

# SMART TROLLEY

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**Abstract.** Traditional way of shopping has been changed and people prefer shopping in malls or markets as they get discounts and attractive coupons etc. This is increasing the crowd at malls and the working manpower is not sufficient for it resulting in long queues and time consuming billing process. To overcome this situation we have designed a smart trolley. It consists of a device which will be placed on every trolley. This device will have a mini screen and camera, with the help of the camera the barcode of the product can be scanned while adding a product in the trolley. The bill will be displayed on the screen throughout the purchase. Finally the total bill will also be displayed on the billing counter. This system will help to reduce the long queues and will ease up the billing process.

## 1 Introduction

Shopping malls are the attractions for people now days. Whether it is the shopping of luxurious things or the products of daily use people prefer the shopping malls and supermarkets. Having all required things at one place makes the shopping easy. Due to growing population in cities shopping places are getting crowded, we can find a lot of rush, especially on the weekends. As a result of this customers have to wait in long queue for billing. The manpower at the billing counter is insufficient at times. This leads to a lot of chaos and bad feedback from customers.

Trolleys are provided in every shopping market. Here, a device will be placed on the trolley, the customer will have to pick up the product he/she wants to buy, scan the barcode of the product using the device's camera and the bill will be displayed on the screen. The bill will consist of information like serial number, name of the product, quantity, and price. With every purchase the same procedure will be followed and the bill will be updated accordingly, customer can see updated total of bill throughout the purchase.

Customer has to give the trolley number displayed on the screen to cashier and bill will be displayed on cashier's display, as the bill is ready, the customer simply needs to pay and checkout.

## 2 Related work

Looking at growing crowd in supermarkets and need for smart work in day to day life, work has been carried out in this field.

According to a research paper [1] The idea of the project was to save time and provide availability of the product, the project was designed as Smart Trolley which contains a SmartPhone and Arduino. This project introduces a new concept of the SmartCard which works only for the members those who avail it. The customer must have a smartcard to avail the smart trolley. This project mostly focuses on the main motive was to increase the number of customers.

According to a research paper [2] The proposed solution of the project was to give the location of the product as in shopping market customer gets frustrated to locate items, so the main focus was on locating the item. To overcome the problem they came up with the Mobile Application as well as a Centralized and Automated Billing System. For building up the trolley different hardware were used such as RFID tag, Product Identification Device (PID) that contains a Microcontroller, LCD & RFID reader and for transferring the bill history a bluetooth module is used.

According to a research paper [3] This paper was more targeted to reduce the time taken during the billing process. The module of the project is the same Scanning the product and Displaying the total amount of the bill on the screen. The billing system is fully automated which reduces the possibility of human error. The project used Arduino platform and Xbee modules.

According to a research paper [4] The project's main aim was to satisfy the customer and also reduce the time spent on the billing process. Same method is used for scanning and displaying the bill. This project involved different types of payment methods such as online transaction through different platforms. Hardware used for this project is Shopping trolley, RFID, ATMEGA32.

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According to a research paper[5] The project's main aim was to save time at billing counters and make shopping easy. This project introduced a new feature that a customer can get the shortest route to pick-up the listed items present in different racks in the mart .The project also introduced cart-to-cart communication that allows customers to share their shopping list with co-shopper for parallel shopping. The project used RFID tags and ZIGBEE modules.

### 3 Proposed System

Digitization and modernization is the need of an era. Consumer is seeking for easy lifestyle in his/her hectic schedules. Growing rush in markets, waiting in long queues is the tedious job to do. Consumers from all class shops in shopping malls, making the system easy and without any extra effort for the consumer are a preferred idea. This project have device which will be placed on the trolley itself. The customer's work will start and end in shopping mall, no extra knowledge or efforts are required.

#### 3.1 Customer End

Customer will take the trolley and start shopping. As he picks up any product, he will scan it using the camera; the product will be added in his online cart. Same process is repeated each time he adds a product to the cart. The total bill will be displayed on the screen during the entire shopping time. As a result the customer can remove any unwanted product if his budget is exceeded.

