Automated Shopping Cart For Super Market

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Abstract- *Arduino based design, has acquired the status of most happening field in electronics. Nowadays, in super markets for purchasing variety of items it requires trolley. All the time customer has to pull the trolley from rack to rack for collecting items and after this procedure, customer has to wait in a queue for billing.*

So to avoid headache like pulling trolley, waiting in billing queue, We are introducing a new concept that is "AUTOMATED SHOPPING CART FOR SUPER MARKET". We havedeveloped a arduino based trolley which is totally automatic and it travels between two racks and any of the customer's can drop there products into the trolley after just sticking the given barcodes to them onto the products, the trolley will then stop near the counter and the labour at the counter will scan the barcode and sort each customer's products based on there barcodes.

Keywords- waiting in queue, efforts of pulling a trolley, Automated Shopping Cart, ardino based trolley, barcode scanning, avoid crowd, saves time.

I. INTRODUCTION

1.1 Back ground of the project:

This Project deals with the implementation of Automated Shopping Cart. This "Smart Cart" is an ingenious consumer purchasing product that is designed such that it travels automatically between two racks and carries the products dropped by the customers in it, upto the counter.

 Automated Shopping Cart aims to reduce, and possibly eliminate the total waiting time of customers, lower the total manpower requirement and expenses for markets and increase efficiency overall. The main aim is to satisfy the customer and also reduce their efforts. The trolley travels between two racks and any of the customer's can drop there products into the trolley after just sticking the given barcodes to them onto the products, the trolley will then stop near the counter and the labor at the counter will scan the barcode and sort each customer's products based on the barcodes. The role of the customer will be just drop the product and after the shopping of items is done completely he/she have to collect the products at the counter and pay the bill.The idea of implementing this product is to reduce customer's efforts, time and also avoid the crowd in super market.

1.2 Problem Statement:

People buy many products in supermarkets despite the presence of E-commerce for the sake of their own satisfaction. In the modern world, every supermarket make use of shopping trolleys in order to help customers to select and store the products which they expect to purchase. The customer have to drop every product which they wish to purchase into the shopping cart and then proceed to checkout at the billing counter. Among the difficulties faced by the customers one difficulty is to wait in a queue through the billing process, though their intention is just to buy one or two products. Billing process is quite boring and highly time taking and has made the need for shops to employ more and more humans in the billing section, and yet waiting time remains considerably high.

1.3 Project Objective:

The main objective of this project is to reduce and eliminate time taken in billing counter in supermarkets, efforts of pulling a trolley from place to place, avoiding crowd in super markets by designing an **Automated Shopping Cart** which travels automatically between two racks and carries the products dropped by the customers in it, up to the counter.

1.4 Significance of Project:

- Customer don't need to take efforts of pulling a trolley from place to place.
- It also helps in avoiding crowd as there is no need for each customer to carry a trolley.
- There is no need for a customer to wait in a queue for billing process.
- Saves time as well.

II. PROJECT IDEA

2.1 Current Super markets:

2.1.1 Rush in Super markets:

Figure2.1.1 Rush in Super markets

2.1.2 Long Queue:

Figure2.1.2 Long Queue

2.1.3 Collision of Trollies

Figure2.1.3 Collision of Trollies

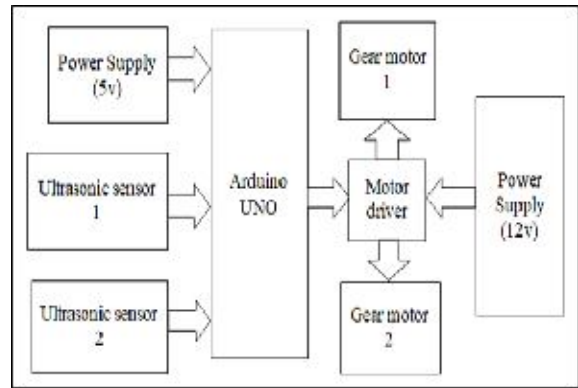**2.2   Block Diagram:**

Figure2.1:Functional Block Diagram

Block Diagram Description:

- **ArduinoUNO**: Arduino UNO is the microcontroller board based on the AT mega 32SP which can takes measurements from sensors and provide signal as per the real time conditions to the motor driver .

- **Power Supply (5V):** It is used for operation of ultrasonic sensors, enable pin of motor driver and its operating input voltage and also input voltage for "Arduino UNO".

- **Power Supply (12V):** It is used for operating motors and also used as VS supply for motor driver IC.

