

IOT based Smart Shopping with Cloud and Wireless Sensor Integrated Live Cart Automated Billing

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Abstract:

A imaginative element with societal appreciation is the one that directs the comfort, lodging, and productivity of normal daily life. Acquiring and shopping at major shopping centres in metro urban areas is wrapping up day by day activity. We can see a big surge on siestas and weekend ends at these shopping centres. Individuals buy distinctive stuff and bring it in trolley. After transactions are made, one has to go to charging counter for instalments. The clerk set up the bill using uniform identification per user while charging counter which is extremely repetitive procedure and results in a long line at charging counter. In this Text, We're talking about the item "Smart Shopping Cart" being created to help a man make daily shopping to the point that the time spent purchasing is minimized. The primary objective of the proposed system is to include a located innovation, minimal effort, efficient adaptability, and rough structure to support face-to-face shopping. The framework produced consists of three main segments / modules (a) Database Correspondence portion (b) User interface and segment view, and (c) Manual segment charging. Server Communications shapes and retains the shopping basket relationship with the primary site. The UI and Display section allows the UI and Automated charging section to handle charging in conjunction with the Server Correspondence. These 3 modules are organized into an integrated system and are attempted to accomplish the usefulness. The produced model is prepared as by using the RFID sensor that scans the RFID tags in the product of the shop, spoken about for business enterprise with reasonable concern of security and device problems.

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INTRODUCTION

Now-a-days to buy the groceries we need to go to the groceries shop and pick up all the products we needed and then here comes the big deal in the billing counter there will be a very big line to take the products. Specifically for the category so that makes a lot of sense but also we feel that this way just the optimization is a little bit better but of course you can also use them in the rent in a general groceries store alternatively if you don't have like best sellers or a categories that make sense you can also just test them randomly and in this case for example you can pick like 30 percentage of the products and you can push all of them unchanged I'm baffled today they we still rely on technology from nearly 80 years ago to help us gather our fruits vegetables and cookie dough ice cream that's all about to change to smart shopping right so that's definitely one thing you can do the thing is as said the key is simply don't let the normal shopping cart but change the shop to the intelligent smart shopping cart, Products on smart very important to keep that in mind just messy then you can use labels to segment so that's question that I get all the time if you want to build a smart shopping you can just make an device which can find its application in places like supermarkets and shopping malls is a tedious task the billing process is very time consuming and this results in long queues so in order to optimize this process and for carrying things and helping you shop but with all the new technologies that are out there's lots of interesting things you can do so if your increase the overall efficiency our system comes to the rescue the system can be installed in a shopping trolley an RFID reader which scans the product as the user adds more items they are detected by the module and the total bill increases similarly if the user removes items from the cart then those items will be deducted from the total bill finally the user can press a button to end the shopping and add the items to the total bill as the exit point the shopkeeper can verify

the shopping details by referring the master path so let's turn in on the system has been initialized the system is beating or the master card the system is now in registration mode the user must register the master card and the products so this master card acts as an money withdrawal automatically from the bank or the respected shopping mall company access card after the adding the products to the database which means that the rfid tags of the products has been scanned and the customers can get access to the buying the products with automated billing cart by the rfid reader which was attached to the shopping basket. As soon as the items tags has been scanned the system has now been initialized and we can now add items to the cart. The user can press the check bill button that could check the total bill in case the user feels that he or she is carrying some unnecessary items then they can be removed from the trolley by scanning the same product again it can be removed now they usually can proceed towards processing the final bill the user must approach the shopkeeper with the master card or shopping mall access card so in this way the billing process has been completed successfully without any hassles and all the updated products of all the buying selling call be monitored through the both the mobile application and also as well as web application all the values are updated in the cloud by the MQTT protocol.

