



SMART SHOPPING TROLLEY

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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 smart shopping system based on RFID. Items that are put in a smart shopping cart are read one by one and the bill is generated and displayed. The aim is to reduce the time consumption needed for the billing system.

I.Introduction

In our day-to-day life, we see that the use of computing technology and innovative applications have increased rapidly. Many people are connected to this digital world through their smartphones and laptops because of the high speed internet connectivity, user-friendly interface, and personalized recommendation. This has made things simpler and easier. The new technology such as social media has given the users a better and broader perspective of many items and information about various products in their daily life and ensures that they are of the best quality.

As our cities are overpopulated, the diversity of wants and needs of the people are also huge. As a result, many people prefer to go to malls and supermarkets to buy different varieties of commodities. The major drawback here is the people coming to shopping malls and supermarkets are huge in number, resulting in large queues for billing. Customers have to wait for a long time in a queue for scanning their items and paying the bill. In this system, an inexpensive RFID tag is embedded within each product. When the product is placed into a smart cart, the product detail is automatically read by the cart equipped with an RFID reader. Hence, billing is made from the shopping cart itself preventing customers from waiting in a long queue at checkout.

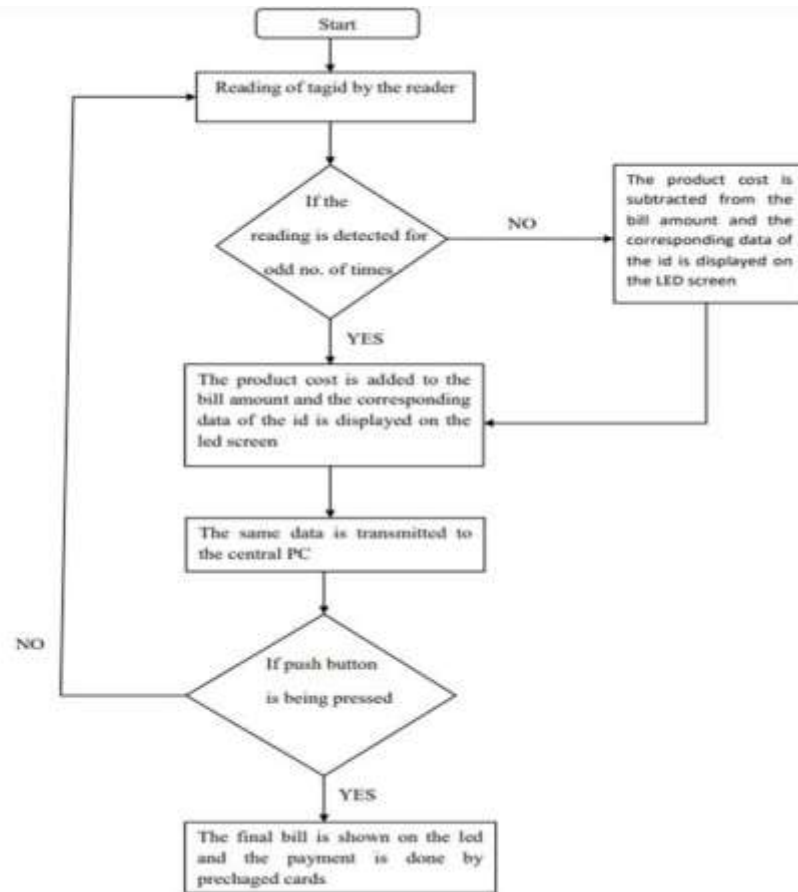


figure 1. basic flowchart

II. RELATED WORKS

Simply attaching RFID tags to the products and a RFID reader with a LCD display on the shopping trolley. With this system customer will have the information about price of every item that are scanned in, total price of the item and also brief about the product. This system will save time of customers and man power required in mall and cost associated with the product.

III. LITERATURE SURVEY

2.1 Existing System

It has an RFID reader which scans the product which has an RFID tag in it. The billing is done in shopping trolley only. Smart Cart using Arduino consists of RFID sensors. The RFID reader reads the tag in the product side by side amount is transferred to the billing desk. By which hardcopy is issued after the payment.