  - **Ultrasonic sensors:** This sensors are used to sense the object and if the distance from that object is less than or equal to 20 cm the trolley will travel in the backward direction

  - **Motor Driver :** Driver IC (L293D) it is a typical driver or motor driver IC which allow DC motor to drive on either direction.

  - **Gear motor :** It has a gear assembly attached to the motor. This is a concept, where gear reduces the speed of motor and also increases its torque accordingly. Torque increase its weight handling capacity.

2.3 Methodology

- Designed circuit on proteus.
- Built code for the simulation in Aurdino IDE-Tool.
- Designed voltage regulator and motor driver IC Circuit.
- Build the prototype for the trolley.

- Design unique barcode for each and every customers for identification and safety purpose.
- Barcode scanner for scanning the barcode sticker on the product and sorting them as per the unique barcode on it and store them in their basket.
- Design a software for billing purpose.
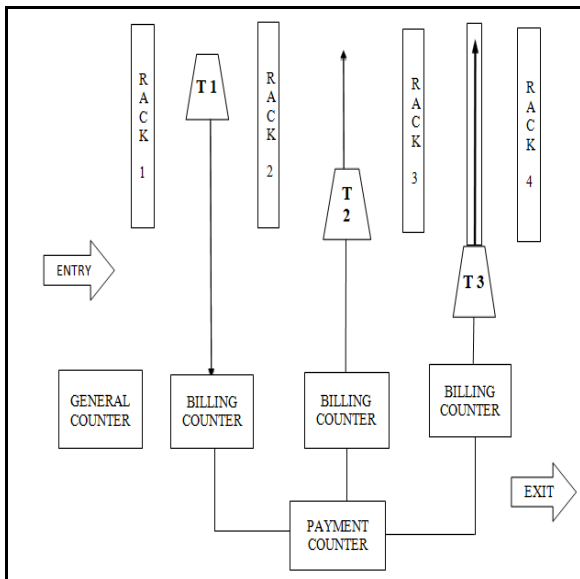
III. PROJECT WORKING

3.1 Working:

Figure3.1 System Flow Diagram

The Automatic smart trolley consists of two modules namely automatic travelling and barcode scanning.

Customer will enter the super market and go to the general counter where he will be provided a barcode sheet and one barcode sticker will be sticked on the basket and that basket will be given to the Billing counter.

Customers will go for shopping and select the products they want and stick the barcode provided to them and drop them into the trolley.

The trolley will automatically travel to and fro between two racks, carry the products to the counter and wait for some time near a counter. The labor at the counter will scan the barcode this barcode scanning will done using barcode scanner, and sort the products as per the barcode and calculate the bill of the particular customer and store them into their basket.

When the customer is done with the shopping he/she will go to the payment counter and show his barcode. The labor at payment counter will customer's basket from billing counter. The customer will pay the bill and collect the products and exit Super Market.

3.2 Trolley Flow Diagram:
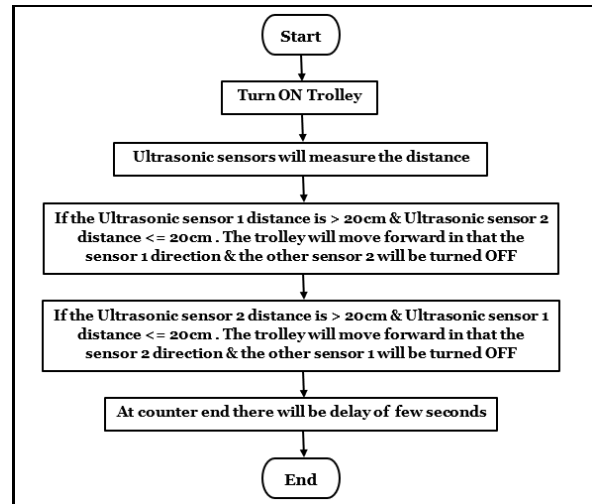
3.3 Simulation:

The simulation tool used for the analysis of the system in Proteus .It is an interactive circuit simulation tool in the design environment. It is possible to draw a complete circuit for a micro-controller based system and then test it interactively, all from within the same piece of software.

Both the ultrasonic sensors are connected to the microcontroller directly and the two DC motors are connected to the microcontroller through the L293D motor driver. As we give supply to the circuit the proteus measures the distance on the ultrasonic sensors and according to the measurements the motors rotate in the forward direction or the reverse direction. We can change the distance on the ultrasonic sensors and check whether the motors are rotating the way we have programmed them to rotate.

