Smart Trolley with Automatic Bill Generation using RFID

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Abstract -*Shopping mall is a place where most people get their daily necessities products such as food product, apparels, electrical appliances and many others. As per the public demand very high amount of shopping complexes are increasing day by day. Thus, the level of advancement of shopping mall system and infrastructure also varies. We have seen long queues in the supermarket that takes most of the time. While shopping consumers face many problems like worrying that amount of money brought is insufficient, incomplete information about of the items. Other than this they have to select the best product out of thousands of products. Also, want to revolutionize the entire shopping mechanism in the supermarket and attract number of customers reduce the labor cost.*

*Key Words***:RFID Card, RFID Reader, WiFi Controller, IOT, Android Application**

1.INTRODUCTION

The number of different techniques is evolving day by day which reduce the human efforts and reduce the labor cost. Compared to some foreign countries shopping mall system, there are still plenty of spaces for improvement in providing quality shopping experience to the consumers. Consumers often face problems and inconvenience when shopping. These problems include worrying that the amount of money brought is not enough for paying all the items wanted, insufficient information of the items that are for sale and wasting unnecessary time at the cashier. These are the problems that are currently faced by most consumers. There are some existing methods to solve the problems that are stated above, but the effectiveness still consider improvable. Examples of existing problem solving techniques are substituting the conventional way of keying item per item by hand to the cash register with the technology of barcode scanning where the price are stored in the barcode, and set up a customer information counter to help the consumer if there are any enquiries about the items at shopping mall.

The problems stated above might eventually be solved or else improved by the implementation of RFID technology in shopping mall. This can be done by simply attach an RFID tag to all the items in shopping mall and attach a RFID reader with an Android device through the server application this can solve all the above problems.

The enhanced Smart Trolley System intends to assist shopping in person which will minimize the considerable amount of time spent in shopping. It is also aimed in providing the store management section with real time updates on the inventory. The proposed system is based on four important technologies (i) RFID READER (ii) RFID tags for product identification (iii) Wifi module for achieving wireless communication with Server, and (iv) Android device for listing products and inventory management.
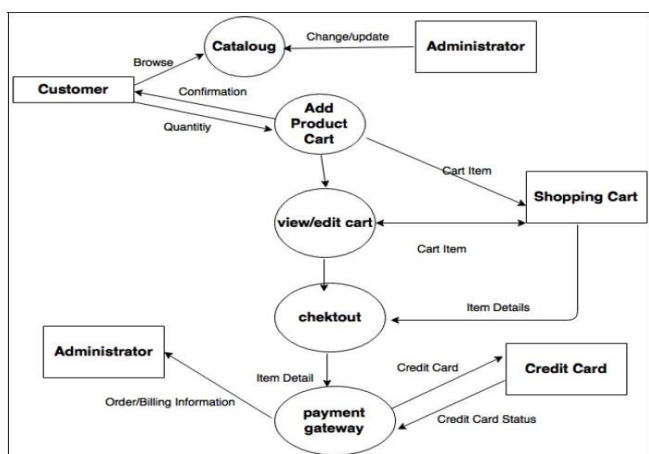
Now a days Radio frequency identification (RFID) is a promptly updating. RFID systems consist of small tags, attached to physical objects. While contenting with RFID Readers, tags respond with some identifying information that may be related with logical data records. This system is parallel to optical bar codes. In this paper, we discuss about opportunities of enhancing the cart to make it into a commercially viable product as an excellent way to

help customers reduce the time spent in shopping by displaying the list of products, their cost and automatic bill generating. The system automatic store the data in database as per every new buying product. The Smart Smart trolley has the potential to make the shopping experience more comfortable, pleasurable and efficient for the customer and the inventory control easier for the store management.

2.RELATED WORK

The main aim of the system is to proposal of a design and planning of a creative framework for obtaining of items in markets. This system is increasing flexible innovations (for example, RFID) as an approach to enhance the nature of administrations given by retailers and to expand the customer esteem consequently permitting to saving and cash. With this system we provide an excellent opportunity will be developed which assists the customers by showing products list and their costs. This approach thereby helps the inventory management unit with an automatic upgrade on each purchase of product. This smart trolley has the capability to make shopping more relaxable, comfortable and systematic for the customers as well as making easier for the store management.

3.Data Flow Diagram

4.Problem Statement

To present the smart system technique for shopping mall using RFID technology instead of using barcode technology. To implement a system that attracts the consumer to use the system. Barcode Technology: Barcode can read only one item at a time. Due to lack of knowledge failure rate in Barcodes are relatively high.