The customers who are willing to buy the products in the shopping are expected to read the barcode on the package. The barcode must be visible on the package sheet. Line of sight required for a barcode read. Barcode readability can be affected by soil, dust, abrasion or package contours Limited reading time. Barcode does not have the power to READ & WRITE. So it takes lots of time for the customers to scan and buy the product

Proposed Work

In this paper we proposed that the technologies used in the Smart shopping cart are node micro controller unit, wifi module, RFID reader, RFID tags, Fire sensor, Gas sensor, Alarm , power supply, cloud MQTT protocol the node micro controller unit is used

as a prime controller inside the node micro controller unit we have ESPE266 wifi module through the ESP module we are going to publish the data to the cloud through the MQTT (Message Queuing Telemetry Transport) protocol by Publish-Subscribe client method in to the cloud in which we can get the access through the mobile application and also as well as web application in both the applications we can get the live data of the products that are sold by the customers and also how much stock are in available in the shopping mall By using the HTTP protocol we use GET POST method by this there is a chance of sql injection so by using MQTT it checks to the three conditions for the server, user name and port number so by this we can stop cracking cloud.

Related Work

E-Commerce systems enhance collaboration between the different parties engaged in the interchange of goods across the program, as well as the handling of information relevant to the process. The growing value of online business is evident in the analysis undertaken by the Gvu (Graphics, Simulation and Usability) Centre at the Georgia Institute of Technology. In their overview of the results of the Eighth Study, analysts note that "web-based company is taking off both in terms of the number of consumers shopping as well as the overall amount that individuals pay on Internet-based transactions." More than seventy-five per cent of the 10,000 respondents reported buying items online [1].

The GVA analysis also reveals that trust in the protection of online business is growing. If more people gain interest in current developments in cryptography, an ever increasing number of clients will be expected to purchase items on the web on a regular basis. A strong web-based industry website Accompanying features can be added to shoppers for greater comfort Understanding whether it was saved or not saved

in a shopping cart. Returning to separate areas of the web when applying items to the shopping bag. Fast browsing and picking the material in a overview. Effective of all the combining of products. Easy path from landing page to data and requests for specific entries. Clear shopping or grab relations.

Enable and efficient protection alerts or communications. Good design of the item info. Information is another significant element in the development of a web-based business website. The intelligent process between the client and the server is not finished until the server responds to the request Submitted by.

This test is focused on a smart shopping cart built on RFID. Since the development of wireless technologies, e-commerce began to expand faster. The rise of e-commerce brings ease, security and productivity to the daily life of the consumer. We explored the idea of RFID, which is a very recent technology. The whole shopping cart is based on RFID technology. The key goal of this system is to reduce the long wait of the billing center. The key goal is to provide assistance in the area of daily shopping in terms of time reduction. In RFID-based technologies, RFID tags were used to manage the whole database and billing cycle [3].

The purpose of the written analysis is to draw on the vastness of the general field of research at that point in time and discern a position where another contribution could be made. The purpose of this analysis is to critically evaluate the different approaches used in the field in order to determine the appropriate approach for the investigation of the thesis in question. This involves numerous articles [4] where new concepts and techniques are constantly proposed along these lines, it is important to examine the continuing trends of this writing. In line with these points, we have given the need to break down the writing of a couple of ongoing years on the basis of various advancements used. This indicates that the discovery of the described enterprise is still a growing field [5].

Electronic Commerce (e-commerce) systems facilitate the contact with the various parties participating in

the exchange activity across the network, as well as the control of the data involved in the process[6].

By using the wireless sensor networks like zigbee, wifi module, Bluetooth the human work is going to be reduced and thus the work is going to be simple The exponential increase of such devices in a network of conversation powers the Internet of Things (IoT)[7]

As of from the existed model we are going to develop an new technology of an MQTT protocol which we are sing publish subscribe client protocol in which data is published by the company and the customer can be subscribed by the cloud protocols of web and the android applications [8].

System Architecture:

