

## Secure And Efficient User-friendly Mobile Based Shopping Cart System.

1. Dr. Rashmi Jain 2. Priyanka Kalekar 3. Roshani Charde 4. Prachiti Dethe 5. Kiran Bokde 6. Manisha More.

*Department of Computer Science and Engineering  
Rajiv Gandhi College of Engineering and Research Nagpur, Maharashtra, India.*

Submitted: 10-06-2021

Revised: 20-06-2021

Accepted: 23-06-2021

**ABSTRACT:** In this Proposed work developed such a shopping system that can be very helpful for the customer and that can also save the time of the customer and make their shopping easy. In this system customer scans the QR Code of the products and add product into the cart. Bill is a generated automatically which saves the time waiting in a queue. As a result customers don't have to hold up in long lines at checkout. This system brings new innovation than existing shopping system. The main purpose of this proposed work is to provide centralized and automated billing system using QR code. Along with the automatic billing some special features incorporated are budget setting and Product recommendation based on the special offers and discount along with product details with an anti – theft mechanism. We use new term that is Market Basket Analysis.

**KEYWORDS:** Cart, QR- CODE, Billing System, Security, Market Basket Analysis, Barcode, Smart shopping.

### I. INTRODUCTION:

Technology plays a very important role in the establishment of human nature and identity. Human beings are always demanding to develop technology which will support and fulfill their basic needs with an easier and faster way. At present, many super markets use the traditional shopping method, they buy the item, add into the cart and then goes to the billing counter. In billing counter, the scans, the barcode of items and make the bills. This shopping mode can make the customer tired and can waste much more time of the customer by waiting in the queue in the billing counter. So, to make the shopping easy for the customer we introduce the smart shopping cart system. In our project we develop such a shopping system that can be very helpful for the customer and that can also save the time of the customer and make their shopping easy. develop a smart

shopping cart system, in this system customer scans the QR Code of the items and add item into the cart. Also, bill is generated automatically which results saves the time required for waiting in a queue. In this project, we focus on a smart shopping cart.

Items entered in smart shopping carts can be read automatically and billing information can also be generated on smart carts. as a result, customers don't have to hold up in long lines at checkout Smart shelves that are also equipped with QR Code readers are capable to monitor all supplied things and send thing notices to the server. At the point when things or items wind up hawked out, the server can tell representatives to restock. It turns out to be simple for the store to prepare stock inventory management as all things can be naturally perused and effectively logged In this project consider security and privacy issues related to smart shopping systems as no previous research has tackled it. When a customer in the supermarket have to register first then and only then he/she can make shopping if previously register then they can login. The customer can be able to view their previous shopping in the screen and he she can proceed to their In our project we introduce a new concept which is market basket analysis for shopping. Thus, it helps in reducing product searching time Suppose for example if a customer can buy a milk, in a screen the product associated with the milk is to be shown such as bread and biscuits and the variety of these items will also be shown so that it will easy for the customer to find the items and it recommendshelves where that product is kept. If the new item is introduced in the store it will be shown in the advertisement section, so that the customer will knew that this new item is also available in that store . This project contributes to the advancement in the existing shopping system which can bring a new innovation in the field of shopping malls. The primary reason undertaking is to give incorporated and computerized charging

framework utilizing QR code. Along with the automatic billing some special features incorporated are budget setting and Product recommendation based on the special offers and discount along with product information.

#### MOTIVATION:

The real motivation behind the smart shopping cart system project is to make the shopping easy for the customer in the supermarket and can save the time of the customer waiting in the queue as the bill is already made in the customer's screen by individually scanning their product and add into their cart. We always see that in a big Shoppe the customer fond to be hard to find the products they need to ask for the helper or the owner of the Shoppe and also, they need hold up in the line in the billing counter. Sometimes might be finding products is easy than waiting in the billing queue because it consumes more time of the customer. So now by taking the motivation of this scenario which was regularly done in all the Shoppe we are designing this system which can be benefited for the customer in all the means and also it was benefited for the Shoppe owner also. So, we design a system by this, the customer can know their bill while adding the items in the cart. This system is benefited for the customer as they not exceed their monthly budget and our system can save the time of the customer in the billing counter too. It can make the shopping easy for the customer in the market.

- 1) We propose a complete design of the smart shopping system, and we give a description of the designs and corresponding functions in detail.
- 2) We are the first to propose using QR code technology to support connections in a smart shopping system. Our system is the first system to achieve automatic reading of the items with a proper range.
- 2) We are the first to design a secure protocol for the communications in the smart shopping system. To evaluate the protocol, we give a security analysis and performance evaluation in terms of computational complexity and communication complexity.
- 3) We have built a prototype of the smart shopping system and major functions, such as accurate and automatic reading, are achieved.

