

# Intelligent Shopping Trolley and Billing System Using Arduino Uno

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**ABSTRACT:** The modern technology has increased the standard of living for the humans. This resulted in large crowds at shopping malls. To handle the large crowd, we must reduce the process of the billing time. This is done using intelligent shopping trolley system based on RFID. Items that are put in an intelligent shopping trolley are read one by one and the bill is generated and displayed. After the final bill is generated, the customer pays the bill by using their pre charged cards provided by the shopping mall. The aim is to reduce the time consumption needed for the billing system.

**KEYWORDS:** ArduinoUno, EM-18 RFIDModule, Switch,LCD, WIFI Module.

## I. INTRODUCTION

Presently, the shopping system used in the shopping malls is the Barcode System. This system has replaced the previous manual system but has limitations.

To begin with, barcode system requires the barcode on the products to be in the line of site of the barcode scanner. Its scanning range is just from a few inches to a few feet. A barcode scanner can read products only one at a time. Barcodes define the type of every product but can't do it uniquely. Barcodes are read only type and can't be overwritten. The barcode system runs on optical (laser) technology. Barcodes also require a considerable amount of man power and human effort.

Barcodes can get damaged easily. Not only this, the current Barcode system requires the customer to stand in long queues in order to get their products scanned and their bills generated. This process can prove to be tiresome and it also consumes a lot of time of the customers, thereby adding to their frustration. With so many disadvantages to it, Barcode system is still in use. It is obvious that

there is a need to bring on a smarter and a more efficient system.

## II. OBJECTIVE OF THEPROJECT

In the present-day shopping system one of the difficulties is to follow queue through the billing process which is time consuming. Hence this project aims to reduce the average time spent by the customer at the shopping mall by implementing automatic billing system using RFID technology.

## III. OUTLINE OF THEPROJECT

The main aim of the project is to satisfy the customer and to reduce the time spent on the billing process which is to complete the billing process in the trolley rather than waiting in a queue even for one or two products. The customers must add the products after a short scan in trolley and when the shopping is done the RFID amount will be displayed in the trolley.

Customer could either pay their bill by their pre-recharged customer card provided by the shop. Finally, the whole information will be sent to central Pc of the shopping mall.

## IV. PROPOSEDSYSTEM

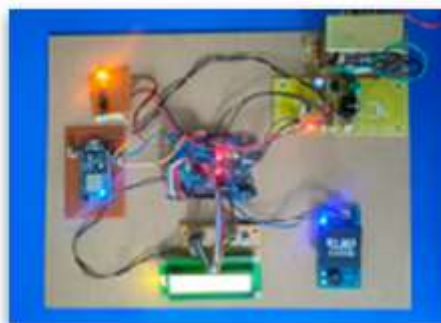


Fig1. Proposed System

The intelligent shopping trolley system consists of trolleys that are incorporated with RFID readers and in all the commodities present in the shopping complex a RFID card is separately attached that has distinctive RFID number. As soon as the customer place the product they want to buy into the cart, the RFID reader attached to the cart detects the RFID card number of the product to identify it. Each RFID card number is linked to the product it describes. All the information regarding the product associated with the RFID card is stored in the database which can be retrieved using a centralised server. All the activities are coordinated together using a controller. The cart will have a number when user picks the cart then all the cart login information is displayed on the web application. The application is dynamically updated as and when the customer places the bought commodities into the cart. The informative details of the commodity is flashed on the screen attached to the trolley. The addition and removal of the products from the trolley is managed by the switch. When the switch is green then the read RFID tag product is added to the cart. And the price is displayed the LCD display. To remove the product from the cart the switch is changed to red then when the RFID reader reads a tag of product then the product is removed from the cart. And the updated price is displayed on the LCD display. When the customer finishes shopping, he/she has to swipe the pre charged card which initially contains 500 rupees and then increase as if needed again and the server calculates the total bill which would be displayed on the web application. The customer can pay the bill online or through mobile wallet. After the payment of the bill, the database is updated and the user can leave the store.

