Smart Shopping System using Lightweight IoT Protocol

Dr. R Sujatha

Associate Professor, Dept. of Electronics with

specialization in IoT and Sensors,

School of Electronics Engineering,

VIT University.

Garvit Gupta

Shashank Mauli

Vellore Institute of Technology, Vellore

Tamil Nadu, India.

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INTRODUCTION

The increase in Internet technology has brought all the food items at our doorsteps but freedom to carefully selection of the best product according to our convenience and analyzing the touch and feel of it.

But, the major drawback however is the stretched-out line of customers for paying the bill which nowadays is becoming really hard to manage.

The brought forward smart shopping structure avoids this drawback and also has additional features for the convenience of the consumer.

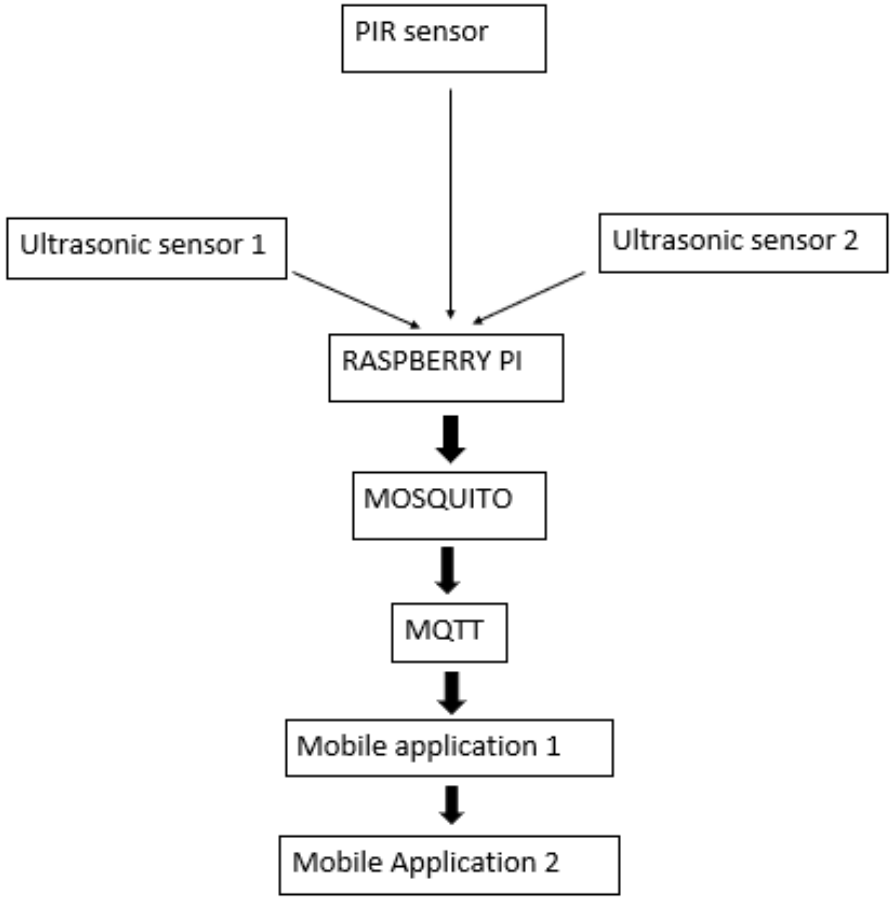
LITERATURE SURVEY

Mr. P. Chandrasekar and Ms. T. Sangeetha IEEE 2014	"Smart Shopping Cart with Automatic Billing System through RFID and ZigBee"	In this paper, the author talks about the automatic billing system by scanning the RFID tags on the cart.
Kalyani Dawkhar, Shraddha Dhomase, Samruddhi Mahabaleshwarkar	"Electronic Shopping Cart for Effective Shopping based on RFID"	The author talks about the Electronic Shopping cart that again uses RFID technology to scan
Dr.Suryaprasad J, Praveen Kumar B O, Roopa D Arjun A K NESEA 2011	"A Novel Low-Cost Intelligent Shopping Cart"	The paper talks about using cost effective protocols and devices to build a smart shopping cart
Galande Jayashree, Rutuja Gholap, Priti Yadav 2015, publicationIJETAE	"RFID based Automatic billing trolley"	Similar to the above papers, this too talks about automatic billing of the products in a trolley using RFID technology.
Alex Polacco and Kayla Backes Journal of Business and Management, 24 (1), March 2018	"The Amazon Go Concept: Implications, Applications, and Sustainability"	This paper talks about the applications of the Amazon Go Shopping Cart.