#### Introduction to WAMP Server

WAMP Server is a local server package for windows, allowing you to install and host web application that use Apache PHP and MySQL database. It also comes with PHP My Admin easily

manage database. It is an open source, free to use. The WAMP stack provide developer with the four-key element of web server. An operating system, WAMP Server is only package solution that will allow us to reproduce your production server. WAMP Server functionality are vary complete and easy to use with the left click on WAMP Server functionality are very complete and easy to use with the left click on WAMP Server icon we will be able to manage our Apache MySQL server.

Witch online/offline install and switch

- Witch online/offline install and switch apache, MySQL, PHP releases.
- Mange server setting access our setting les access logs.

#### Introduction to Dot Net

**NET** is a software framework which is designed and developed by Microsoft. The first version of .Net framework was 1.0 which came in the year 2002. In easy words, it is a virtual machine for compiling and executing programs written in different languages. It is used to develop Form-based applications, Web-based applications, and Web services. There is a variety of programming languages available on the .Net platform, VB.Net and C# being the most common ones are. It is used to build applications for Windows, phone, web etc. It provides a lot of functionalities and also supports industry standards. .NET Framework supports more than 60 programming languages in which Iprogramming languages are designed and developed by Microsoft. The remaining NonMicrosoft Languages which are supported by .NET Framework but not designed and developed by Microsoft.

Organization of rest of the chapters are as follows:

Chapter II describes the literature Review, Chapter III work done, Chapter IV describes the System modules and Designing, Chapter V describes the System analysis, Chapter VI describes the Result Analysis, Chapter VII describes about the Conclusion and Future Scope. VIII Referance

## II. LITERATURE REVIEW

In this section we will be describing about the various techniques that are used to implement "E CART SHOPPING SYSTEM" and the views of various authors about the existing system and its scope. The following are some literature review:

R. Li, et al. [1] proposed that RFID is a trend in the Internet of Things. They concentrate on a smart shopping system based on Radio Frequency Identification (RFID) technology. They use ultra-

high frequency (UHF) RFID tag and RFID reader. They use the RFID reader in the smart cart for the reading at the checkout point. UHF passive tags has longer range from 1 meter to 12 meters. The product that they sale are attached with an RFID tag, so that they can be tracked by any device equipped with an RFID reader in the store. Items which put into a “smart shopping cart” (with RFID reading capability). Items automatically read and the billing information generated on the smart cart. So, customers do not wait in long queues at counter. Smart shelves that are equipped with RFID readers are able to monitor all have available items and send item status updates to the server. However, for the store to do inventory management becomes easy as all items automatically read and easily logged.

Prof. P.C. Warule, et al. [2] proposed framework utilizes the RFID reader. RFID reader checks every one of the things as and when they are placed in the trolley. The record of the things purchased is put away in the small-scale controller memory alongside their individual expenses and additionally the aggregate consumption. This data is shown on an LCD screen which put on the trolley for the client to confirm the thing purchased and to keep a track on the sum spent on everything. At the charging side, the worker gets a separated bill from every single trolley just by giving the trolley number as the contribution to a product which at that point print the organized bill. Information can be eradicated from the smaller scale controller memory after the bill is printed in order to make that trolley reusable.

Akshay Kumar, et al. [3] it reduces the Queue at a billing kiosk in a shopping complex/Mall. The system displays the total price of the items set aside inside the cart , so the customer pays the amount at the billing counter and leave with the commodities he/she has bought. So, it removes the outdated scanning of products at the kiosk and in turn faster the speeds of shopping, so the customer well knows the total amount has to be paid and so his shopping focused only buying the essential needs results in greater savings. The system is based on the Arduino/raspberry pi platform and Xbee modules, as both are very common in smallscale research and wireless robotics solution. Hsin-Han Chiang, et al. [4] it proposed that smart shopping cart (SSC) that can be incorporated into the smart shopping mall system. Smart shopping cart (SSC) provides customers with the effective user interface as the result in shopping service can be effectively supported. In the system design, they add function of face recognition on the user crossing point, the