In realistic, markets are these days utilized by a considerable amount of individuals in order for securing most of the items. Item procurement speaks to an unpredictable procedure that involves time spent in passageways, item area and checkout lines. Consumers commonly encounter some problems and difficulty during purchasing. These problems comprise worrying about the money which they have brought would be insufficient for all the items purchased and dissipating a lot of time at the cashier. And it is becoming an increasing problem for the merchants to make their shoppers consigned and to anticipate 3 their demands because of the effect of contention and because of lack of equipment that isolate application designs. At some instances clients have issues with respect to the inadequate data about the item of discounts and thereby misuse of superfluous time at the counters. We can end this issue by supplanting the omnipresent Universal Product Code (UPC) standardized identification by keen names known as radio frequency identification (RFID) tag. To solve the given problems, we are implementing RFID based smart trolley in this field.
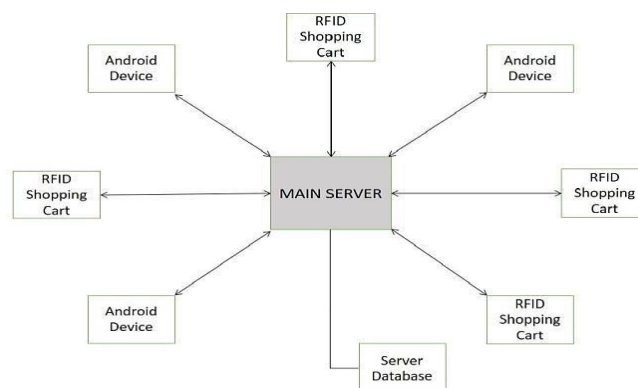
5.Proposed System

In the current system, bar codes are used for scanning the product details where the customers tend to wait in long queue for generating the bill

followed by payment. At times, the bar codes would have been damaged and that particular product cannot be scanned by a barcode scanner leading to confusion. Also, every product has to be scanned manually. In order to solve the problems previously identified and save customers time, money and help the retailers to win loyal clients, in this proposed system, each product will have a passive Radio Frequency ID tag which is bearing a unique Electronic Product Code. This Code gives all the data about the product i.e., its product name and respectively price. When the customer puts the product in the Smart Trolley, the Radio Frequency ID reader scans the tag and the Electronic Product Code number is generated. Radio Frequency ID reader passes the Electronic Product Code to the microcontroller. The name and price of the product obtained by the controller gets displayed on the LCD of the Smart Trolley, where client can see the item data. To store the item price and total billing data, microcontroller memory is used. LCD is interfaced with microcontroller in 4bit mode. It is used to indicate the purchaser, the action taken by the purchaser that is inserting of an item, removal of an item, item's price and total billing cost of items in the trolley. At the billing Counter, the total bill data will be transferred to PC through GSM/GPRS module. As per the test, when putting an item into the smart trolley or expelling an item from the cart, the smart trolley is able to precisely read it. One astonishing outcome is that the metal outside the cart obstructs the signal to a high degree that when the reader is inside the cart, no item outside the cart can be read. This clearly indicates that an item put into a smart trolley will not be perused by a nearby cart accidently. A RFID reader is installed at the checkout point so that the items in the cart can be meticulously read.

6.System Architecture

Each trolley is connected to the server system. Through Wifi communication, the trolley sends its information to automated central billing system, where the net price of all the purchased products is calculated and updates the data to the android device. Customer can get their billing information at the billing or packing section according to their trolley Identification Number. The RFID Anti-theft system is also connected to the server system. This anti-theft system is used to detect the thieves in the shopping mall.

7.Future Scope

The proposed Smart Shopping Trolley System intends to assist shopping in-person which will minimize the considerable amount of time spent in shopping as well as to time required in locating.

8. CONCLUSIONS

The Smart Trolley was designed to function as a system providing users the flexibility within the

retail store. It is designed to be highly efficient and fully synchronize with the retailer's current system.

2. A detailed market description and competitive analysis of the product market and its attributes were presented in this report. The target market identified was the big retailers; however consumers are the direct beneficiaries.

3. From the feedback responses obtained from both the Functional Assessment and Strategic Assessment phases, the Smart Trolley will gain a very good market.

In realistic, markets are these days utilized by a considerable amount of individuals in order for securing most of the items. Item procurement speaks to an unpredictable procedure that involves time spent in passageways, item area and checkout lines. Most of the time customer facing some issues and difficulty during purchasing. These problems comprise worrying about the money which they have brought would be insufficient for all the items purchased and dissipating a lot of time at the cashier. And it is becoming an increasing problem for the merchants to make their shoppers consigned and to anticipate 3 their demands because of the effect of contention and because of lack of equipment that isolate application designs. At some instances clients have issues with respect to the inadequate data about the item of discounts and thereby misuse of superfluous time at the counters. We can end this issue by supplanting the omnipresent Universal Product Code (UPC) standardized identification by keen names known as radio frequency identification (RFID) tag. To solve given problems, we implement the extensive notion of RFID based smart trolley in the field of retail stock.

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