

Implementation of Smart Basket in Retail Marts Using RFID Tags and Wi-Fi Module for Fast Bill Generation

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Abstract - In Traditional way of shopping where the customers choose their wished product and carry the products along with them. Then customer must wait in long queues at the cash counter. This consumes lot of time and energy of both the shopper as well as cashier. To overcome this law, RFID tag is attached to product and RFID reader connected to trolley, Customer place product tag near to reader while making purchase, system retrieve essential details of all products from shops database and generate bill.

Key Words: RFID, ESP8266 Node MCU, Smart Basket, Wi-Fi Module.

1. INTRODUCTION

Throughout the century many of the innovations and information technologies are drastically changing and so as our views and expectations. In the contemporary world shopping plays a key role in our daily life. The retail marts are the place where all the commodities, basic necessities of the consumer are readily available, and lot of people are willing to go to retail marts for shopping. So, with the increase of crowd in the retail marts generating a bill to the customer is taking longer time. A main thing where human spend maximum time is shopping. According to survey we can say human spend approximately 1 to 1.5 hours for shopping and most of the customers will always tend to walk out of a queue if it is long. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. The tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

When user done shopping, user can pay the bill with card or online. For card payment user can pay the bill with credit card or debit card.

2. LITERATURE SURVEY

Smart Trolley using RFID.

A. In this product the RFID technology was used with IR technology. The infra-red technology is another technology which was used in past years to get the Smart trolley work inside the mall. The system also contains ARM processor like in past microcontroller for processing of the desired data [1]. The concept of smart shopping cart there was a use of IR sensor and ARM processor which made alert for the customer whether a product has been removed. This was introduced due to theft and fraud or any disputes between customer and shop owner and smart shopping trolley but depending upon growing technology, need of the market and hardware cost each year the products must bring some changes [2].

B. This product used a RS232 protocol which helps in the processing for billing purpose along with ARM processor. The working was simple and like past products but with ease of use. The customer must scan the RFID tag i.e., a chip on RFID reader the details of the product will be sent to system memory. As the customer scans the product there will be an option to check whether the product is available or not on LCD display. If the product is found the basic details such as name and price on LCD display [8]. The product details are processed in a way where ARM processor and the protocol i.e., RS232 will work to calculate and process the data. The IR sensor mentioned before is used for counting purpose i.e., to count the number of products. The sensor will emit the rays in continuous fashion and help in storing the products in ARM processor. After completion of the shopping, there is a button which

when pressed indicates the final billing of the products on a web-based interface [4].

3. PRODUCT DESCRIPTION

The paper is to style a sensible handcart which helps users with their shopping. The microcontroller used to achieve the functions required is an ESP8266 Wi-Fi module. It has been divided into five broad areas to realize the targeted functionality:

3.1. NodeMCU

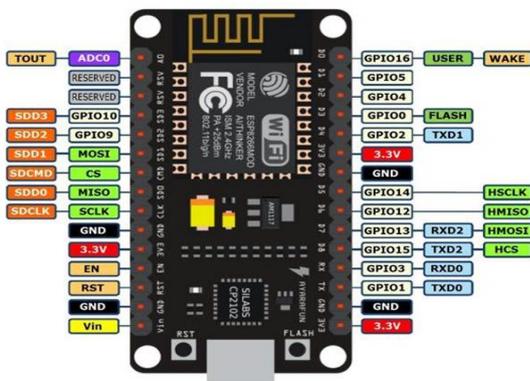


Fig -3.1: ESP8266 NodeMCU

Node MCU may be a low-cost open source IoT platform. It consists of firmware which runs on ESP8266 Wi-Fi Soc. The Node MCU has a controller which includes the main antenna and chip. It also contains digital pin (GPIO, GPI1...), with digital pin apart it also contains Analog pin (MOSI, CS, MISO, SCLK). Clock is the heart of the Node MCU. The Node MCU consists of 2 buttons, FLASH AND RST. FLASH is used in for IoT projects, and it makes IoT products work smoothly. RST: The reset button is used to bring pointer of controller to zero on memory.

3.2. RFID Tags



Fig -3.2: RFID Tags

RFID tags are used as tracking system which makes use of smart barcodes to spot items. RFIS stands for “radio frequency identification,” and as such, RFID tags utilize radio frequency technology. It is uniquely designed in HEX Code which makes it unique when it comes in terms of multiple layering in hardware embedded systems. It holds internal coil with in-built chip and integrated antenna and the unique HEX number in it. It is operated by transmitting and receiving information or data through antenna and a microchip.

3.3. RFID Reader



Fig -3.3: RFID Reader

RFID Reader is a transponding device which repels the sending of electromagnetic waves sent by the RFID tag when a product is scanned. It is the brain of the RFID system and is necessary for a system to function. They transmit and receive radio waves in order to communicate with RFID tags. Mobile readers are handheld devices that leave flexibility when reading RFID tags while still having the ability to speak with a number computer or smart device. There are two primary types of Mobile RFID readers; they are readers with an on-board computer which are called Mobile Computing Devices, and readers that make use of Bluetooth connection to a smart device which is called Sleds.

3.4. Arduino IDE



Fig -3.4: Arduino IDE

Arduino IDE is used for connecting the Arduino and Genuine hardware to upload programs and communicate with them. The basic working of Arduino is Arduino board is connected to a computer via USB where further it connects with Arduino IDE and the user writes the Arduino code in the IDE, and then uploads it to microcontroller which executes code, interacting with inputs and outputs such as sensors, cards, motors, RFID modules and lights. The same working is followed in smart basket. The Arduino board consists of microcontroller, and which relates to RFID reader, when product is scanned (the barcode) with RFID tag the working starts and the code execution begins.

4. CONCLUSIONS

In a step aimed at promoting shopping methods and make people life easier; we are going to build this system that could play an important role in Indian society as rate of population is going towards mall & shopping centre. As COVID has tampered the business cycle, so fast check out & easy shopping will also boost & due to fast movement COVID Spread shall stop.

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