SSC recognize the customer provide shopping information based on Ankush Yewatkar, et al. [5] they calculate how many products sold and it generate the bill for the customer. When customer go to shop for shopping, client has selected the right product. after that hat, it is riotous to remain in line for charging every one of the merchandises this build up a savvy shopping basket framework that monitor bought items and furthermore online exchange for charging utilizing RFID and ZigBee. The framework gives recommendations for items to purchase dependent on client buy history from a brought together framework. In this framework, each thing in Mart has RFID tag, and each truck has RFID Reader and ZigBee joined to it. There centralized system for the reference and online operation. RFID reader at the exit door for anti-theft. . P. Chandrasekar, et al. [6] proposed framework gives concentrated and robotized charging framework utilizing RFID and ZigBee correspondence. Each product of supermarket, supermarkets provided with a RFID tag, to identify its type. Each shopping basket is outlined or executed with a Product Identification Device (PID) that contains microcontroller, LCD, a RFID reader, EEPROM, and ZIGBEE module. Obtaining product data is perused a RFID reader on shopping basket, meanwhile product data will be put away into EEPROM appended to it and EEPROM information is send to Central Billing System through ZigBee module. Focal charging framework gets the truck data and EEPROM information, it gets to the item database and computes the aggregate sum of obtaining for that specific truck. This application makes a computerized focal bill framework for markets and shopping center. Utilizing PID, clients no need to wait near cash counters for their bill payment. Their purchased product information is transferred to central billing system. Customers can pay their bill using credit/debit cards. The 8- microcontroller used. It has the capability of receiving 8-bit data from RFID reader. Sara Amendola, et al. [7] they proposed RFID innovation for IoT Healthcare and the individual experience of the creators recount an account of blended chances and fracture. Overall college labs are presently examining and making models of RFID sensors, both aloof and semi-dynamic that can be questioned from a separation perfect with the cooperation with a system foundation. There are just couple of items are monetarily accessible for huge scale application A much-focused effort is, therefore, needed to manage the conversion from experiments to the real use and mass production within a so potentially fastgrowing market. The defeating of

the moderating elements requests an organized movement of the IoT people group to fortify enthusiasm for potential last clients and, in parallel, to help the development of per users, programming, and gadgets toward a more interconnected perspective.

- R. Kumar, et al. [8] they introduced intelligent cart system. In that customer management module allows the administrator to maintain record of registered customers. The proposed system sends advertisement or offers to the user as per need. Product Management features allows administrator to track inventory, maintain product availability, product sales and purchase etc. From client's point of view and additionally Malls Manager Perspective, it is valuable framework that when client visit shopping center, he essentially filters
- S. Gupta, et al. [9] they build an automated and time saving system for the world of retail which made shopping experience impulsive, customer friendly and protected. Smart cart that capable of generating a bill from the cart itself. The customer makes the payment in no time through a rechargeable credit card. This help for maintaining of database. The outlined cart disposes of the exertion of self-bundling, makes the best utilization of truck storage room and includes security system for burglary control. The savvy truck utilizes RFID innovation for shopping and installment, AVR microcontroller for fringe interfacing and stock administration. This innovative system help stores to see a rise in their sales along with delighting customers. This innovative system help stores to see a rise in their sales along with delighting customers.
- R. Khan, et al. [10] he proposed work deals with the web of things (IoT) which has turned into a promising and energetic innovation to fabricate control full brilliant frameworks to screen and examine different ongoing working frameworks. The proposed work examines the experiences into the four building squares of IoT (Things, Gateways, Network foundation, and Cloud framework), three principle segments of IoT (The Things with Networked Sensors and Actuators, Raw Information and Processed Data Stores, and Analytical and Computing Engines) alongside design layers (Three Layer, Five Layer, Six Layer, Seven Layer, Cloud, and FOG). The principle commitment is that it outlines the IoT, IoT building squares, segments and their co-operation alongside engineering layers methodically. Mohit Kumar, et al. [11] This

product is basically an embedded system that uses arm7 lpc2148 microcontroller. The motive of smart and quick billing is achieved by interfacing RFID and ZIGBEE module with the microcontroller. Janhavi Iyer, et al. [12] The advent of wireless technology along with other communication techniques has helped in making electronic commerce very popular. A modern futuristic product is the one that aids the comfort, convenience and efficiency in everyday life. In this project, we discuss an innovative concept of RFID Based Smart Shopping and Billing System. The main goal is to provide a technology oriented, lowcost, easily scalable, and rugged system for aiding shopping in person.

Anjali Verma, et al. [13] The proposed research evaluates various strategies to assist shopping for a consumer to minimize the shopping time in the mall at the same time provides equal opportunity to aid the store management by providing real-time updates on the inventory. Galande Jayshree, et al. [14] Our aim is to develop a system that can be used in shopping malls. The system will be placed in all the trolleys. It will consist of a RFID reader. All the products in the mall will be equipped with RFID tags. When a person puts any products in the trolley, its code will be detected and the price of those products will be stored in memory. As we put the products, the costs will get added to total bill. Thus, the billing will be done in the trolley itself. Item name and its cost will be displayed on LCD. Also, the products name and its cost can be announced using headset. At the billing Counter the total bill data will be transferred to PC by wireless RF modules.

