IoT based Smart-Cart with Item Count

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Abstract —*Various items are purchased in a shopping mall with the help of shopping cart. This product billing is an entirely time consuming process. In customer convenience they have to pull the trolley for each time to collect items and know the price of each product. After purchasing customer want to pay the bill for the purchase. At that time, they have to wait in a long queue to get their purchased products scanned and billed using RFID tags & Barcode Scanner. To simplify this process the cart of the customer have to smart enough to scan the items in the cart. Each and every product have a RFID barcode to scan the product with RFID reader. The Smart- Cart consists of a RFID reader, LCD display to scan and display the scanned and billed items. In order to obtain the count of products placed in the cart the Smart-Cart uses an IR module.*

***Keywords-* RFID tag, LCD Display, Barcode Reader, Arduino, IR sensor module**.

1. INTRODUCTION

Individuals have constantly created innovation to bolster their requirements as from the start of humankind. The fundamental reason for development in innovation is ought for more independency and this leads to improving tasks and making regular one speedier and simpler. One significant task that individuals invest maximum measure of their energy is in Shopping. A lot of customers complete their shopping quickly but has to wait in the long queuesto get their items and a lot of people tend to get out of the queue because of this issue. This proposed Smart-Cart resolves this issues. By employing this project the user has to scan the item before placing the product in the cart. This Smart-Cart has a LCD display which displays the total of billed items and also the items that were placed in the cart. So by using this Smart-Cart the billing process will be complete comfortably and quickly.

2. Purpose of the Project:

The fundamental motivation behind this system is to show the proposition of a design and arrangement of an innovative framework for obtaining the items in market. This cart explores rising versatile innovations and programmed recognizable proof advancements, for example RFID, as an approach to enhance the nature of administrations given by retailers and to expand the customer esteem consequently permitting to save time and cash. This smart has the capability to make shopping more relaxable, comfortable, secure billing and fastens the billing process.

3.Objective:

The main objective involved in this project is to implement a smart shopping cart with the help ofRFID technology for improvised purchase. The plan is to employ the RFID related surveillance implementation practice in the purchasing cart. The user has to scan the barcode of the product before placing it into the cart so that the total number of billed items will be updated. If the customer does not scan the item but still places it in the cart then the total number of products in the cart will be updated but this time billed item's count will not be updated. When there is this mismatch the officials or the employees in the mart

will check and bill the products. In this way this project provides a safe and secure billing method.

4. Proposed System:

The proposed system in this thesis will be implemented in two parts. First part of for the initialization of Arduino for the setup of RFID. Second part is the tag detection of products by RFID Reader which are placed in the cart. The proposed system works as on customer getting into the mall she/he takes a trolley. When the customer starts picking the products and places them in the cart their RFID tags will be detected and their prices will be added to the Billed items and Total items and if the user drops the products into the cart then only the Total items in the cart will be updated leaving the billed items section as it is.

At the transmitter section the reader detect the tags and sends data to Arduino which then compares it with the data stored and then displays on the LCD display.

Block Diagram:
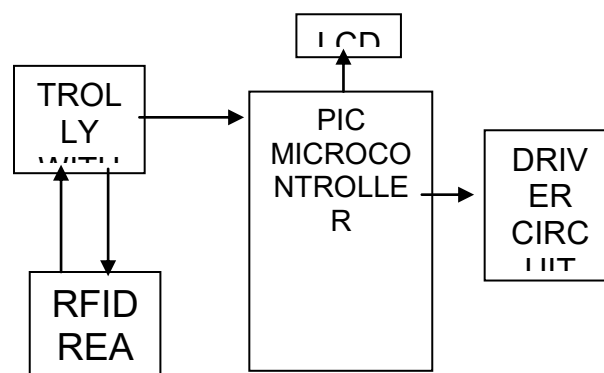
Here the MicroController is used to store information regarding each RFID tag and use them accordingly. In this project we used Arduino microcontroller.

5. Components

5.1 RFID:

RFID is the acronym for "Radio-Frequency Identification" and refer to a technology where digital data is encoded in RFID tags or Smart labels and that data is read via radio waves. The general use of these is in the form of barcodes printed on the products.


5.2 RFID tags:

RFID tags are a type of cards which are encoded with data which will be read by a reader by transmitting radio waves on them. If we want to read that data then we have to send this data to a micro controller in order to process and read the data.

5.3 LCD Display:

Here LCD display is used to display the data that is read from the RFID module. The LCD displays two

items they are Scanned or Billed items and the Total number of items in the cart.
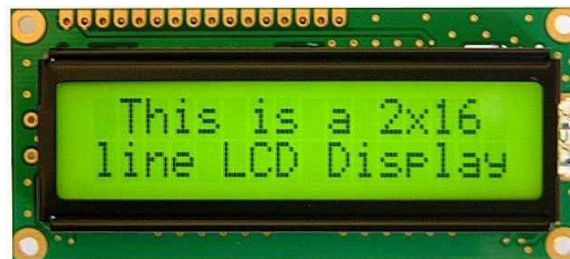
5.4 Micro-Controller:

Here the micro-controller that is used is Arduino Board which is programmed to collect information from the RFID module and display it in the LCD it will also get information from the IR sensor module which is used to get the count of total number of products that are placed in the cart even if some of them are not scanned at the RFID module.
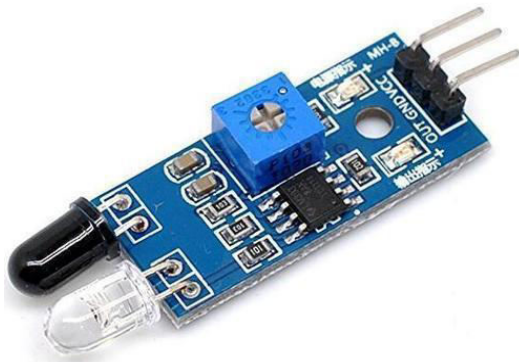

5.5 IR sensor Module:

The IR sensor module consists of an IR transmitter and IR receiver which continuously transmits the IR rays. Here IR sensor module is used in such a way that is used to provide the count of items

that are being placed used in such a way that it is used to provide the count of items that are being placed in the cart. Whenever an item gets past the IR module the rays gets interrupted and the object will be detected.

These are the major components of this project but besides these there are some other components that will be used for power constraints because we need to use some power supply like batteries in the cart and this has to be converted to DC in order to make sure that all components work fail proof.

6.Conclusion:

The Smart-Cart helps in reducing the billing time by notifying the billed items and total items on the display attached to the trolley. This is done by using RFID module and IR sensor module. The sum of the cost of billed items is shown on the LCD and at the billing counter the person will just have to check whether the total items and scanned items are equal if so then the customer will pay the bill at the checkout counter.

References

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