will be displayed on the LCD, and billing will be handled through QR code. At the departure point, consignment checks and item wrapping are possible. Various solutions for intelligent purchase trolleys are intended to make shopping in malls/shops less challenging for customers. We have implemented a new approach that eliminates the requirement for a server and eliminates connectivity and communication issues up to 1.8 km. This technique also included the ability to pay bills at the cart itself.

In Existing technology we need more human and material resources lot of time is wasted in scanning the items, making the bills ready and items can be read for shorter distances only, barcodes need external power supply so in order to meet all the requirements of customer we proposed a smart trolley using RFIDS.

## **3. Smart Trolley Billing System:**

After purchasing the goods, the buyer must first scan the RF tag with the RFID reader and then place it in the trolley in the suggested system. When a consumer scans the product's RF tag, the price is captured and saved in the system's memory. If a match is detected, the pricing and product name are presented on the LCD. At the same time, the processor uses the RS232 interface to convey the same information to the computer for billing purposes. In this suggested system, the IR sensor is also used to count the goods for security purposes. There will be no cost product addition in the bill. If an undesirable item is removed from the cart, the bill's count is reduced and the cost is recalculated accordingly. The scanning goal will be accomplished in less time and without the need of human labour thanks to the RFID tag.

The controller will show the product's name and price on the smart trolley's LCD.

This concept uses IOT advances to manage a smart shopping cart that is sensible and profitable. The main objective is to offer a technologically advanced, time-saving, and commercially focused solution for improved shopping encounter. Additionally, this system will offer product recommendations based on customer purchasing history from a centralized system. Every item in the store will have an RFID tag, and every cart will have an RFID reader attached to it under this system. These features will speed up and simplify purchasing. We can get the best buying experience overall.

## **4. Automated Smart Trolley For Super Markets :**

The projected shopping complex system's goal is to issue All trolleys will be given an RFID tag as identification. Likewise, all items will be paired with an RFID tag, which will contain all product details, such as price, amount, and so forth. Customers can use RFID to scan product tags. reader and add the things to the basket using the switch located in The trolley is used to add and remove things. They are capable. During the shopping process, you can change the contents of your basket at any moment. The total number of goods The trolley amount is computed automatically and shown on display. There would be a charging mechanism in place. The consumer would scan their tag ID and the merchandise would be transferred. information for billing. When the consumer has finished shopping, The shopping stop button has been pressed. When pushed, the details of the customer's purchase are shown through Zigbee. Payment can also be done by paying the entire amount.

The proto system aim is to eliminate all the inconveniences as possible from the systems and to make a system, which is consumer kindly, customer-friendly and high performing. The system's aim would be consumer convenience and an overall time efficiency and high performance. This goal could be achieved by using the Zigbee system implemented using RFID technology. Present scenario in shopping supermarkets are, time consumption is big problem at billing section. Consumers have no idea about the present day offers in supermarkets. Sometimes, shopping

is done beyond the budget of the customer. So keeping all these in mind the system needs to be developed which provides customer an easy to use interface and also a way for the vendors to endorse more products alongside and achieve high profit.

### 5. Smart Trolley for Smart Shopping:

The required system must be dependable while scanning items, constant in delivering appropriate replies to operations, and capable of appropriately sending all facts to an online database. We propose a smart trolley system in which customers scan items and finish the billing process within the trolley. The consumer must first take the trolley, scan his card and then scan the merchandise. He must re-scan every product he wishes to remove from the cart. He can go to checkout after all of the products have been scanned. Then he must scan his customer card in order for the money to be deducted from his card. There is also a function to check the card's balance. The consumer can also access invoicing information on the shop's internet page.

The administrator or business owner can also utilize the system with the aid of his master card, which has been handed to him. The authority authorizes recharging the client card using the master card. Only the master may recharge the customer card, write the product details on the RFID stickers, add the customer to the system, issue the customer card, and manage the online database..