#### **Problem Definition**

To develop a smart shopping cart system that assists the customer to locate and select products and inform them on the products details in the shopping arena. Additionally, with each product identified uniquely and support billing and inventory updates. We develop smart shopping system for the customer that assist the customer to locate the shelves where the product. In addition, we are attaching the QR Code to the shelves by scanning QR Code list of product and quantity of product available in shelves is shown thus to reduce the queue of customers at billing counter by atomicity of smart shopping system. by using the concept of market basket analysis we can solve the problems of the customers to find the items related to that product. The best and most useful example of this market basket analysis is that if a customer purchases bread then he will also purchase the related items that is wither butter using these



concepts we can make customer to purchase the related products. customers gets the message on his cell phone for successful payment of bill. Thus, the problem for searching for the product is thus solved and thus allows customers to do shopping or make payment without waiting in the queue

### III. WORK DONE

In this project develop such a shopping system that can be very helpful for the customer and that can also save the time of the customer and make their shopping easy. We develop a smart shopping cart system .

The methodology of project is consist of four modules .

#### I Android Application II Shopping Panel .

#### III Admin Panel,

#### III WORK DONE

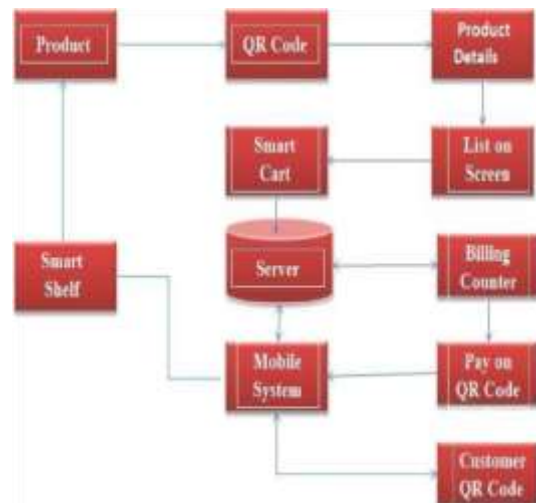
In this project develop such a shopping system that can be very helpful for the customer and that can also save the time of the customer and make their shopping easy. We develop a smart shopping cart system .

The methodology of project is consist of four modules .

#### I Android Application II Shopping Panel . III Admin Panel, IV Billing Counter.

If the customer enter into shopping mall and want to shopping for shopping customer should have the QR Code as a login ID. The QR code is generated on Android application for this customer have to register their self by filling registration form on android application. The QR code is generated by using a QR code generator algorithm. The QR code is save on android application which is use for shopping any time. After the login is successful the customer is able to view their previous shopping details. After the registration process is done the customer have to scan the generated QR code on shopping cart. Then and only then the login process on cart is done for this we mounted a monitor on cart and a camera for scanning purpose.

After the login process customer search for the products that



### III.I PROPOSED ARCHITECTURE

Admin Login After registering the admin is allowed to log in. He or she can now view the admin homepage where there are options to take previous shopping, QR code, Shopping Bill. One by one chose QR code for Scan it and login . next page is show product list which gives full information with QR code. For a different register number a different ID is to be generated. The generated ID is store in the QR Code, which is used by the customerin the shopping panel as well as the in thebillingcounter.

Customer can login directly just simply scanning their QR code on camera which is mounted on cart. After scanning the QR Code, the customer is all ready for Shopping panel is open for shopping for continue process customer have to start camera. Other options are giver such as view history, product list, etc.

This implemented the new concept which is Market Basket analysis. It is nothing but a recommendation of product. product, product cost is automatically added to bill and the recommended product is shown. We create the price along with its GST (Goods Service Tax). We implemented the new For this we created a category of product according to category the product get recommended. Suppose customer buy a product which is belong to category of oil, then he can get all product list which is belong to oil category. Apart from this customer can set up their budget as price is display on screen he/she can add or deduct any product.

### III . I.I PROPOSED WORK

#### Customer Application Module

Customer application module is an android application consist of registration and login where Customer have to register to the registration

page and login. Which will generate a particular QR code to specific Customer. Customer can login and check the products or items using this android application. Notification of new product are shown on the screen. User or Customer can use this application anywhere to get knowledge about the product available in the super shop.