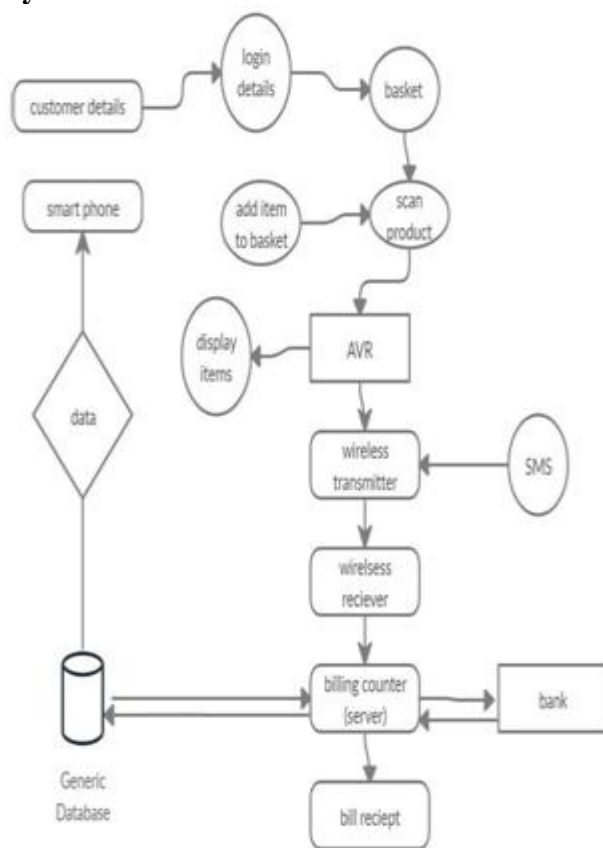


Fig1: Architecture of the System

Algorithm

Step1: Start
Step2: Initiate the framework
Step3: Search for RFID
Step4: Scan the shopping access card
Step5: Scan the RFID tags
Step6: Read the data of your product
Step7: Update the values in the cloud by MQTT protocol
Step8: If you want to remove the card re scan the product to remove item
Step9: check the cloud mobile application for the live update of cart detection.
Step10: Print the bill
Step11: Stop.

BlockDiagram:

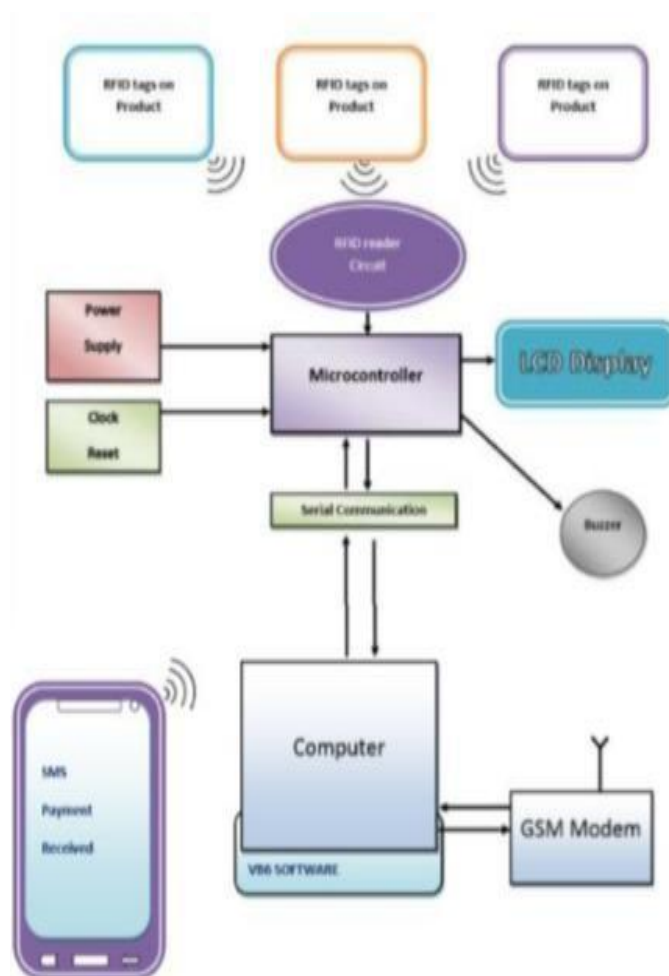
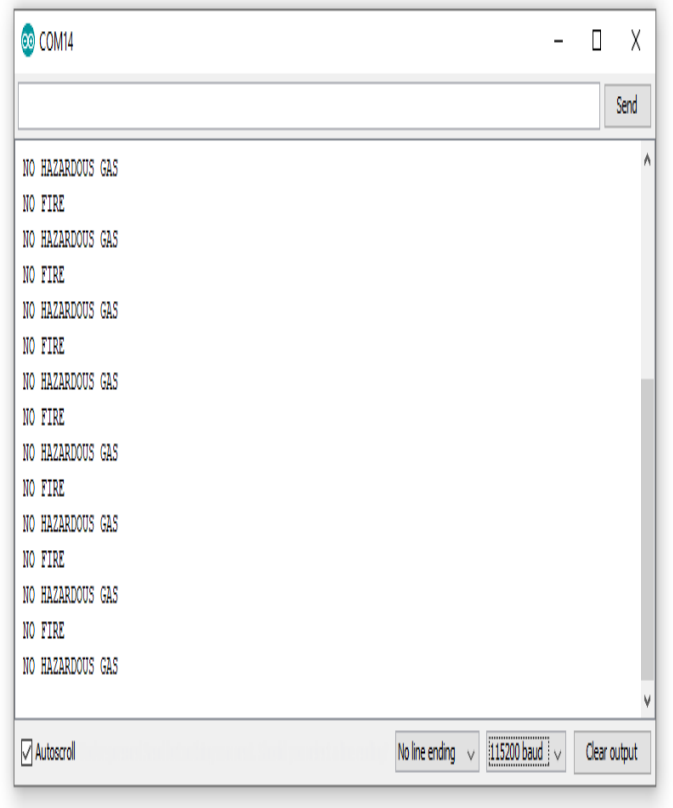
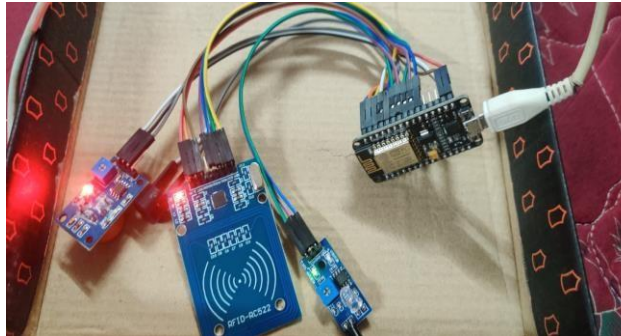


