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Smart Shopping Trolley With Automated Billing

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ABSTRACT:

Technology has changed so much, so is the rate of people of all ages who are attracted to electronic gadgets. In many industries, electronic devices such as smart card readers, barcodes, and RFID scanners are increasingly used. Supermarkets also need these kinds of gadgets. Currently, every person in the mall purchases the product placed in the trolley. Upon purchase, the person will have to stand in a queue for billing. In the billing process, an employee scans each product's barcode and bills it to the final. This process can take a lot of time and it can be even worse on holidays, special offers or weekends. To overcome this, a smart way to shop in malls has been developed. Each product has an RFID tag instead of a barcode. The Smart Trolley features an RFID reader, LCD module. When a person places any product on the trolley, it is scanned and the product's cost, name, and expiration date are displayed. The total cost will be added to the final check out bill. Once the purchase is complete, the purchase details are sent to the customer through the GSM module.

INTRODUCTION:

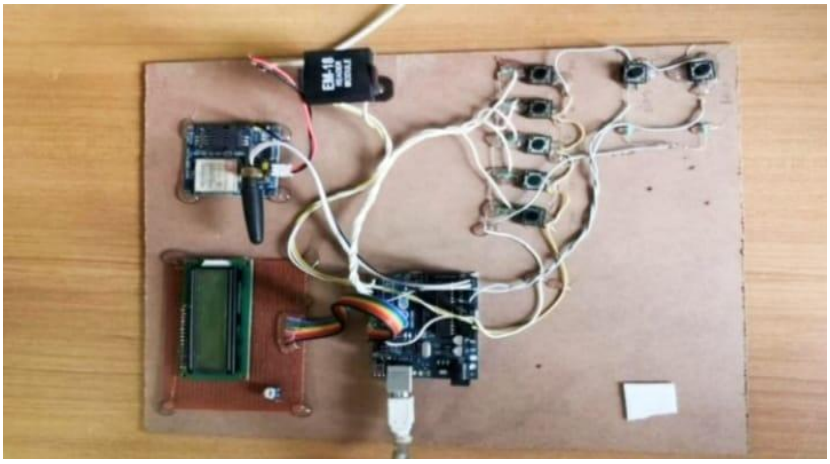

Fig. 1

This innovative project includes an automated billing system that can be placed in a shopping trolley. This automated payment system includes an RFID reader controlled by Arduino instead of the traditional barcode readers. A unique membership card is provided to every customer where all the personal details & the account balance details of the customer are stored. The shoppers can deposit cash in counters before shopping, balance & other details will be updated whenever the shopper deposits cash at the billing counter. So, whenever the

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shopper goes shopping, he/she has to scan the special membership card against the RFID reader attached to the cart. Therefore, all the required personal details will be transferred to the microcontrollers, memory. Then a welcome text with account balance details is displayed on the LCD screen. Now the system will be ready to start scanning. The products. Any product, he/she has to scan it against the RFID reader & then has to get it into the cart. All the product details are displayed on the LCD along with the price of the product. As the shopper goes on adding products, every product is detected by the module & therefore the price will increase accordingly. In case if the shopper changes his/her mind & doesn't want any product added into the trolley, he/she can remove it by scanning the same product once again against the reader & the price added will be deducted automatically.

LITERATURE REVIEW:

People have consistently imagined and built up an innovation to help their needs as far back as the start of humanity. The fundamental reason for headway in innovation has been in limiting errands and making regular tasks simpler and quicker, regardless of the different spaces accessible. A significant task on which people are discovered spending significant measure of time is shopping. For this at start we used barcode system but after some years it also started to have issues like LOS (line of sight), increasing queue etc. so overcome this issues a concept of smart trolley with RFID technology was proposed. The implementation of IOT (Internet of Things) based automated trolley system was reported in. Framework is utilized to ease lines in shopping center by utilizing RFID module. The RFID reader will peruse the RFID Tag set on the item when the item fall in the trolley. In the event that, the client needs to expel any item then he should expel that item from the trolley.

COMPONENTS USED:

Here is the list of components which we have used to complete this project.