#### **QR Generation and Scanner Module**

Products get scanned to extract information about quality, expiry date and price. After getting to trolley, the screen will display total amount through QR code which will turn out in bill

#### **Kiosk Module**

This module is responsible to display information on the LCD screen. It works like ATM machine

#### **Random Number Generation System**

It is one of the system which is responsible when will add products into the cart. After adding products into the cart, it will automatically calculate the bill.

#### **API Integration Module**

After scanning customer's QR code for billing API Integration system is responsible to send bill to customer by SMS gateway.

### **III.I.III ALGORITHM**

#### **1. QR Code Generation Algorithm:**

The process (and high-level algorithm) for generating a QR Code symbol is as follows:

1. Choose the text or binary data to encode.
2. Choose one of the 4 error correction levels. A higher ECC level will yield a barcode that tolerates more damaged parts while preserving the payload data, but will tend to increase the version number.
3. Encode the text into a sequence of zero or more segments. A segment in byte mode can encode any data, but using alphanumeric or numeric mode is more compact if the text falls into these subsets.
4. Choose the text or binary data to encode.
5. Choose one of the 4 error correction levels. A higher ECC level will yield a barcode that tolerates more damaged parts while preserving the payload data, but will tend to increase the version number.
6. Encode the text into a sequence of zero or more segments. A segment in byte mode can encode any data, but using alphanumeric or numeric mode is more compact if the text falls into these subsets.

7. Based on the segments to be encoded and the ECL, choose a suitable QR Code version to contain the data, preferably the smallest one.
8. Concatenate the segments and add a terminator. The result is a sequence of bits.
9. Add padding bits and bytes to fill the remaining data space.
10. Choose the text or binary data to encode.
11. Choose one of the 4 error correction levels. A higher ECC level will yield a barcode that tolerates more damaged parts while preserving the payload data, but will tend to increase the version number.
12. Encode the text into a sequence of zero or more segments. A segment in byte mode can encode any data, but using alphanumeric or numeric mode is more compact if the text falls into these subsets.
13. Based on the segments to be encoded and the ECL, choose a suitable QR Code version to contain the data, preferably the smallest one.
14. Concatenate the segments and add a terminator. The result is a sequence of bits.
15. Add padding bits and bytes to fill the remaining data space.
16. Based on the segments to be encoded and the ECL, choose a suitable QR Code version to contain the data, preferably the smallest one.
17. Concatenate the segments and add a terminator. The result is a sequence of bits.
18. Add padding bits and bytes to fill the remaining data space.
19. Reinterpret the bit stream as a sequence of bytes, then divide it into blocks. Compute and append error correction bytes to each block. Interleave bytes from each block to form the final sequence of 8-bit code words to be drawn.
20. Initialize a blank square grid based on the version number.

Draw the function patterns (finders, alignment, timing, version info, etc.) onto the appropriate modules. This is formatting overhead to support the QR Code standard, and does not encode any user data. Draw the sequence of (data + error correction) code words onto the QR Code symbol, starting from the bottom right. Two columns at a time are used, and the scanning process zigzags going upward and downward. Any module that was drawn for a function pattern is skipped over in this step.



Fig. III.I.III QR CODE

Either manually or automatically choose a mask pattern to apply to the data modules. If masking automatically, then all 8 possibilities are tested and the one with the lowest penalty score is accepted. Note that the format information is redrawn to reflect the mask chosen. The first thing is Admin has to enter the category of product. Product are stored according to category and subcategory of respective product. Then admin can enter the product along with the

### III I. IV K-Mean Algorithm

The k-means algorithm (MacQueen, 1967; Anderberg, 1973), one of the mostly used clustering algorithms, is classified as a partitional or nonhierarchical clustering method (Jain and Dubes, 1988). Given a set of numeric objects  $X$  and an integer number  $k$  ( $\leq n$ ), the k-means algorithm searches for a partition of  $X$  into  $k$  clusters that minimizes the within groups

$$\text{Minimise } P(W, Q) = \sum_{i=1}^k \sum_{j=1}^n w_{ij} d(X_i, Q_j) \quad (1)$$

$$\text{subject to } \sum_{j=1}^k w_{ij} = 1, 1 \leq i \leq n$$

$$w_{ij} \in \{0,1\}, 1 \leq i \leq n, 1 \leq j \leq k \quad (2)$$

(WGSS). This process is often formulated as the following mathematical program problem  $P$  (Selim and Ismail, 1984; Bobrowski and Bezdek, 1991): where  $W$  is an  $n \times k$  partition matrix,  $Q = \{Q_1, Q_2, \dots, Q_k\}$  is a set of objects in the same object domain, and  $d(\cdot, \cdot)$  is the squared Euclidean distance between two objects. Problem  $P$  can be generalized to allow  $(w_{i,l})^\alpha$  where  $w_{i,l} \in [0,1], \alpha \geq$