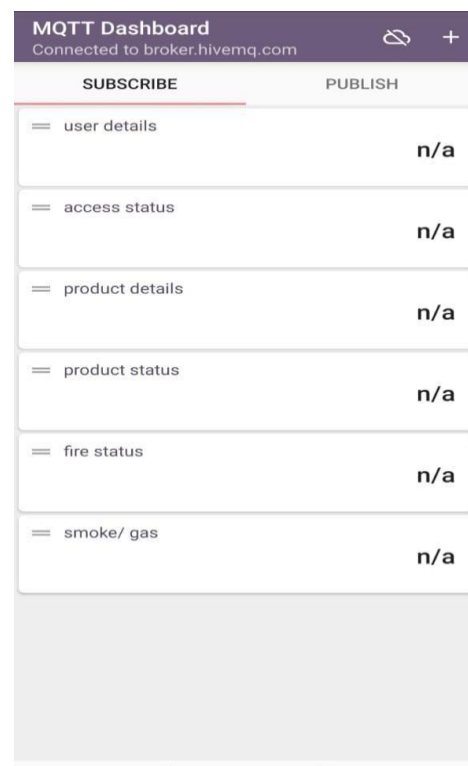
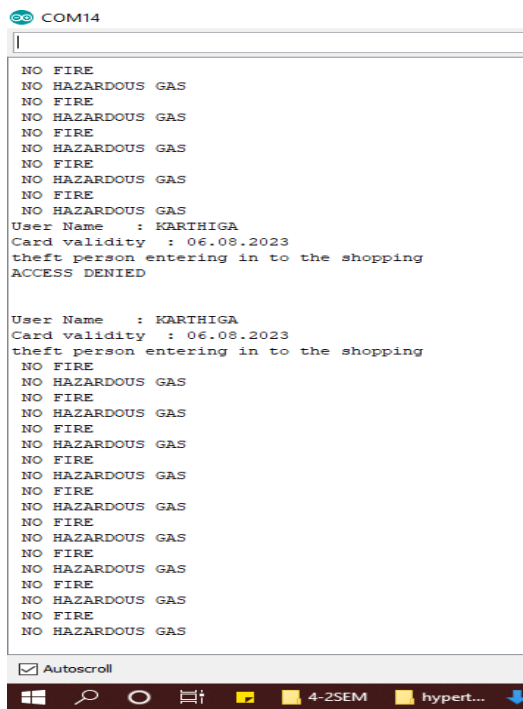
Fig2: Block diagram of the System

