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# SMART SHOPPING CART USING IOT

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## ABSTRACT

The paper presents an approach to save the time of the customers and expenses in the supermarkets. The design of the proposed smart shopping cart comprises both hardware and software. It incorporates the Scanning Barcode using barcode scanner fitted on cart and generate the bill with the help of IOT on Customer mobile application. We are making use of the Barcode Scanner for the scanning of the barcodes of products. Whenever the customer scan his every product the lid of the cart will open, customer drops his product in cart, after dropping the lid will close and IOT based system will simultaneously generate on Customers mobile. It will reduce the waiting time of customers and expenses of supermarkets for manpower requirement so as to this will help to improve efficiency of shopping malls.

**Keywords:** ESP-32, Barcode Tags, Barcode Reader, LCD, IR, Microcontroller, IOT, Sensors

## I. INTRODUCTION

Every supermarket employ shopping trolleys to help customers to select and store the products. The customers needs to get the shopping trolley, select the products and drop the products in trolley which they wish to purchase and then proceed to billing counter. At the billing point he need to make a bill of it, for that the customer have to wait at the bill counter till he make his turn to make payment. In order to make a billing and payment it takes a lot of time so the waiting time of the customer is more which makes the customer to hesitate the visit the supermarkets again. This is the common procedure followed in supermarkets where the employee of super market will scan all the products in the trolley using barcode scanner which leads to waiting. So we need to develop a system smart shopping cart using IOT with bar-code scanner which will scan every product and after dropping it in cart it will display on screen present on cart and after the shopping done with the help of IOT the total bill can be generate on the mobile application of customer. This will give impetus to the initiative taken by the government in the Make in India for electronics industry.

## II. METHODOLOGY

### a) Existing System

1) The present apparatus is a mobile shopping cart or container that can automatically keep track of objects selected and carried in the cart and provide a customer using the cart information like the total price of the items carried. The cart has a radio frequency cart base station with a cart antenna connected to a radio frequency cart transceiver. Various novel embodiments of the invention produce a radio frequency field within the shopping cart that is used to communicate with radio frequency tags on objects carried in the cart. The tags contain information (object descriptions) about the respective carried object to which the tags are attached.[1]

2) This is a method of using a Smart shopping cart comprising placing an item within an input Zone of the Smart shopping cart, wherein the Smart shopping cart comprises a mobile device holder and an RFID and wherein the cart is shielded with conductive material; Scanning the item in the input Zone with a mobile device having an electronic cart or the RFID reader in communication with the mobile device; placing the item in a removable

container in the Smart shopping cart, wherein the item is protected from outside RF inspection; paying for the item in the electronic cart; and removing the removable container from the Smart shopping cart.[2]

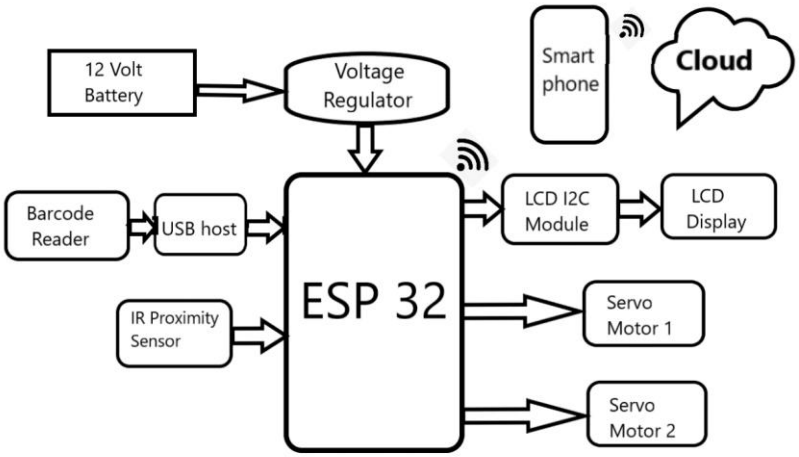
**b) Advantages**

- It reduces manpower required in billing section. This can reduce the expenses incurred by the management.
- Customer can be aware all the time about total bill amount during the time of purchase.
- It reduces time spent by customer at billing counter and increases customer satisfaction.

**c) Proposed System**

The project is basically used for the Shopping purpose. Customer only needs to scan QR code present on cart by his mobile application then the cart will be activate. Initially the lid of the cart will be closed, whenever the customer scans the every product using barcode scanner present on the cart the lid of cart will be open and after dropping product the lid will close. Without scanning the lid won't open. The amount and product drop notification will be seen on LCD screen present on cart. After Scanning of every product the lid will open and product will be dropped inside the cart. The operation of opening and closing of Lid of cart will be done with the Servo Motors present on both the sides. With the help of IR sensor present inside it will be sensed that the product is dropped with the dropping movement the lid will be close. The dropped product will be added to the bill which is simultaneously generating for every product after scanning on mobile application of Customer. This operation will be done with the help IOT. Finally the customer will clear his payment easily.

**d) Block Diagram**




## III. COMPONENTS AND SOFTWARE

**Components:**

- ESP-32 Board
- Barcode Scanner
- Barcode scanner-USB Host
- IR Sensor
- Voltage Regulator
- Servo Motor
- LCD display
- Battery

**Software:**

- Arduino IDE
- Proteus

**Hand tools and fabrication machines:**

- Soldering iron (generic)
- Solder Wire, Lead Free

- Tape, Double Sided
- Trolley
- Hot glue gun

## IV. RESULTS AND DISCUSSION

**Fig:** Hardware implementation

Taking into account the changing trend in shopping in today's market we come to a conclusion that the IOT based Smart Shopping Cart is most certainly a needful equipment for the supermarkets for fast billing, time consuming of customers and reducing the manpower expenses. The system makes use of IoT technology where barcode scanner is connected to the microcontroller. Whenever a customer scan and drops the product in cart then the microcontroller commands the wifi and it will send billing information on Customer mobile as well as to the main server of supermarket. After shopping done the customer can also pay the bill using UPI payment QR code present on the cart and the main server of supermarket can get the details about the bill paid or not.

## V. CONCLUSION

We successfully validated the effectiveness and advantages of our proposed IOT based smart shopping cart methodology by doing software and hardware testing. Each module used in the system of the program was verified with various test cases. We programmed the device through ESP-32 efficiently. Though the project was developed for institutional level, it can be extensively be used on a large scale with incorporating certain modifications. The goal of this project was to make smart and time consuming Shopping, now there is no need for the customers to wait in the queue and wait for their turn for the scanning and billing of the products. The customer only needs to do scan barcode of product before dropping it in the cart and the bill can be generate on his mobile through mobile application. Using this concept of smart shopping, supermarkets can attract the more number of customer as their new business strategy. The future scope is wide as per its use as it stands to be the greatest issue for time being.

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