Research Article

QR Code Based Smart Trolley Using Mobile

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Abstract

This paper provides a centralized IoT-based smart automated billing system using RFID. Radiofrequency identification technology is used for supply chains, streamlining inventory, and shoppers swarms. Developed a Mobile app using Java and Python programming languages. The main aim of a mobile app to search the location of the product in the shopping mall using a shopping assistant which is available in the Mobile app. ESP8266 is a WIFI device used to transmit billing information to the cloud. And this device acts as an intermediary device for this project. Each and every product in the shopping malls will be provided with an RFID tag, to know the product information. After scanning the RFID tag the product information will be stored in EEPROM and the billing data will be sent to the cloud using the Wi-Fi device module. And then, it will access the database and it will calculate the total purchase amount of the particular trolley The main aim of this paper was to provide a QR code and IOT based automatic billing to avoid searching for the products and to avoid the queue in shopping malls and supermarkets.

Keywords: Arduino mega, RFID tags, Java, Python, Arduino IDE, ESP8266 WIFI module.

Introduction

In our day-to-day life, we are seeing that every Shopping malls and Supermarkets are facing problems at the searching for the products and long queues at the billing counters. We can see that if a person entering the shopping mall and don't know that where the product is located and if he is continuously searching for the product takes much time and being irritated.

Another major problem is waiting for the long time in queues at the billing counter.

Now a days, we are seeing that RFID technology is growing rapidly in many industries to make great inventions. Though RFID is a old technology the advancements of chip manufacturing is increasing for the new applications. RFID systems consists of small tags, transponders which are physically attached to the objects. And RFID transceivers respond with some identifying information that which are stored in the data records. Thus, RFID systems are similar to bar codes and those are the type of automatic identification systems.

This project mainly uses the QR code for connecting to the Market database and the Java Programming for the Mobile Assistant and we will be using the RFID tags for the products to get the product data. And a wifi module is used to transmit the billing data to the cloud.

Shopping malls and Supermarkets is only the place where customers purchase their daily needs. Nowadays every shopping mall and supermarket chain is thinking to reduce labor costs by shifting to self-service check-out machines.

Exixsting System

In this system, only the scanner is attached to the trolley to scan the products. This system runs using only Microcontrollers. And there is an LCD display which shows the total price of items in the trolley.

It uses the Microcontroller and Zigbee device, which is used to transfer the data to the database. And the customer only should search for the products by manually. And ZigBee takes long time to transfer data and the bill payment will also be paid in the billing counter.

Proposed System

In the proposed system we are going to implement QR code, Shopping assistant, Thermal Printer and the whole process will be done using Iot and Cloud technologies.

While scanning the QR code with the mobile, the shopping mall database will be connected to our mobile. We have implemented a shopping assistant which is used to get the location of the particular product. RFID tags are used that which is attached to the product for scanning .

And the Wi-Fi ESP8266 module is connected which is used to transfer the billing data to the cloud. The cloud automatically stores data and in the database , it calculates the bill and sends the total amount of the bill. So we can make bill payments through online

Blockdiagram:
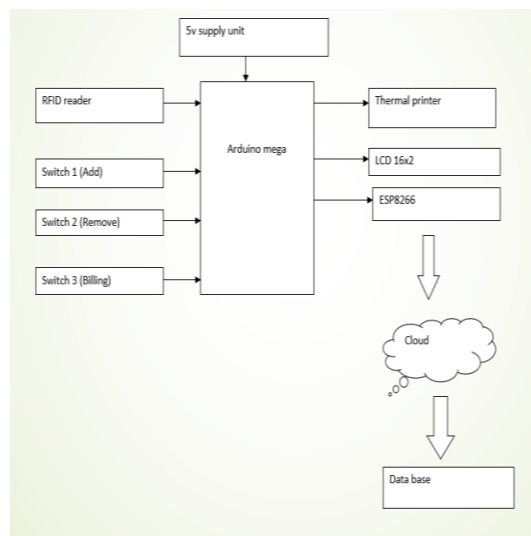
Hardware and Software Setup

A. HARDWARE SETUP

We have used the Arduino Mega in the hardware with ATMEGA2560 microcontroller. And to scan the products we have placed the RFID reader and for transferring the data we have connected the Node MCU wifi module to the Arduino. And an LCD display to display the products information and we have placed a Thermal Printer to get the billing slip.