1 (Bobrowski and Bezdek, 1991). The generalized form is referred to as fuzzy clustering (Ruspini, 1969, 1973), which is not considered in this paper. Problem  $P$  can be solved by iteratively solving the following two problems:

1. Problem P1: Fix  $Q = Q^*$  and solve the reduced problem  $P$ .
2. Problem P2: Fix  $W = W^*$  and solve the reduced problem  $P(W, Q)$ .
3. Problem P1 is solved by  $w_{i,l} = 1$  if  $d(X_i, Q_l) \leq d(X_i, Q_t)$ , for  $1 \leq t \leq k$
4.  $w_{i,t} = 0$  for  $t \neq l$  and problem P2 is solved by

$$P_{i,l} = \frac{w_{i,l} |x_i - q_l|^2}{\sum_{j=1}^k w_{i,j} |x_i - q_j|^2}$$

for  $1 \leq l \leq k$ , and  $1 \leq j \leq m$ . The basic algorithm to solve problem  $P$  is given as follows (Selim and Ismail, 1984; Bobrowski and Bezdek, 1991):

1. Choose an initial  $Q_0$  and solve  $P(W, Q_0)$  to obtain  $W_0$ . Set  $t = 0$ .
2. Let  $W_t$  and solve  $P(W_t, Q)$  to obtain  $Q_{t+1}$ . If  $P(W_t, Q_t) = P(W_t, Q_{t+1})$ , output  $t$  and stop;

1. Let  $Q^* = Q^{t+1}$  and solve  $P(W, Q^*)$  to obtain  $W_{t+1}$ . If  $P(W_t, Q^*) = P(W_{t+1}, Q^*)$ , output  $W_t, Q$  and stop; otherwise, let  $t = t + 1$  and go Because  $P(\cdot, \cdot)$  is non-convex and the sequence  $P(\cdot, \cdot)$  generated by the algorithm is strictly

2327-4662 (c) 2016 IEEE. Personal use is permitted, but republication/redistribution requires IEEE permission. See [http://www.ieee.org/publications\\_standards/publications/rights/index.html](http://www.ieee.org/publications_standards/publications/rights/index.html) for more information.

Things Journal decreasing, after a finite number of iterations the algorithm converges to a local minimum point (Selim and Ismail, 1984). The computational cost of the algorithms  $O(Tkn)$  where  $T$  is the number of iterations and  $n$  the number of objects in the input data set. The k-means algorithm has the following important properties:

1. It is efficient in processing large data sets.
2. It often terminates at a local optimum (MacQueen, 1967; Selim and Ismail, 1984).
3. It works only on numeric values. If the customer enter into shopping mall and want to shopping

## IV. MODULES

### I Admin Panel

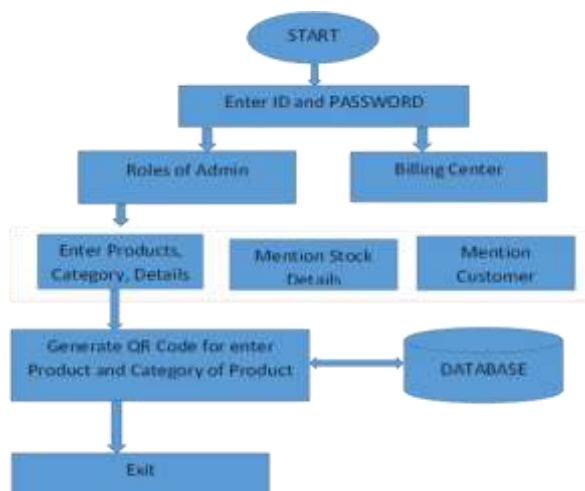


Figure IV .I: Data Flow Diagram of Admin Panel

The admin has the various powers of decisions this are explain as follows, the admin has to enter the ID and password which is provide for primary security purpose.

Admin can handle both the Billing counter as well as a data mart of his/her shopping mall. There are various authority or roles are given to admin.

The first thing is Admin has to enter the category of product. Product are stored according to category and subcategory of respective product. Then admin can enter the product along with the detail, price,

4662 (total number of products, also we implement the price along with GST (Goods Service Tax). The percentage of goods have to enter in database, while calculating product total cost the automatic calculation is done along with GST percentages. Admin has an authority to

mention the stock detail, along with that the customer details are also mention in data base. The QR code generated for different product as well as for category the overall details are store in database. Admin can generate the QR code for product which is done by using a QR code generation algorithm which we used in this project. We use the Net frame work for developing the Admin Panel, various. WAMP Server and SQLare used for data base crating and maintenance.