2.2 Issues in Existing System

It is a time-consuming process to scan details of each n every item. Customers try to estimate the bill total manually before the actual billing takes place. Customers have to wait for a long time in queues to get the billing process done. Barcode scanners need a clear vision of the barcode to scan with efficiency. To read the barcode the barcode scanner must be rather near to it but its shouldnt be more than 10ft. Barcodes dont have the feature of read/write capability. While customers have to wait for some time the barcode scanner retrieves the product information. Every single product must be scanned physically which is a time consuming and hectic process.

IV. DESCRIPTION OF COMPONENTS

In this project, there are various modulus which work with Microcontroller by interfacing. The components are:

LCD display, RFID Reader, RFID Tag.

LCD Display

- Interface with either 4-bit or 8-bit microprocessor.
- Display data RAM
- 80x 8 bits(80 characters)
- Character generator ROM
- 160 different 5 7dot-matrix character patterns.
- Character generator RAM
- 8 different user programmed 5 7 dot-matrix patterns.
- Display data RAM and character generator RAM may be Accessed by the microprocessor.
- Numerous instructions
- Clear Display, Cursor Home, Display ON/OFF, Cursor ON/OFF, Blink Character, Cursor Shift, Display Shift.
- Built-in reset circuit is triggered at power ON.
- Built-in oscillator.



figure 2. LCD display

RFID Tag

An RFID tag works by transmitting and receiving information via an antenna and a microchip — also sometimes called an integrated circuit or IC. The microchip on an RFID reader is written with whatever information the user wants. Passive RFID tags use three main frequencies to transmit information: 125 to 134 KHz, also known as Low Frequency (LF), 13.56 MHz, also known as High Frequency (HF) and Near-Field Communication (NFC), and 865 to 960 MHz, also known as Ultra High Frequency (UHF). The frequency used affects the tags range. When a passive RFID tag is scanned by a reader, the reader transmits energy to the tag which powers it enough for the chip and antenna to relay information back to the reader. The reader then transmits this information back to an RFID computer program for interpretation. There are two main types of passive RFID tags: inlays and hard tags.



figure 3. RFID tag

RFID Reader

RC522 is the highly integrated RFID card reader which works on noncontact 13.56mhz communication, is designed by NXP as low power consumption, low cost and compact size read and write chip, is the best choice in the development of smart meters and portable hand-held devices



