Smart Shopping Cart with Automatic Pricing, Product Information and Recommendation System

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***Abstract*— In today's 21st century, most family do spend their time while doing the shopping on the stores, stores and department stores. Every stores people usually carry the carts themselves and fill the desired items and then carry the carts to the cashier where they have to wait in long queues but now they have to replace the old traditional carts with modern Automatic carts. It is exactly our project. The main idea of this project is to make the purchase, user can scan/swipe the RFID tag connected to the product and the RFID reader connected to the car and display all the money on the Android mobile screen. We also provide the opportunity to send messages to customers' mobile numbers. This systemnot only reduces long waiting times in queues and moves cars automatically, but also helps them control and analyze there spending while doing shopping, which makes a very big differences in their business.**

Keywords— Automatic Trolley, Recommendation System, RFID, Message notification, Product scanning, Shopping technology, Mobile app integration.

I. INTRODUCTION

Technology has always been an inspiration for new ideas an d connection between people, and modern technologies suc h as the Internet of Things and business automation again m ake it easier to connect people. Since the dawn of science an d technology, it was thought that innovation would reduce u nnecessary problems and increase efficiency. Shopping, sho pping etc. is one of the most important things in today's wor ld. Therefore, the addition of smart stores where customers can pay their personal bills and register using their mobile n umbers while purchasing products will give an improvemen t to shops and stores.

Help customers. You can view all your earnings at any time while the store is closed and invoices will be sent to the cus tomer's phone number.

II. LITERATURE SURVEY

[1] **Paper Name -:** Smart Cart with Automatic Billing

Author -: Chandrasekar Palanisamy, T. Sangita Publisher-: International Journal of Engineering Research & Technology, 2020.

Observation-: In this paper [1], they made a model of the system in which each car will be equipped with RFID reader and Zigbee transceiver. In addition, RFID tags willbe attached to all products in the store or market. Supermarkets are places where consumers buy and pay forproducts, they use every day. For this reason, it is necessary to calculate the number of products sold and create prices according to customers. When we go shopping at the market, we should choose the right products carefully. And after that the delivery of the invoice for all the products is very hectic. Therefore, the proposed system which help user to do smart shopping. There is a RFID tag which user can swipe on the rfid scanner once swipe is done than it will reterive the product id. Product id will be matched in database based on that amount will added in bill. Recommendation is done based on product enter in the cart. This recommendation take past purchased history of the users and based on that recommendation is given. Billing is also done by using rfid tag attached with trolley. Disadvantage was online payment cant be done so user have to wait in queue.high cost.

Paper Name-: Smart trolley and billing system

Author-: Dr. Subburam, Anitha R

Publisher-: Science Direct

Observation-: This article presents a smart car that can track purchases and pay using RFID tags. It will scan the cutting and payment process in the cart. In today's world, shopping has become a daily activity. We can see long queues waiting to pay in many stores. The aim of our project is to overcome errors

and prevent loss of time. To overcome the above problems, we propose a smart car thatwill scan products and pay online using RFID tags. It automatically identifies and identifies the product and the final checkout is done by the shopping cart itself. Thus, customers do not have to wait in long queues. It also has an RFID-based energy management system. This model isnecessary and useful in smart car for the new operation ofIoT. The main purpose is to provide technological tools, save time and develop business-oriented products. The system will also offer product recommendations based on the customer's purchasing history. In our project, we will give all the product with RFID tag attached to each shopping cart. These features will save time and make shopping easier. We canhave the best shopping experience overall.

[2] **Paper Name-:** Collaborative Product Recommendation System for E-commerce Websites

Author-: S. Ganesh Sundaram

Publisher-: IEEE

Observation-: Product information is an important factor in convincing customers to buy products correctly on any e-commerce site. Online user reviews are all based on each user's actual experience, which will have increasingly important information for people. Recommendations will be important in terms of price, performance, previous purchase indications and much more. In this article, we aim to beautify the service provider by comparing the popularity scores across all rankings for a particular product on various e-commerce sites. Ultimately, the number of products can be reduced by up to a third of the total product to reach the group where people like to buy the product. Finally, only a few products are recommended to users through a five-point scale that allows users to filter and guide.

[3] **Paper Name-:** The automated shopping trolley for supermarket billing system

Author-: Sainath (2014)

Observation-: Exploited barcode for billing of products, where customer scans the product using barcode technology. The bill will be forwarded to the central billing system where customer will pay them by showing unique id. The limitation of barcode scanning requires line of sight for scanning and it should be fixed within its boundary.

[4] **Paper Name-:** Cash register lines optimization system using RFID technology

Author-: Budic (2014)

Observation: Paper developed a system for shopping using RFID. The RFID is employed for scanning products and the information is stored in the database which could be paid online or in a central bill. It also uses web application to maintain entire shopping details. It requires maintenance of web application server. No necessary steps have been taken for the products that are accidentally dropped into the trolley by the customer.