### IV .II CUSTOMER PANEL

In this module design the Customer Panel by considering the basic requirement of customer what they want, and what we can do. We design the project to reduce the time of customers.



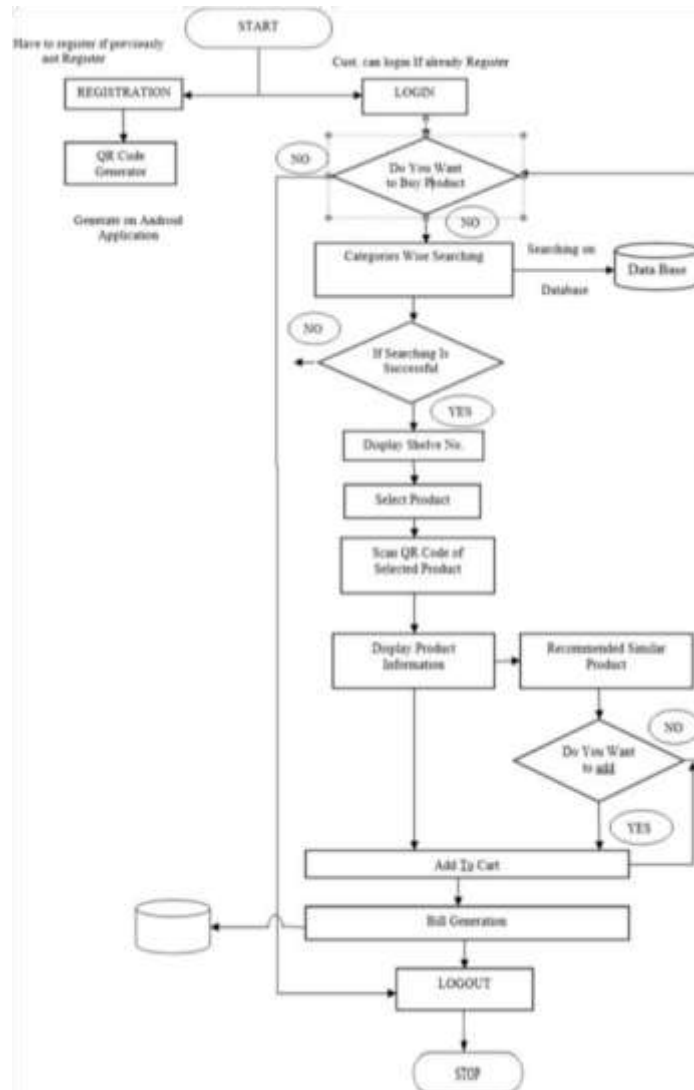


Figure IV .II: Data Flow Diagram of Customer Panel

Which hides the customer detail?

The customer can able login on cart where we mounted a monitor or a screen and a web camera for scanning purpose. Now customer select the product and scan it on cart monitor, scanned product gets added to generated bill shown on monitor which is useful for customer for budget setup. Product recommendation is a term we introduce in this which is based on market basket analysis.

For example, if customer select the product milk it shows the dairy category products like butter, curd etc. The market basket analysis is a

concept in which the one can able to see the list of items related to that item. We introduce the market basket analysis term to recommend the product based on the category of the product. Due to this the customer can be able to see the new product introduce in the shop or the new product available in the shop.

Now after the shopping of the customer is completed the customer can goes to the billing counter for paying the bill. The generated bill is transfer to billing counters using a gateway after compilation of this customer have to rescan their QR code on billing counter which is used

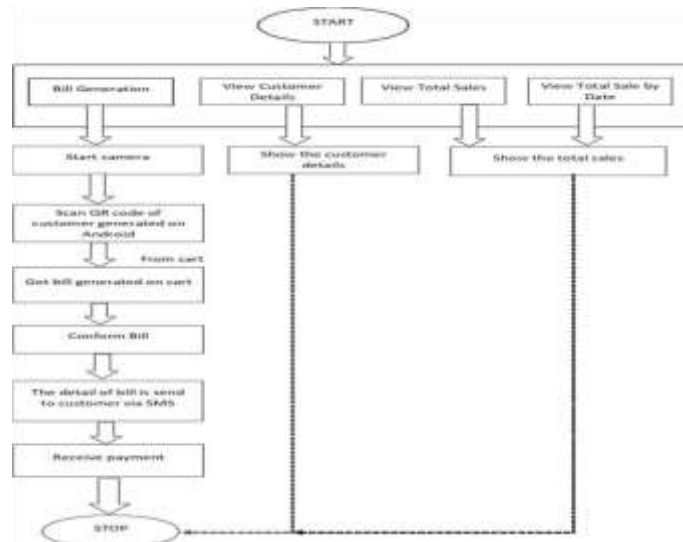


Figure IV .II: Data Flow Diagram of Customer Panel

Firstly, the customer has to register their self by using Android application, for that we develop an Android application as a customer ID we gave the QR code for identification of for identification of the customer.