### V. BLOCKDIAGRAM

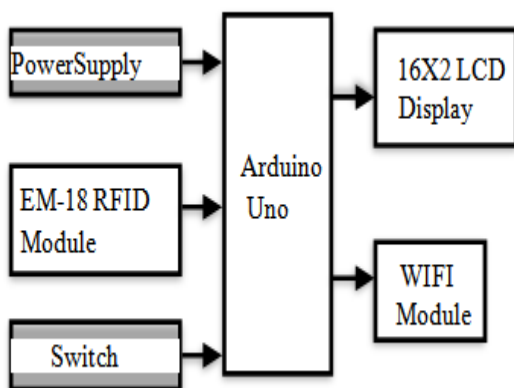


Fig2. Block Diagram

### VI. SCHEMATIC DIAGRAM

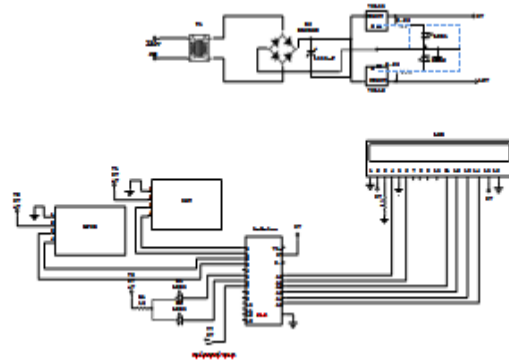


Fig3. Schematic Diagram

### VII. STEPS

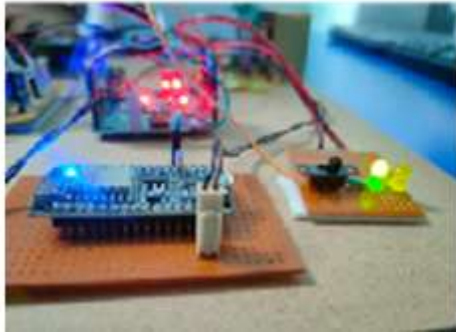
- Step1:** Start
- Step2:** Take the trolley.
- Step3:** Put the item attached with RFID tag into trolley.
- Step4:** RFID reader reads the tag information
- Step5:** The Arduino sends this information to the server via the WiFi module.
- Step6:** The server stores the information in the database.
- Step7:** The total bill is calculated dynamically in the web application. **Step8:** Final Bill get displayed in the web application
- Step9:** If the user wants to remove the product from cart then he/she need to change the switch then it will turns to red color. It indicates that the products which are read by RFID reader are removed.
- Step10:** If the user is done with shopping user proceeds with payment of the bill.
- Step11:** The payment gateway is proceed according to the user.

### VIII. RESULTS

The results of the project ‘Smart Cart Using Arduino and RFID’ is as follows:



Fig4. Displays when system is on



**Fig5.** Green Color LED indicates that when RFID reader scans product and adds to cart



**Fig9.**After removal of product price and the total price of cart is displayed on LCD Display



**Fig6.**Displays the price of the product and the total price of product.



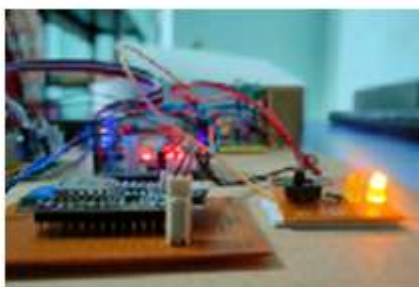
**Fig9.**After Payment



**Fig7.**Addition of product and displays the product price and the total price of cart



**Fig10.**Shows when Cart is Empty



**Fig8.**Toggle the switch then it changes to orange which indicates the products read by RFID reader deletes the product from cart.

### IX. ADVANTAGES

- Reduces time by prevent the problem of long queues at the billingcounter.
- Reduces manpower required in billing section.This can reduce the expenses incurred by themanagement.
- Users can be aware of the total bill amount during the time ofpurchase.
- Reduces time spent at billing counter and Increases customersatisfaction.

## XI. APPLICATIONS

- The project is mainly used in the shopping malls.
- Used in grocery shops.

## X. CONCLUSION

The Work done with the help of RFID technology, EM-18 reader and Arduino. It's aim is to reduce the time of billing in long queues so that the customers gets benefited and the same time inventory management becomes so easy. It can be implemented in shopping malls where there is a large crowd and huge rush into malls.

In the world of Automation, 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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