figure 4. RFID reader

BLOCK DIAGRAM

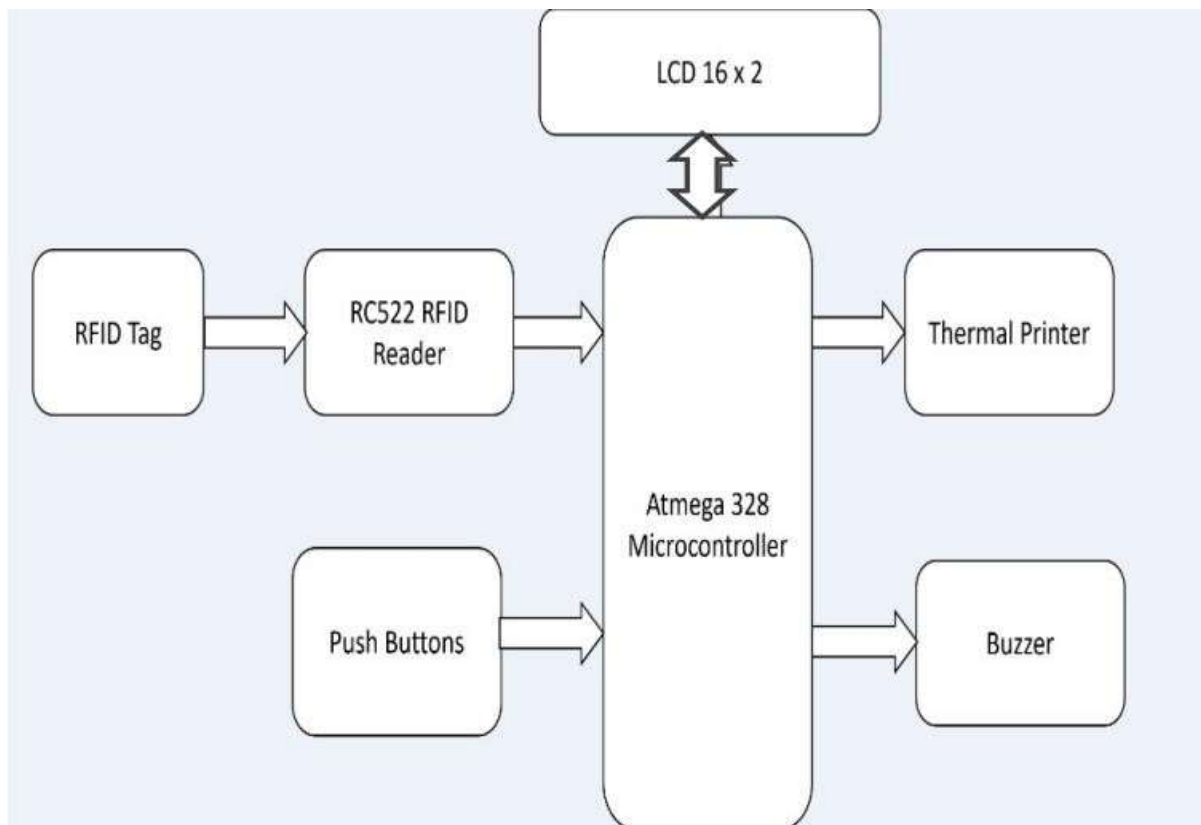


figure 5. block diagram

METHODOLOGY

The main focus of this study is to facilitate both supermarkets and customers. The proposed Architecture of this study provides the hardware and software solutions that help the supermarket to improve the quality-of-service issues and eliminate the time-consuming process of the shopping. The retail industries invest further in exploring the potential of these technologies for the novel services for their customers. These novel services attract a huge number of customers that increase revenue as well. The innovation of the proposed study is the architecture model and services that come together to provide eco-friendly services in cost-effective manners. Our proposed system will allow customers to interact with the products, The customer can also get his/her previous shopping history, the shopping list management modules are added to the Mobile Application which help the customer to manage the shopping list and get the best product according to his/her preference. This experimental prototype is designed to eliminate time-consuming shopping process and quality of services issues. The proposed system can easily be implemented and tested at a commercial scale under the real scenario in the future. That is why the proposed model is more competitive as compared to others. RFID system embedded with a shopping cart that helps the consumer to purchase desirable and cost-effective products. As mentioned above, an RFID system consists of three main parts RFID reader, RFID electronic tag and central communication device. Arduino microcontroller allows the android application to directly communicate with product information that is stored in the RFID product tag. There is an android application based on a user-friendly and attractive display connected with the RFID system. This application provides services to the consumer i.e. display the product information, previous shopping history, manage a current shopping list, product promotions, special offers and RFID based login process for better security. When products come near to the RFID reader in the shopping cart. The consumer can interact with product information. This information extracted by mobile applications from backend databases stored in the server system. The consumer can also interact with previous shopping history, product promotions, and special offers. That helps the consumer to remember products to purchase, manage shopping list and can get the best products according to the preferences. The customer can check the cart in the android application to go through the products which are purchased till now and they can see the grand total of the purchase and get to the conclusion based on the budget and buy any more products they need within the budget. When the customer as purchased over his/her budget then he/she can delete the product in the cart present in the application and remove the product from the trolley and the bill will be computed again. When the customer is completed with the shopping, they can head to the cash counter and provide their unique ID to the cashier person, by using the details he gets the purchased cart details from the server and carries out the payment as per the customers wish like cash, credit/debit card or UPI mode then the cashier generates the hard copy of the bill to the customer and the customer can leave mart with no time easily.