1. RFID Module & Cards
2. Arduino
3. LCD Display
4. Push Buttons
5. Switch

BLOCK DIAGRAM:

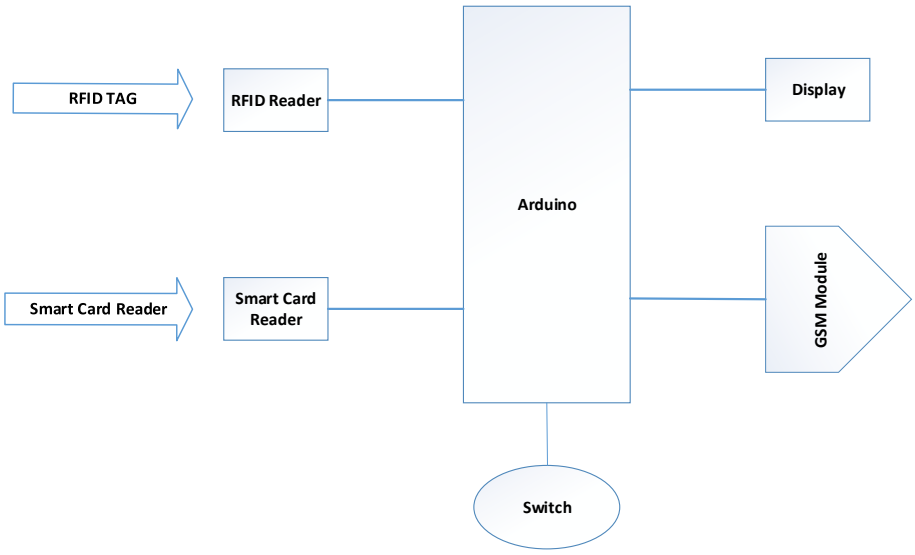

Fig.2

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SYSTEM FLOW DIAGRAM:

