A Technique for an Efficient Hybrid Shopping Mall

Harshit Kalra, Vishal Nainwaya, Karishma Mahajan,

CSE Department, SRM Institute of Science and Technology, NCR Campus, Modinagar U.P. India

Abstract - The combined version of offline and online shopping technique is the base objective of this project. In the working application of this idea, a facility of combined shopping and pay later facility is tried to be implemented. Wherein, the users are allowed to shop normally, as done in an offline scenario but will only scan the NFC card for each item and after the completion of the shopping, payment has to be made at the payment booths. At the payment booths the customer can modify the cart by viewing the bill and edit accordingly and thus a bill will be generated. After the generation of the bill the customers can collect their purchased items for the collection counter. Thus, this idea can provide an offline and online shopping experience to its customers. Here all the products that user wants to purchase (added into cart) will be directly available at the collection counter. Also user can compare the qualities of same product of various brands, thus making it user friendly. The report describes analysis, implementation and design of SMART MALLS that uses features of both offline and online shopping system.

Keywords: SmartMalls, Shopping, Arduino, Reader Module, Near Field Communication, Java IDE

I. INTRODUCTION

The online shopping system seems to be leading the offline business industry due to their convenient and anytime-anywhere access features. On the other hand, Offline malls offer us handy shopping, good feel of the products and in-time delivery, but it faces the issues of bottleneck at the cash counters, the hazel of carrying carts, and is time consuming. It also requires the in house staff to manage the displayed products regularly. Officially shopping malls are defined as “One or more buildings forming a complex of shops representing merchandisers, with interconnected walkways enabling visitors to walk from unit to unit.” Un-officially, they are the heart and soul of business communities, the foundation of retail economies, and a social sanctuary for teenagers everywhere.

II. COMPARISON OF ONLINE AND OFFLINE SHOPPING

When we see the disadvantages of offline and the online shopping combined we can find a collaborative solution as the disadvantage for

one serves as the advantage for the other, thus nullifying the entire drawback for either of the two.

The various drawbacks of online and the offline can be stated as:

1. Disadvantages for Offline Shopping and its Solution in Online Shopping

- There is a limitation of availability of offline shops and each shop has a limitation of space so you have no such choice of wide variety of availability.

  Solution: You find less variety of options for the products or services when buying offline. Also there is a wider range of choices to choose in online shopping. One can find endless shopping websites and find a huge option for a single item you want to buy.

- As far as money is concerned, the price of a product may be costlier in an offline shopping.

  Solution: On online shopping portal prices are highly competitive and also one can find a variety of discounts and other similar offer, the price in an online shopping will be lower one in an online shopping.

2. Disadvantages For Online Shopping And Its Solution In Offline Shopping

- In Online Shopping The Actual Appearance And The Visual Acceptance On An Individual Is Not Righteous. Also The Credibility For The Product Cannot Be Assured.

  Solution: A Check On The Credibility Can Easily Be Done When The Customer Is In Direct Contact With The Actual Seller.

- Internet Can Have Various Defaulters And False Sellers, Which Seems Authentic But Is Not In Real Time.

III. ARDUINO BOARD

Figure 1: Arduino UNO Board

This is the latest revision of the basic Arduino USB board. It connects to the computer with a standard USB cable and contains everything else you need to program and use the board. It can be extended with a variety of shields: custom daughter-boards with specific features.

IV. READER MODULE

Figure 2: Reader Module

This module directly connects to any microcontroller UART or through a RS232

converter to Personal Computer. It gives UART/Wiegand26 output. This RFID Reader Module works with any 125 KHz RFID tags. Power is provided through external 5V adapter or a USB cable. Current is less than 50mA. It has an operating frequency of 125 KHz and read distance of 10cm.