COMPONENT SPECIFICATION

- Raspberry Pi
- Ultrasonic Sensor
- PIR Sensor
- MQTT Protocol

SYSTEM ARCHITECTURE



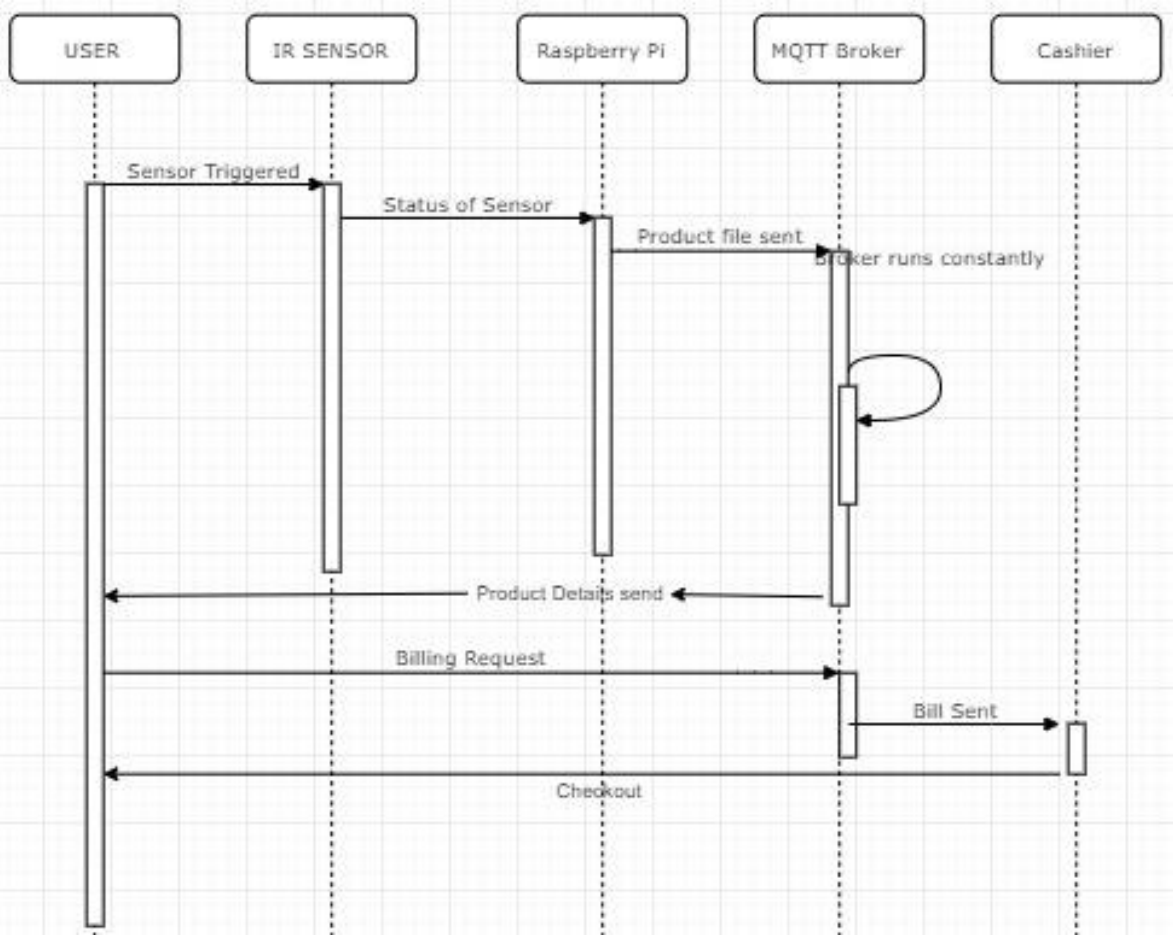
- The three sensors when triggered, sends the corresponding product's details to the Raspberry Pi which at last reaches the customer who has triggered the sensor, via a communication protocol – MQTT protocol.

