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IOT BASED SMART RETAIL STORE

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Abstract: **In today's world, where everything is getting smarter and automatic , people are looking towards more innovation. Our project aims to produce an unmanned shopping system where people can walk in, pick the product and just walk out, with no queues and no checkouts. This system provides RFID identification at entrance and products are interfaced with sensors and the microcontroller which sends product data to the mobile or system once it is picked from the rack. Finally the customer is acknowledged by receiving a bill (SMS).**

I. INTRODUCTION

This project aims in Iot (Internet of Things) that integrates network information systems to real world entities. It connects objects such as smart phones, products with sensors through the internet allowing them to interact and exchange information among themselves. This consists of three main parts, entry level, product side, exit level. Entry level allow access for the customers to get into the store, it is done by RFID verification. The product is embedded with Ultrasonic Sensor , it senses the product taken by the customer.

Finally automatic billing at the exit level and a SMS is received with their bill. The customer is tracked by indoor GPS.

II. WALK IN

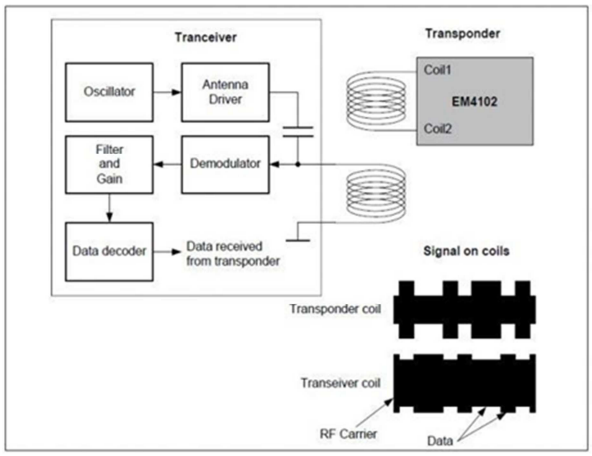
The entry is accessed by RF id identification which is implemented by showing the RF id card across the reader.

A. RF ID Reader (EM18 MODULE):

The EM-18 RFID Reader module operating at 125kHz is an inexpensive solution for your RFID based application. The Reader module comes with an on-chip antenna and can be powered up with a 5V power supply. Power-up the module and connect the transmit pin of the module to recieve pin of your microcontroller. Show your card within the reading distance and the card number is thrown at the output. Optionally the module can be configured for also a weigand output.

B.Working

The module radiates 125KHz through its coils and when a 125KHz passive RFID tag is brought into this field it will get energized from this field. These passive RFID tags mostly consist of CMOS IC EM4102 which can get enough power for its working from the field generated by the reader.



3.RF ID CARD:

A RFID chip is another term used to define a RFID tag. It is a tag, label or card that can exchange data with a reader using radio frequency (RF) signals. It usually has a built-in antenna and an integrated circuit IC). The antenna can send and receive radio waves, while the IC takes care of modulating and demodulating the radio signals, as well as processing and storing data.

III. PRODUCT SIDE

A. *Block diagram:*

B.Arduino uno:

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Each of the 14 digital pins on the Uno can be used as an input or output, using pinMode(), digitalWrite(), and digitalRead() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20- 50 kOhms.

C.Ultrasonic sensor:

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit.

The basic principle of work: (1) Using IO trigger for at least 10us high level signal, (2) The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back. (3) IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning. Test distance = (high level time×velocity of sound (340M/S) / 2

IV. WALK OUT:

A. Automatic billing:

The billing section is again composed of all the components present in the billing section. It is composed of indoor gps and a system. The received analog signal is decoded back to digital which is sent to the system's database. It consists of information about the products. The attributes present in the databases include product ID, issued by the market, code, used by the database to match the product and recognize it. Particulars, regarding the name of the product. The quantity of the product, and finally the rate and amount of product. This reduces the average time spent by the customer in the supermarket as they can proceed with the bill.

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