Results and Discussion:

Hardware Implementation:



Outputs:



Conclusion:

In this paper we developed an IOT model that detects the products with the RFID tag by the RFID reader which is connected to the node micro controller unit the node micro controller unit is used as a prime controller inside the node micro controller unit we have ESPE266 wifi module through the ESP module we are going to publish the data to the cloud through the MQTT (Message Queuing Telemetry Transport) protocol by Publish-Subscribe client method in to the cloud in which we can get the access through the mobile application and also as well as web application in both the applications we can get the live data of the products that are sold by the customers and also how much stock are in available in the shopping mall By using the HTTP protocol we use GET POST method by this there is a chance of sql injection so by using MQTT it checks to the three conditions for the server, user name and port number so by this we can stop cracking cloud.

References:

1. P. Castillejo, J.-F. Martinez, J. Rodriguez-Molina, and A. Cuerva, "Integration of wearable devices in a wireless sensor network for an e-health application," *IEEE Wireless Communications*, vol. 20, no. 4, pp. 38–49, 2013.
2. Sambari International Journal of Advanced Research in Computer Science and Software Engineering 6(9), Volume 6, Issue 9, September - 2016, pp. 457-461
3. Ms. Rupali Sawant, Kripa Krishnan, Shweta Bhokre, Priyanka Bhosale, The RFID Based Smart Shopping Cart, March-April, 2015.
4. Kalyani Dawkhari, Shraddha Dhomase, Samruddhi Mahabaleshwarkar "Electronic Shopping Cart For Effective Shopping based on RFID", *International Journal of Innovative Research In Electrical, Electronic, Instrumentation And Control Engineering* Vol. 3, Issue 1 pp 84-86, January 2015.
5. Mr. P. Chandrasekar and Ms. T. Sangeetha "Smart Shopping Cart with Automatic Billing System through RFID and ZigBee", *IEEE*, 2014.
6. "MTS/MDA Sensor Board Users Manual," Crossbow Technology, Inc., June 2007
7. "India's Largest Malls - 2010," *asipac*, Mar 2010, [Research Studies On Malls in India.
8. https://www.researchgate.net/publication/316911763_Internet_of_Things_Survey_and_open_issues_of_MQTT_Protocol
9. Shivani Titarmare, Monali Thakre, Rasika Shingote, Sakshi Shukla, Vikram Deshmukh "RFID Based Smart Shopping Trolley With IR Sensor". *International Journal of Scientific Research in Science and Technology*, Volume-3 Issue-2, 16th February 2017.
10. Yathisha, L., Abhishek, A., Harshith, R., Darshan Koundinya, S.R., Srinidhi, K.: Automation of shopping cart to ease queue in malls by using RFID (2015)
11. Vrinda Gupta, Niharika Garg, Analytical Model for Automating Purchases using RFID-enabled Shelf and Cart, 2014.
12. Kalyani Dawkhari, Shraddha Dhomase, Samruddhi
13. Mahabaleshwarkar "Electronic Shopping Cart For Effective Shopping based on RFID", *International Journal of Innovative Research In Electrical, Electronic, Instrumentation And Control Engineering* Vol. 3, Issue 1 pp 84-86, January 2015.
14. Mr. P. Chandrasekar and Ms. T. Sangeetha "Smart Shopping Cart with Automatic Billing System through RFID and ZigBee", *IEEE*, 2014.
15. "MTS/MDA Sensor Board Users Manual," Crossbow Technology, Inc., June 2007
16. "India's Largest Malls - 2010," *asipac*, Mar 2010, [Research Studies On Malls in India.
17. https://www.researchgate.net/publication/316911763_Internet_of_Things_Survey_and_open_issues_of_MQTT_Protocol
18. Shivani Titarmare, Monali Thakre, Rasika Shingote, Sakshi Shukla, Vikram Deshmukh "RFID Based Smart Shopping Trolley With IR Sensor". *International Journal of Scientific Research in Science and Technology*, Volume-3 Issue-2, 16th February 2017.