- The customer can specify the quantity of purchased product and can finally head to check-out and pay the bill

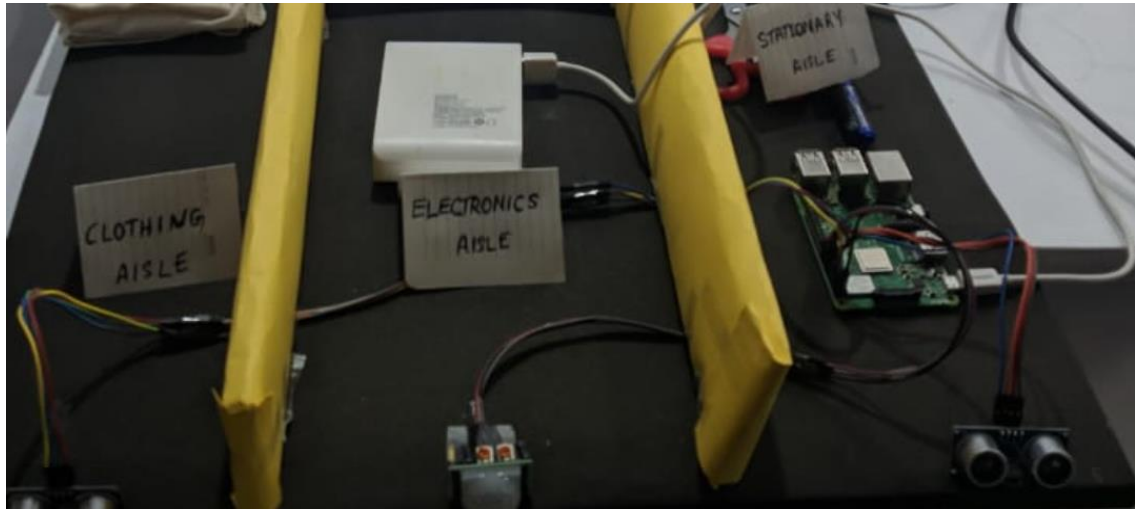
ALGORITHM

- The Raspberry Pi is used to accumulate the information, process is it and send it using MQTT protocol to the registered users via an in-built WIFI module.
- This protocol, uses publish and subscribe method, where in, clients are subscribed to a topic generated by a central broker, which is the Mosquitto Broker in this project.
- The mobile application for the customer is made on Android Studios and the product details are stored in JSON format.