We store the program in the microcontroller with HEX file format. As we get automated ultrasonic sensors and automated DC motors, it helps in the simulation to understand the project better and correct the errors as per the need.
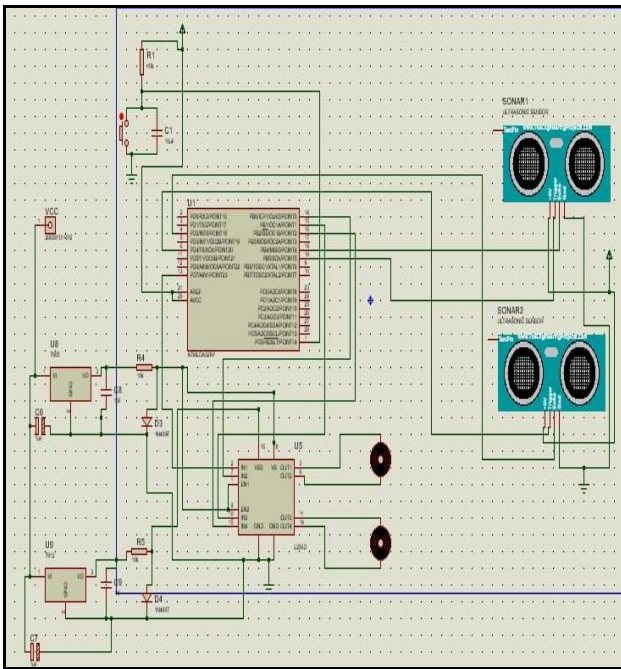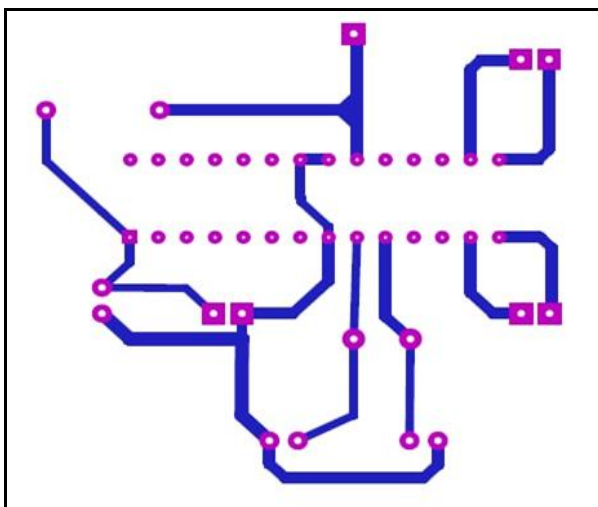
Figure 3.2 Circuit Diagram

3.4 PCB Layout:

Figure 3.3   PCB Layout

IV. FUTURE SCOPE

- Bill scanning process can be done on trolley so that user can be aware of the total bill amount during the time of purchase.
- We can transfer the bill to mobile instead of printing it.
- Stock inventory management can also be done.
- At shopping process all details of products purchased can be directly stored in a cloud by which direct billing can be done.

- Enchancement can be done to increase wide range in supermarkets.
- Voice assistance can be included.
- Net banking can be included.
- Robotic ARM can be used for picking and dropping of product.

IV.CONCLUSION

It is Smart shopping system which is developed with the help of aurdino and automatically travels between two racks of the super market, carry the items and stop near the counter. The system is made to reduce efforts, avoid crowd, save time and is highly reliable because of its effectiveness.

VII. ACKNOWLEDGMENT

REFERENCES

[1] https://www.omicsonline.org/open-access/smart-trolley.
[2] Automated Smart Trolley Using ARDUINO-IJRASET.
[3] https://www.researchgate.net/publication/318946385_RFID_based_Advanced_Shopping_Trolley_for_Super_Market
[4] https://www.researchgate.net/publication/269696290_ARDUINO_BASED_SMART_CART
[5] www.wikipedia.com
[6] www.youtube.com
[7] https://www.proto-pic.co.uk/arduino-uno-r3.html
[8] G S Rajagopal, Mr. S Gout, "Small Intelligent System for Shopping and Billing", International joutnal of Advance Reasearch Trends in Engineering and Technology, Volume 3,Special issue 19, April 2016.
[9] Mayur Subhash Chaudhari (2015) "A Review on Electronic Shopping Cart"
[10] KomalAmbekar, Vinayak Dhole, Supriya Sharma, ThusharWadekar, "Electronic Shopping Cart", International Journal of Innovative Research on Electronics, Volume 3, issue in January 2015.