PRACTICAL IMAGES

A. Transmit Part

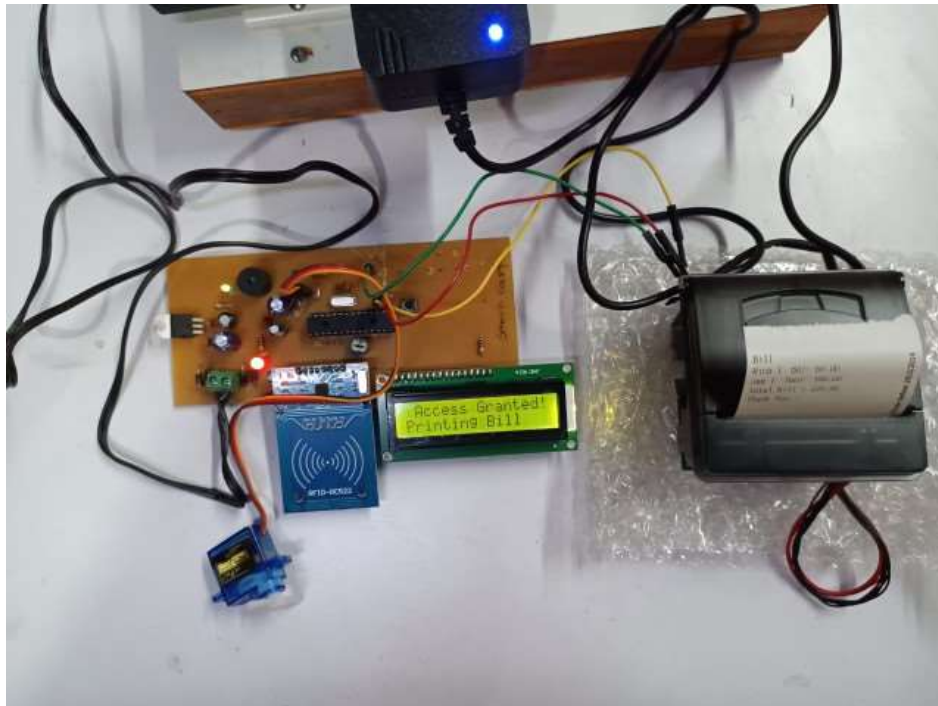


fig. 6.1 transmitter

B. Receiving Part



fig. 6.2 receiver

I. CONCLUSION

The headway in science and innovation is a tireless procedure. The most recent contraptions and the most recent innovation are being planned and created. This application is utilized in shopping centers for helping clients by sparing a great deal of time in purchasing items. In this undertaking, RFID is utilized as sheltered access for the thing which accordingly upgrades the observation execution. This usage starts with a central billing station framework in shopping centers and general stores. With this, customers never again need to sit tight close counters for the installment of bills in view of their acquired thing data getting moved to the billing counters. By this billing procedure speed increments and turns out to be a lot less difficult. Notwithstanding this ability, the instrument additionally guarantees acknowledgment of instances of burglary incited by deceitful shoppers which makes the framework progressively solid and interesting to the two clients just as dealers. This will upgrade the shopping knowledge to another dimension. Various factors like thing cost, thing name, and so on are constantly shown on LCD joined to the trolley. In this way, we can say that the programmed billing of items by utilizing RFID strategies will be a progressively achievable decision in the up and coming days and along these lines, the task turns out to be increasingly succinct and precise.

The goal is successfully accomplished in the model created. The created product is of minimal effort, genial to utilize and does not require a particular practice. The capacity to make a choice should be possible in the cart itself which can be utilized in the shopping buildings for an easy and smart method for obtaining things to spare essentialness, time and cash of the clients. The venture is assessed with various preliminary cases with particular things evaluated for all the pragmatic preliminaries. Labels utilized in this task are of water delicate so the trolley is limited to utilize water-touchy items. Furthermore, besides, labels utilized in this undertaking have the limit of identifying just one side, hence, labels are appended to items in a round manner so as to dodge non detection.

III.FUTURE SCOPE

The smart shopping trolley has a high beneficiary future aspect. The project can be modified for better performance in several categories. The trolley can communicate with the cloud platform and mention the activity it is performing, like moving to the stack, or stooped due to the presence of an obstacle. This will enable the administrative staff knows about the function of the trolley. The trolley can be modified so that it can detect obstacles and behave with the presence of obstacles without disturbing them.

The smart shopping trolley can be equipped with RFID sensors so that the trolley can be tracked more efficiently by the administrative staff. RFID sensors and tags can be used to detect the product chosen by the customer. This will help to analyze the shopping activities of customers and gather data about people thoughts on various products. RFID sensors will also enable the trolley to calculate the bill itself. This will save customers time from standing in the queue while checking out.

Furthermore, the trolley can be controlled from the dashboard by the administrative staff by using two-way communication of the cloud platform. In this project only one-way communication, which means the dashboard could receive information from the sensors through ESP8266.

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