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Internet of Things Based Smart Shopping Cart

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Abstract - *In spite of the presence of E-commerce, people prefer to buy product from supermarkets and malls for the sake of their own satisfaction. One of the difficulties faced by the consumers is, they have to stand in a long queues in the entire process of scanning of each product and also while performing the billing procedure. Their intent to buy only one or two products results in, time consuming process. Moreover, it is inconvenient as people live in a busy life. Money and average time spent on each consumer is more, especially in over-crowded malls or supermarket. In the existing scenario, Barcode technology is used, which comes with a lots of limitation. By implementing this smart machine, it will minimizes human efforts and also automate the billing procedure. So, in our prototype we are using RFID technology for identification of the purchased product and it reduces the scanning time of the consumer. The main objective behind making this project is to improvise the shopping experience. This system will be more efficient as compared to all the other system used for inventory management.*

Key Words: **Arduino Controller, RFID Reader and Tag, LCD Module, Node MCU.**

1. INTRODUCTION

Talking about the present scenario, the craze of shopping among the people increasing day by day. The consumer prefer shopping either online bases or mall bases .Currently, barcode system is in use, because shopkeeper has human power to handle the consumer by performing scanning and billing and also they are having employee's for security purpose. But the drawback of this is time management and also money spent on the individual employees. RFID technologies are widely spread and taking an important role in many projects due to its effective and fast response. RFID tag is basically used for the purpose of unique identification of the purchased product by using radio waves. These RFID offer more benefits over existing barcodes, which are still in use as they have major drawbacks like a direct line of sight operation and its scanning range is just from few inches to few feet. Barcode reader can read one product at a time. Barcode system runs on optical technology. Barcode requires considerable amount of human efforts. Not only this, barcode tags have constraints in its durability. Moreover, the RFID tags are more durable and also they are able to read/write data which could even be encrypted. In addition, plenty of data like product detail, price, size, and other information can hold by these tags by assigning a unique identification number. With the help of RFID technology it makes it easier and simplifies the process of identification of product. The controller controls the shopping cart with an RFID Reader to scan each purchased product. Every new consumer will provide a unique RFID based membership card, which will hold information about the person. After finish purchasing, he or she could pay his or her final bill by deducting money from the membership card or even through the app. This concept satisfies the expectation of consumers whose basic demand is to ease the way of purchase. By regulating the RFID technology-based shopping cart one can bill the purchased product themselves without bothering the presence of workers in shopping malls or supermarket as the product information are available and display in the cart. This outcome of the project will facilitate the consumers but also the shopkeeper by eliminating the cashier and money spent on them.

2. METHODOLOGY

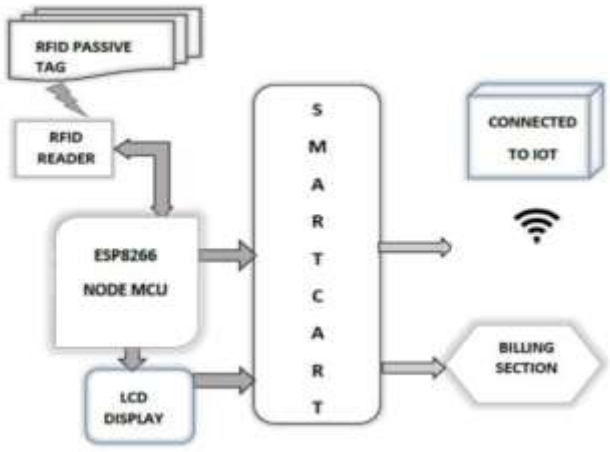

Fig -1: Block diagram representation of the concept

This is the block diagram representation of our project which is named as "IOT BASED SMART SHOPPING CART "SYSTEM. It consists of cart that is incorporated with RFID

reader. As soon as the customer placed the product they want to buy into the cart, the RFID readers attach to the cart will search for RFID tag. As the reader detects the RFID tag present on the product. All the information of the product associated like name of the product, manufacturing, date, and price received from the tag shall be stored in the NODEMCU module. Here we are using NODEMCU module, as it has in-built WIFI mode, which play a role of information exchange between the cart and server where we are storing the complete inventory list of the product present in shop. Then afterwards, the purchased product list is compared with the server data. If the customer wishes to remove any of the product, he or she just has to simply place the product again in front of the reader in the cart itself. After finish purchasing of product, total amount of bill is generated and display on 16*2 LCD of the cart and also at the billing section. When the customer goes to the billing section he has to only pay the amount. As the bill gets paid by the customer, he or she can exist the shopping store.