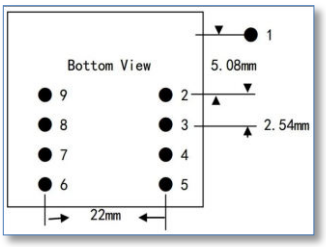

Figure 3: Pin Diagram Reader Module

V. NFC CARD (NEAR FIELD COMMUNICATION)

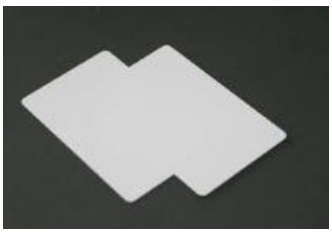

Figure 4: NFC Cards

Near-field communication (NFC) is a set of communication protocols that enable two electronic devices, one of which is usually a portable device such as a smartphone, to establish communication by bringing them within 4 cm (1.6 in) of each other. NFC devices are used in contact less payment systems, similar to those used in credit cards and electronic ticket smartcards and allow mobile payment to replace/supplement these systems. NFC-enabled devices can act as electronic identity documents and key cards. NFC offers a low-speed connection with simple setup that can be used to bootstrap more capable wireless connections.

VI. WORKING

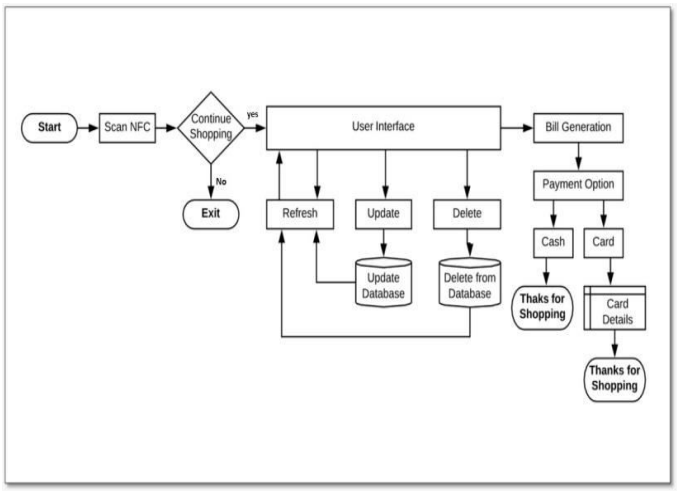

Figure 5: Flow Chart Smart Malls

The working of the SMART MALLS begins with the execution of the Hardware IDE (integrated development environment) code. The execution begins with the scanning the NFC card for the specific item as per the customer's choice and the scanning can take place 'N' number of times as per the requirements. While scanning each item, the LCD screen displays the item ID and it's quantity of purchase. Once the complete set of scanning (shopping) is done and the data is collected, it is required to be sent to the software code for the further processing. The

software code is responsible for providing the user interface to the customer, this user interface helps the customer to view their respective cart and make the further proceedings or processing. The software code is also responsible for collecting the data from the hardware IDE code inform of the 2-Dimensional arrays. The collected data is stored in array dimensioning the item id and the quantity for each item.

Now from the predefined database, the price and the total price as per the quantity is fetched and is displayed on the main bill generation page. This bill generation page consists of the various operations that can be done on the cart including modifications to the cart, deletion of items and generation of bill.

VII. CONCLUSION

Modern communication systems and smart phones have tremendously produced positive impact on the life of human beings. These systems make man's life easier and allow them to perform daily-life activities in a comfortable way. Through our project, we introduce an innovative hybrid model for the shopping malls and propose an advanced purchasing system for the customer. The proposed system reduces the limitations of both online and offline shopping systems and provides an efficient procedure for shopping. The idea resulted in more customer satisfaction as a customer can view various products and can then purchase the best one. It is customer friendly then the current offline shopping system where customer has to carry shopping bags from one place to another. Here all the purchased product will be billed at a single counter thus reduce the man power in carrying bags. It will also gain attention of more and more customer due to its unique feature. In terms of future scope A variety of data mining techniques can be used by researchers to simplify customer perceptions and attitudes. A Bluetooth device can be used to transfer data from device to the software. More smart NFC cards can be used, that can store more information. Using Arduino Boards will reduce the cost of prototyping, allowing companies to iterate more during development, leading to better, more functional products. Interfacing the system with a GSM can be done so that data can be transmitted through message.

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