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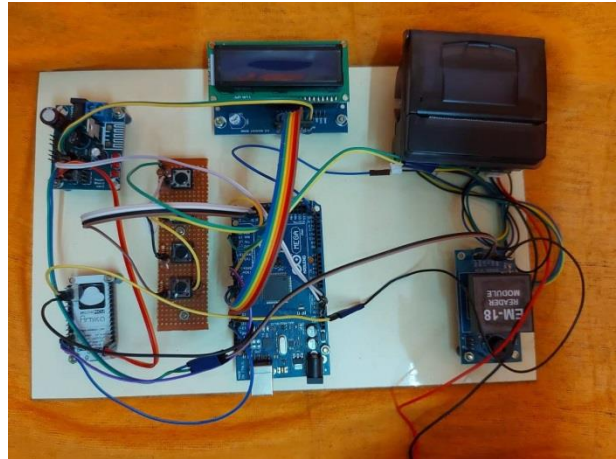
B. SOFTWARE SETUP

In this project we have used the Arduino IDE to operate the hardware part. And Mobile application has been developed to search for the products and for the bill payment. C language is used for developing the Mobile application. And Firebase is used to get the customer purchase details.
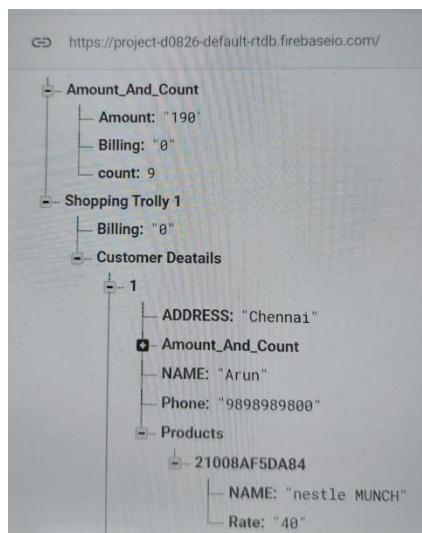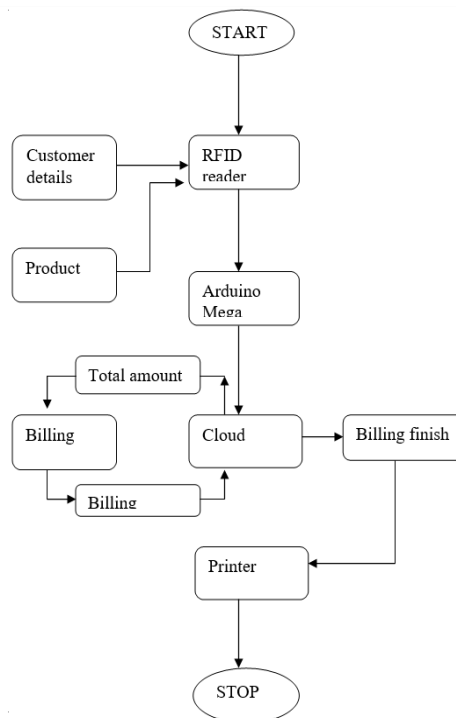

In the above figure we can see that in database the customer details, trolley details and billing details will be saved in the database.

Proposed Process
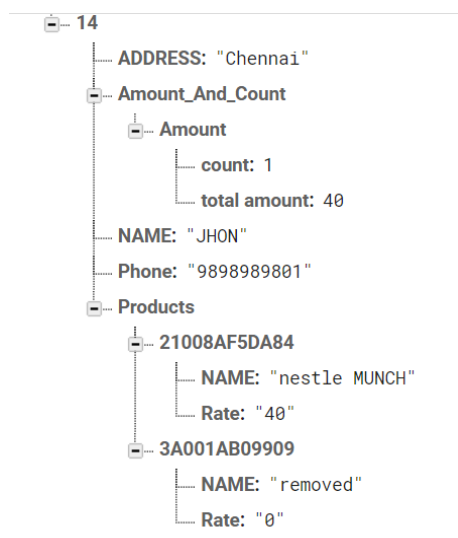

Flow Chart

Advantages of the Proposed System

The advantages of the proposed system are

- Data transmission is fast to the cloud.

- Long queues and billing counters are reduced.

- Searching for the products is very easy.

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Result

- 14
    - ADDRESS: "Chennai"
    - Amount_And_Count
        - Amount
            - count: 1
            - total amount: 40
    - NAME: "JHON"
    - Phone: "9898989801"
    - Products
        - 21008AF5DA84
            - NAME: "nestle MUNCH"
            - Rate: "40"
        - 3A001AB09909
            - NAME: "removed"
            - Rate: "0"

In the result the customer gets application through which he gets the products data and its location in the shopping mall through the malls database in mobile. Customers can save the time without standing in a long queue in the Supermarkets.

Conclusion

- Shopping Assistant is used to get the location of the product, and it is also used to find whether the product is available in the supermarket or not through mobile app developed using Java and Python.

- Total scanning equipment attached to the trolley which the customers are operated by manually.

- By using this system, we can avoid the lengthy queues, huge crowd in shopping malls, and billing counters.

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