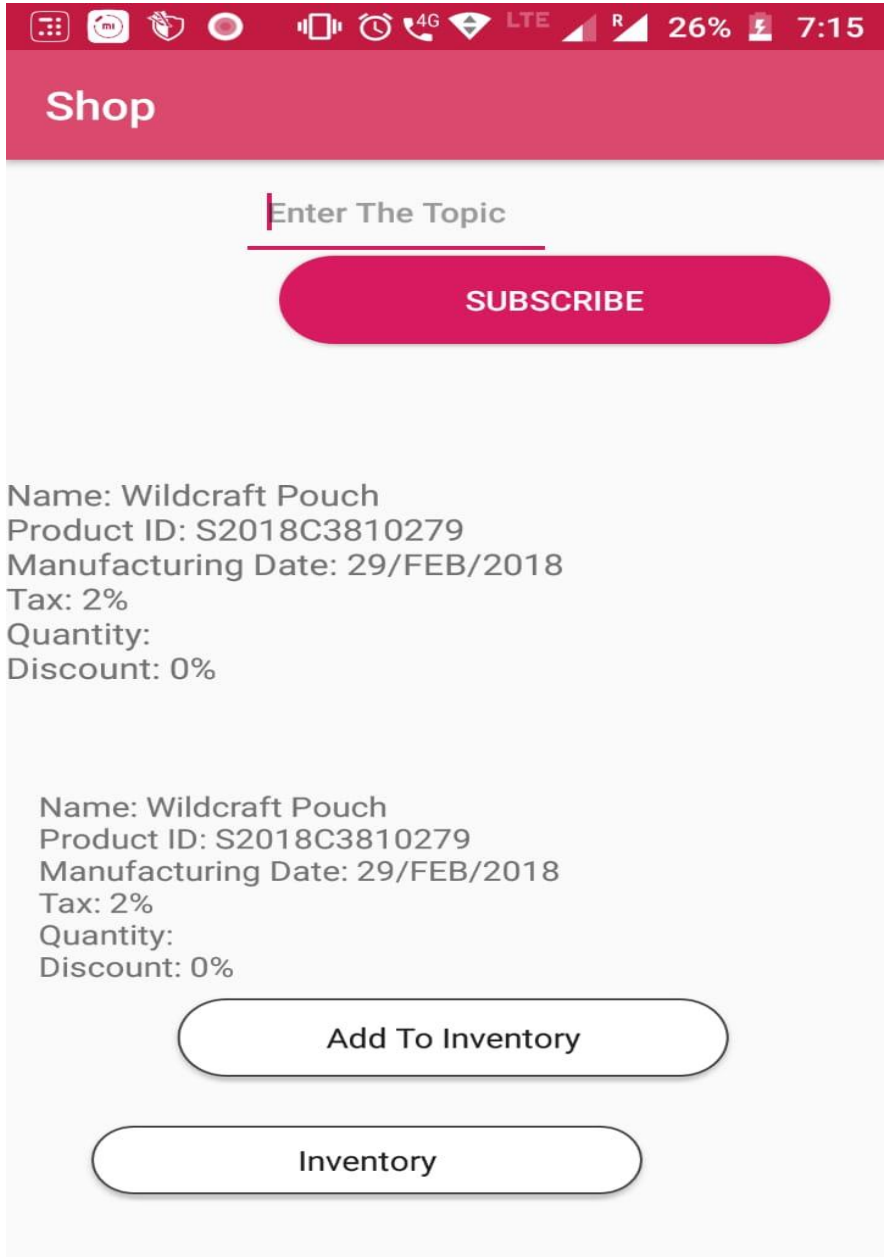
IMPLEMENTATION

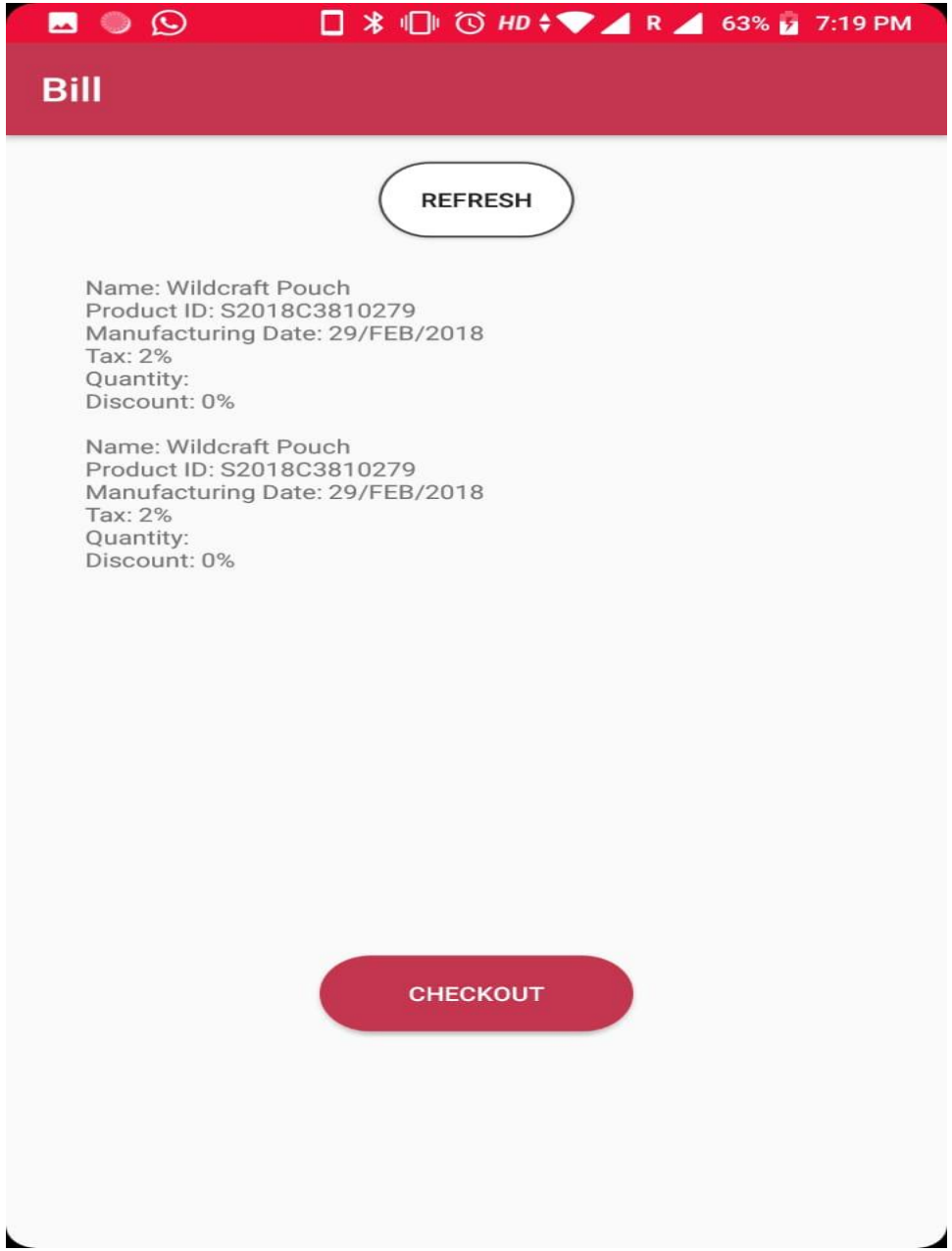


- The smart shopping system consists of sensors that detect human movement. As soon as the customer walks by a product, the sensor is triggered and the corresponding product details are displayed on the customers phone via the application.
- Whilst dropping the product to their trolley, they must also add the product to their cart on the app along with its quantity.
- All the information regarding the product associated with it is stored and sent to the mobile application using MQTT protocol.
- When the customer wishes to leave, they can hit bill on their application, which sends the entire bill of the customer to the cashier.


CLOTHING AISLE
ELECTRONICS AISLE
STATIONARY AISLE


EASY SHOP
SUPER-MART


26% 7:15
Shop
Enter The Topic
SUBSCRIBE
Name: Wildcraft Pouch
Product ID: S2018C3810279
Manufacturing Date: 29/FEB/2018
Tax: 2%
Quantity:
Discount: 0%
Name: Wildcraft Pouch
Product ID: S2018C3810279
Manufacturing Date: 29/FEB/2018
Tax: 2%
Quantity:
Discount: 0%
Add To Inventory
Inventory


63% 7:19 PM
Bill
REFRESH
Name: Wildcraft Pouch
Product ID: S2018C3810279
Manufacturing Date: 29/FEB/2018
Tax: 2%
Quantity:
Discount: 0%
Name: Wildcraft Pouch
Product ID: S2018C3810279
Manufacturing Date: 29/FEB/2018
Tax: 2%
Quantity:
Discount: 0%
CHECKOUT

CONCLUSION

- This prototype involves in providing the customers with a new and easy shopping experience.
- New technologies are implemented to provide the lowest delay time and smarter solutions.
- The customer doesn’t have to wait till the checkout or use their calculators or prick their heads to know how much the shopping cost has come up to and to see if they got it within their money constraints using the alert.

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THANK YOU