#### 3.2 Billing End

Now at the billing counter, customer has to just tell his trolley number and entire bill is generated on the cashiers screen. Customer has to just make the payment and checkout.

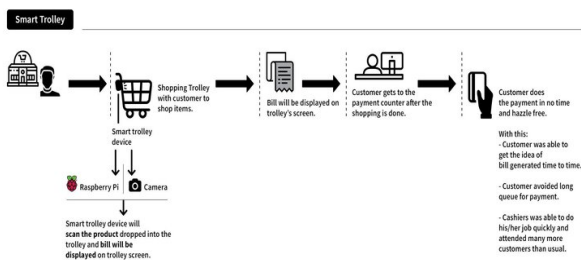


Fig.1. User Journey Diagram

#### 3.3 Hardware used

The hardware used is raspberry pi 3B model, LCD display and camera unit. The raspberry pi is connected to a LCD display and a camera. The camera scans the barcode and the screen displays the bill.

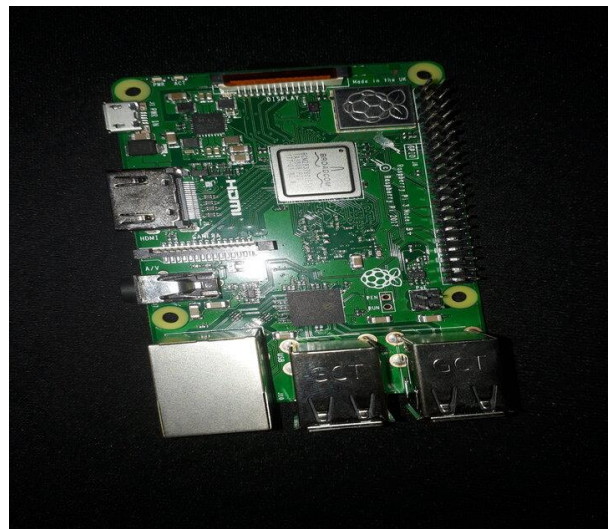


Fig.2. Raspberry Pi



Fig.3. LCD Display & Camera

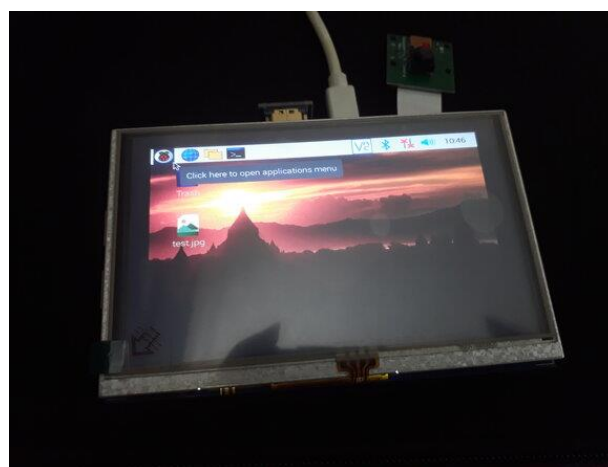


Fig.4. Hardware connectivity

### 4 Results

This system is making the work simpler for customers as well as for the administration. Smart trolley works

efficiently when there is huge rush at the store. It is convenient for the customer and gives him a hassle free shopping experience and saves a lot of time.

## 5 Conclusions

The development of model and implementing the idea was successful. This project can be taken to the next level by adding more features in it like the security aspect can be solved.

This project is feasible and easy solution for making the shopping field more digitized as well as user friendly.

This system is not only making the shopping easy but also the administration can do the work more smoothly and at a fast pace.

Employability is increasing due to required manpower for maintenance and customization of device according to the supermarket's own requirements.

## 6 Future work

In future security aspects can be added in this project so that theft issues can be eliminated. Additional features like location of items in the market can be displayed on the device itself, making the locating of items easy for customers.

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