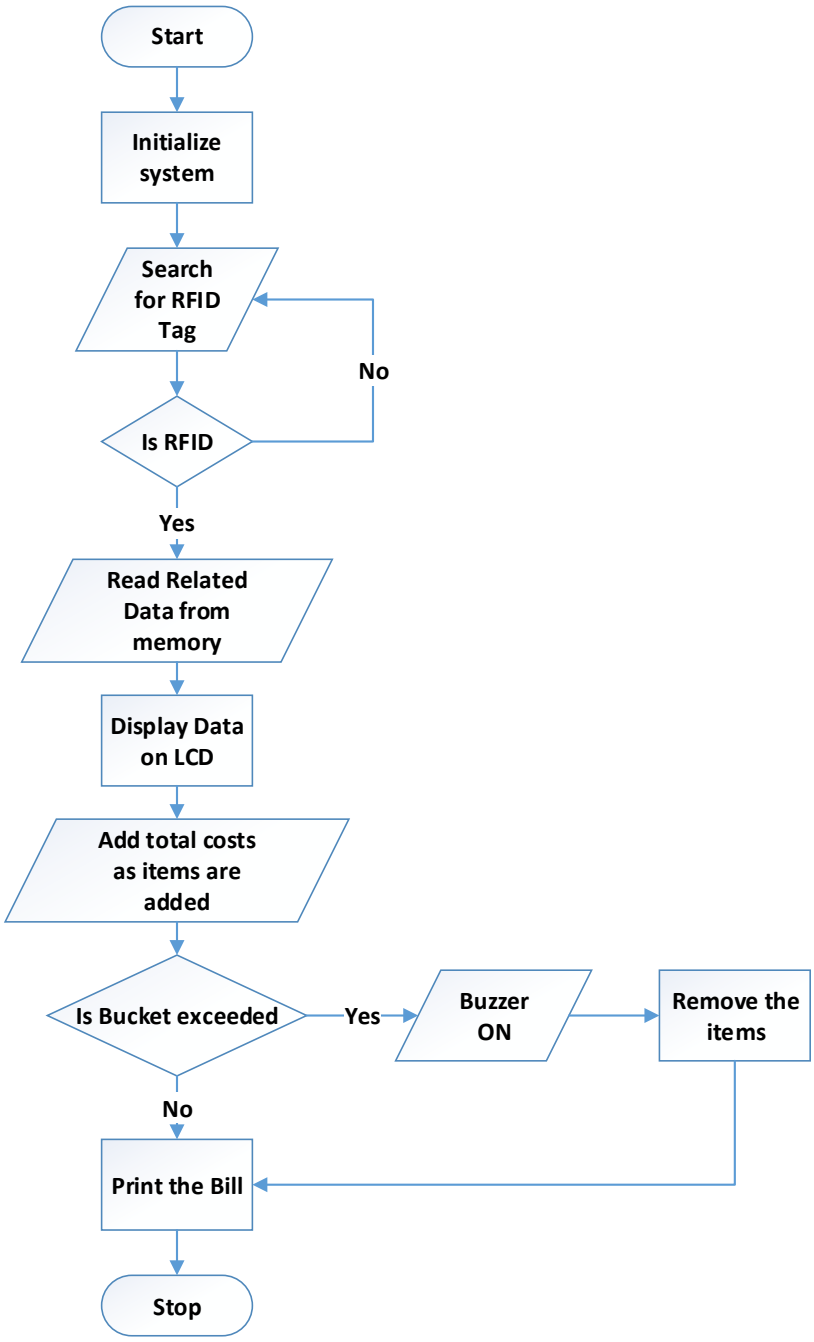

Fig. 3

The block diagram consists of 7 components in total where 5 of them will be embedded-attachedto the shopping cart. Arduino UNO ATmega328 microcontroller is interfaced with various modules i.e. RFID reader-RC522 SPI, LCD panel20x4, 9V battery, RFID card, GSM module-GSM SIM 900 and a mobile phone is required for receiving SMS.

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WORKING/ RESULTS:

As shown in the above block diagram, the Arduino is interfaced with all theremaining components. Once the microcontroller is powered up with the use of a 9v battery it isinitialized and set to the basic settings, now the system is ready to proceed which means the RFIDcard and the tag can be scanned.

Fig.4

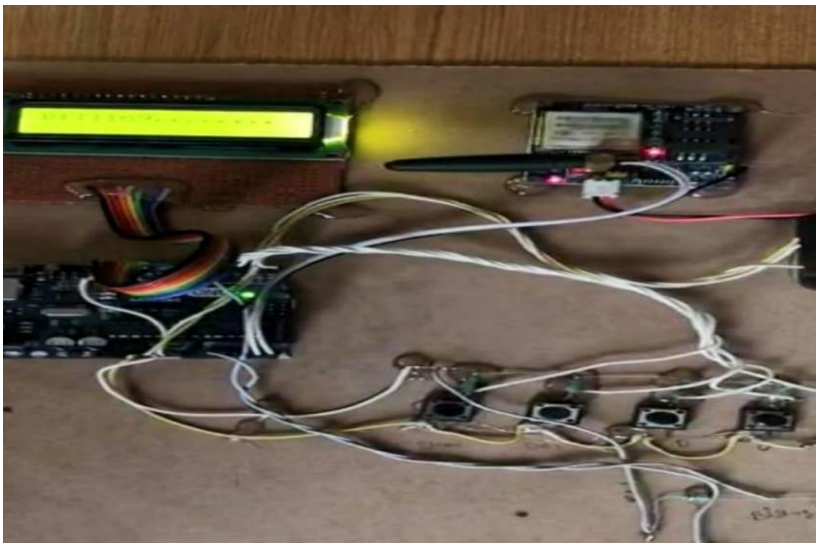

Fig. 5

Then the RFID card or tag is scanned the RFID reader fetches all the details from the scanned card or tag, and if the scanning process is successful the product details will be transferred to the microcontroller's memory and then will be transferred to the LCD module to be displayed on the LCD screen. Here the RFID module uses the SPI communication technique to transfer or to retrieve the data from the RFID card or tag. After the shopping is completed the entire bill details will be displayed on the LCD screen, each card or tag acts as a product, where the product details are pre early set or dumped into the card. When the bill amount is paid, the shopping details will be sent via the sim900 GSM module to the prescribed customer's mobile number. The entire working process is implemented by the software called Arduino IDE. The Proteus simulation software is used to check the simulation results before the hardware implementations. The framework work is the point at which the

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customer buys a thing, the customer must be examining the thing first with help of standardized tag are available in each item utilizing the RFID per user. At that point that acquired thing can be set into the trolley. While the client is examining the RF tag of the item, a cost of the buying item is taken and spared in the framework's memory/Arduino. Information put away in framework's memory is contrasted and the query table.

In the event that matches are discovered at that point cost, name of individual item gets showed on the LCD.

Step 1: Start

Step 2: When the system is powered up, display the initial data.

Step 3: Now the product scanning process is ready. If the scanned product code is detected, display all the product details on the LCD screen. If not, the product has to be scanned until it gets detected. This process applies to each & every product.

Step 4: If a scanned product is scanned once again then that product is removed from the micro-controllers memory & in the ongoing bill.

Step 5: Immediately after the bill amount is deducted from the card, an SMS is sent to the prescribed shopper'smobile phone via a GSM module regarding the shopping details.

CONCLUSION:

Whenever a product is added into the cart, it reads the product and stores the data. After completion of adding items the customer chooses their payment option and therefore the bill status is updated at the server of that particular cart. Customers can pay their bill through credit/debit cards near the cart or through cash at the billing section as automatically bill is generated. Hence, by using RFID based smart shopping cart and billing system the shopping can be made easy for the customers as well low cost and does not need any special training.

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