## III. PROPOSED WORK

This project's planned workflow might be as follows. The consumer will first take the cart. In this method, the RFID reader is located in the trolley bay where the merchandise will be stored. When a consumer chooses an item, he must swipe it through the card reader and place it in the cart. RFID tags will be attached to each product. The product's price will be saved in it. When it is swiped into the trolley, a little display screen appears, displaying the total cost of the goods in the cart. If a consumer wants to de-select a product, he just swipes it out while holding a button down. Pop-ups will appear on the trolley screen when the trolley gets closer to offering zones.

This functionality may be realized by installing an RF receiver in the cart and having the transmitter in the offer zone emit digital signals at 433MHz, which are decoded by the receiver and forwarded to the Microcontroller to show the pop-ups. When the shopping is finished, hit the Enter button, and when the cart is close to the billing section, it automatically sends the cart number and bill data to the billing counter through ZigBee.

This data will include information about the total cost and the commodities purchased, which may be validated at the billing counter and paid immediately. This lowers the cashier's job of obtaining the product's bar code and then billing it, as well as saving time by skipping the backlog.

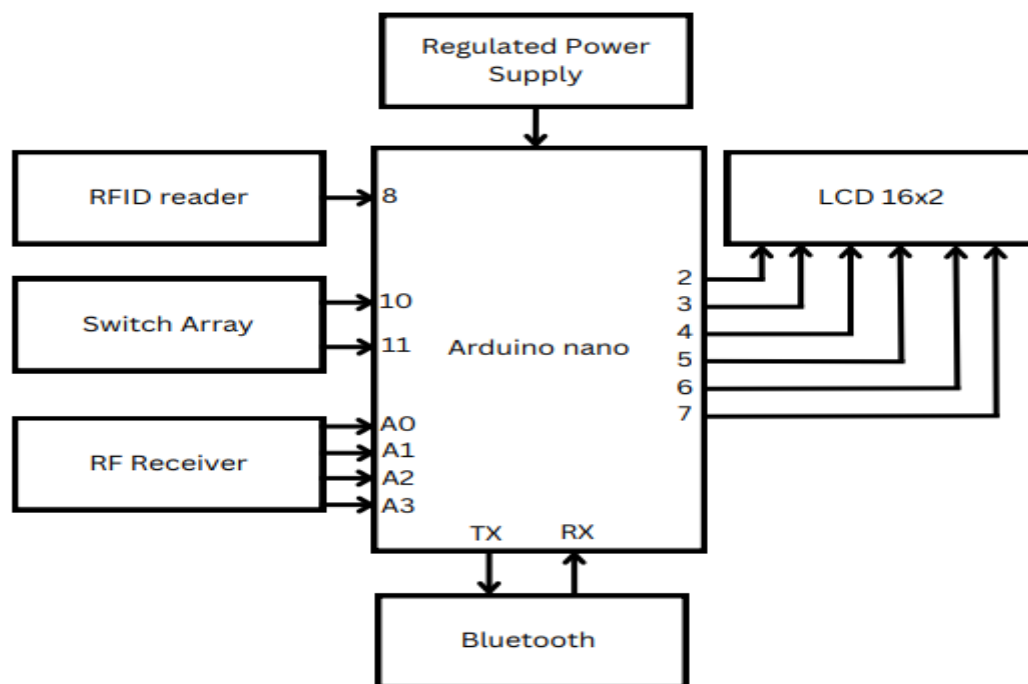


Fig:1 -Block Diagram of Proposed System





#### IV. CONCLUSIONS

The introduction of smart shopping cart was described in this paper. RFID and the Arduino UNO are used in smart shopping. The hardware concept was devised so that clients could pay their bills online without having to wait in lines near the billing counter. Smart shopping has several advantages and applications over traditional purchasing. This system contributes to a speedier billing system. The trolley's Cumulative Budgeting System assists the consumer in anticipating bill specifics so that he may arrange an economical purchase. Helps supermarkets promote their company by getting more consumers and offering rapid service.

This method can be enhanced in the near future by replacing smart cards with facial recognition. Using this, all of the information is saved online, with the customer's face serving as the identification. This simplifies the customer's shopping experience because the products are purchased utilizing the trolley. This automatic billing system plays a major role in the upliftment of technology. This technology will replace the present barcode system which is present being followed. Hence this technology can help people to make their life's easy and time saving too.

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