[5] **Paper Name-:** IOT based intelligent trolley for shopping mall

Author-: Dhavale Shraddha (2016)

Observation: In this paper applied RFID technology for billing during purchase in shopping malls and IOT is used for bill management by means of ESP module. The payment details will be sent to the server by which central billing unit will deal with customer's payment. The ESP module will be working as a short distance Wi-Fi chip for wireless communication. But there is a drawback which includes constraints such as distance and interference. Server will be busy if customers are high and internet connectivity should be stable for finishing the process.

[5] **Paper Name-:** Smart shopping trolley using RFID

Author : Komal Ambekar (2015)

Observation: This paper implemented smart way of shopping trolley with RFID and ZigBee by which bill is generated by scan of products in the reader and bill transmitted to central billing department by which bill can be paid at the counter which is a major difficulty for the customer.

[5] **Paper Name-:** Smart shopping cart with customer-oriented service

Author: Hsin-Han Chiang (2016),

Observation: This paper accomplished a concept of automated shopping trolley with automated billing where they used face recognition for customer authentication. It is not a simple process as face recognition of customers during shopping hours will not be easy and accurate as malls can be crowded. Many errors are possible while using recognition for authentication.

[5] **Paper Name-:** Smart RFID based Interactive Kiosk Cart using wireless sensor node

Author: Narayana Swamy (2016)

Observation: applied RFID for automated shopping. They used dedicated website for billing maintenance and for user interaction. Every user with the unique id accesses the webserver for the bill payment and invoice information. Internet service is mandatory in this type of service. So, the process may fail due to internet instability and server error problems may also occur due to high load.

[5] **Paper Name-:** Shopping and automatic billing using RFID technology

Author: Vinutha (2014)

Observation: This paper has an automatic billing with server end. This scans products by radio frequency identification and then the bill is generated at the server end which is then communicated to the customer. This requires server maintenance and internet connectivity both for the customer and shopkeeper. [5] **Paper Name-:** Smart shopping cart with automatic billing and Bluetooth proposed

Author: Prateek Aryan (2014),

Observation: This paper has a process where billing is done in a trolley and transferred to the android mobile of the user via Bluetooth. Every customer can't be expected to have a smart phone and Bluetooth can have connectivity issues and range is less. Automated smart trolley with smart billing using Arduino by Suganya (2016), developed a model of automatic shopping with Arduino and an android application which again requires network to be connected always. Android operated mobiles may or may not be present with every customer.

III. SYSTEM ARCHITECTURE

We will use Arduino uno which will be connected toandroid app using Bluetooth
Hardware will be developed using IR sensor and RFID scanner/reader. Whenever user put the product in trolley itwill send notification to android app.

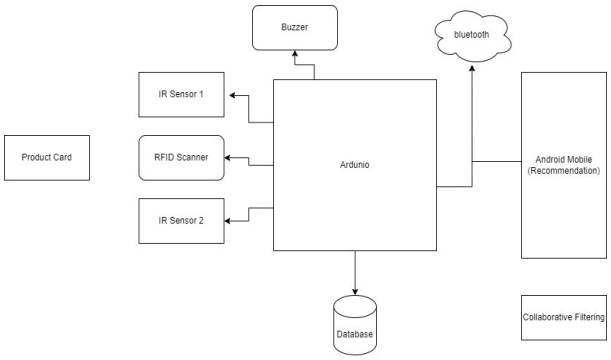

Fig 1. Architecture Diagram

Android app will update the price and will provide the recommendation
At the time of registration in android app we will ask likesof the user and based on that we will recommend the products.
When user checkout google pay will be open for payment.

IV. COMPARISION

A. Existing System:

We are currently using this method in shopping malls that use barcode scanners. Suppliers use barcode scanners to scan merchandise. This is a slow process and customers have to wait in long lines. People want to leave the mall and wait for long lines to buy some products. In order to avoid this situation, we want to buy more products. In recent years, new technologies have been introduced that require buyers to put goods in a smart shopping cart, each with its own identifier.

V. PROPOSED SYSTEM

A. Customer Registration and Login

Customers must first create their own account in the application. Customer details will be stored on the web server.

B. Store Database Maintenance

The store database will have all the information about everything. This is where product-related information is stored and managed. Customer account information and billing information will be stored here.

C. Shopping cart selection

Once the user enters the mobile application, the system will ask you to scan the shopping cart. The carrier will be identified by the SSID with a unique pattern. The user canselect a particular cart after reviewing all the carts. When selected, the phone will connect to the cart via Bluetooth, allowing them to communicate.

D. Shopping using the shopping cart and mobileapplication

When the mobile application and the shopping cart are connected via Bluetooth, the customer can start shopping.

VI. CONCLUSION

In conclusion, the development of this System is a significant leap in the realm of retail technology. This innovative solution combines the convenience of automated billing with the power of real-time product information and personalized product recommendations, ultimately enhancing the shopping experience for consumers. It not only streamlines the checkout process, saving time for shoppers and reducing the scope for errors, but also provides a wealth of information products, promoting informed purchasing decisions. Additionally, the product recommendation system leverages advanced algorithms and data analysis to cater to individual preferences, offering a more personalized and engaging shopping journey. The combination of these features makes the Smart Cart a promising solution for both retailers and customers, optimizing the retail ecosystem while enhancing the customer experience.

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