3. FLOWCHART

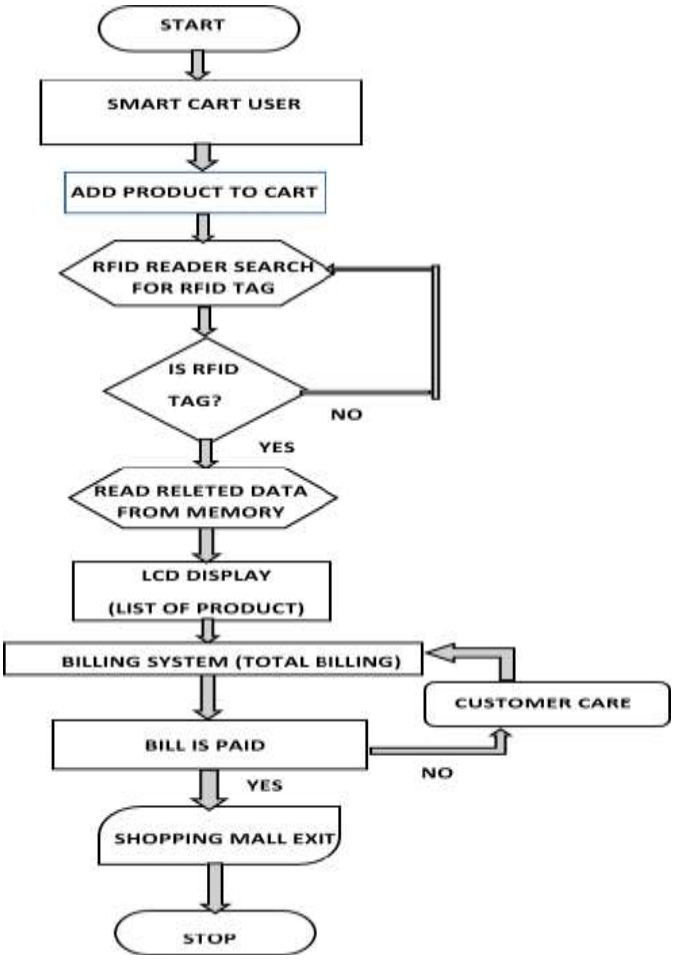

Fig -2: Flowchart Representation

This flowchart will illustrate the working of this entire system:-

Step 1: Start
Step 2: Place the product with an RFID Tag in front of RFID reader which holds the information of the respective product.
Step 3: ESP8266 module Store the information of the respective product.
Step 4: Now the total amount is compared and calculated in the server itself.
Step 6: The total amount is then displayed on to the LCD.
Step 7: Now the customer proceed to billing section for paying the bill.
Step 8: Now the shopkeeper is having entire history of the purchased product.
Step 9: After shopkeeper cross checks everything, customer can exist the store.

4. RESULTS Below are the 3 different picture of the functionalities perform in the cart.

i. When System is initialized.

ii. When the commodity is added into the cart.

iii. When the commodity is removed from the cart.

Above Image is of shopkeeper terminal which is entirely controlled by shopkeeper only. We have design an app where the shopkeeper just have to enter "Get" on the type here section. Then afterwards shopkeeper will get the entire purchased commodity list of the customer. Then after typing "OK" the terminal of the app get clear.

5. CONCLUSIONS

Thus with the help of the conclusion we can say that, the main objective involved is to implement a smart cart system with the help of RFID technology for improvising-purchasing and product tracking. The plan is to employ the RFID related surveillance in the purchasing cart. In this system RFID card is utilized as entry for acquiring of commodities in the supermarket and malls. As the commodity put into the cart the price of the product appear and in a similar way the total amount will show. As a result of this it will boosts security performance and speed up the process of billing and purchasing of the product using RFID's technology for the reorganization of commodities in the interior of the cart. The principle point of framework is to give an innovation which is effectively adaptable, minimal effort oriented ,and efficiently feasible for helping shopping of individual with the help of the more time will saved at the billing counter.

6. REFERENCES

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