#### IV .III Billing Counter

In billing counter Admin can able to operate four operation this are mention on flow chart. Admin can able to view the details of customer as well as product details. Customer scan their QR code on billing counter after scanning the bill is transfer to billing counter on clicking conform bill after payment the conformation SMS(Short Message Service) is send to billing counter.

### V. SYSTEM ANALYSIS

Various requirements of customer are explain in this section what customer actually wants what are their needs this are mention. Customer wants the shopping system which is user friendly. The as we needs the digital works which reduces the time we spend on shopping. Customer also wants the details of new product along with price. Some customer wants the product along with GST percentages. Recommendation is the term we introduces which helps customer for shopping as somecustomer needs recommendation for their shopping. Quick bill generation which is more demanding and usefulas noneed to spend extra time for wetting in queue. For billing purpose. We try to fulfill this requirements of customer and develop the shopping system which is useful for every

#### V .I. System Requirement

Operating System information: DOI 10.1109/JIOT.2017.2706698, IEEE Internet of Things Journal

- Window Operating System 10: This Operating System is the latest Operating System. It Is the convenient OS as compared to other OS's.

Language

- Cart Framework: .Net
- Other: PHP, SQL
- Backend Database: WAMP server

#### Software Used

- Android Studio: Android Studio provides a unified environment where you can build apps for Android phones, tablets, Android Wear, Android TV, and Android Auto. Structured code modules allow you to divide your project into units of functionality that you can independently build, test, and debug.

#### Hardware Requirement

- Android mobile phone
- Intel core processor
- Webcam
- Shopping Cart
- Laptop as cart monitor

### VI. RESULTS AND DISCUSSIONS

This Chapter explains the modules of our project application. These are divided into four sections which are Android application, Shopping Panel, Admin Panel, Billing Counter. All modules

with their respective screenshot will be shown below with their detailed explanation

#### 1 MODULES

The First module explains about the Android Application. If the customer enter into the shopping mall and want to shopping customer should have the QR Code as a Login ID. The QR Code is generated on Android Application for this Customer first customer have to register their self by filling registration form on android application. For regular customer have to login option to login your account as for the new customer first complete the registration phase by filling the customer identification data i.e. First Name, Middle Name, Surname, Mobile number, Gender, Address, etc. for login if already registered they can login directly. QR Code is generated for customer as a customer ID, customer have to scan this QR code on cart monitor. After that customer can proceed for further process. The QR code is generated using a QR code generator algorithm. The QR code generated is stored in Android Application there is no need for QR code generation again and again. The generated QR code is 4662 (c) 2016 IEEE. Personal use is permitted, but republication/redistribution requires IEEE permission. See This article has been accepted for publication in a future issue of this journal, but has not been fully edited. Content may change prior to final publication. Citation information: DOI 10.1109/JIOT.2017.2706698, IEEE Internet of used at cart monitor as well as at billing counter.

For particular customer there is one QR code which act as a customer ID. Customer able to view their previous shopping detail and Shopping Bill's, QR code is store in QR code option hence there is no need of generating QR code again and again. For a different register number a different ID is to be generated. The generated ID is store in the QR Code, which is used by the customer in the shopping panel (shopping cart) as well as the in the billing 4662 (c) 2016 IEEE. Personal use is permitted, but republication/redistribution requires IEEE permission. See This article has been accepted for publication in a future issue of this journal, but has not been fully edited. Content may change prior to final publication. Citation information: DOI 10.1109/JIOT.2017.2706698, IEEE Internet of

This article has been accepted for publication in a future issue of this journal, but has not been fully edited. Content may change prior to final publication. Citation information: DOI 10.1109/JIOT.2017.2706698, IEEE Internet of used at cart monitor as well as at billing counter. For particular customer there is one QR code which act as a customer ID. Customer able to view their previous shopping detail and Shopping Bill's, QR code is store in QR code option hence there is no need of generating QR code again and again. For a different register number a different ID is to be generated. The generated ID is store in the QR Code, which is used by the customer in the shopping panel (shopping cart) as well as the in the billing

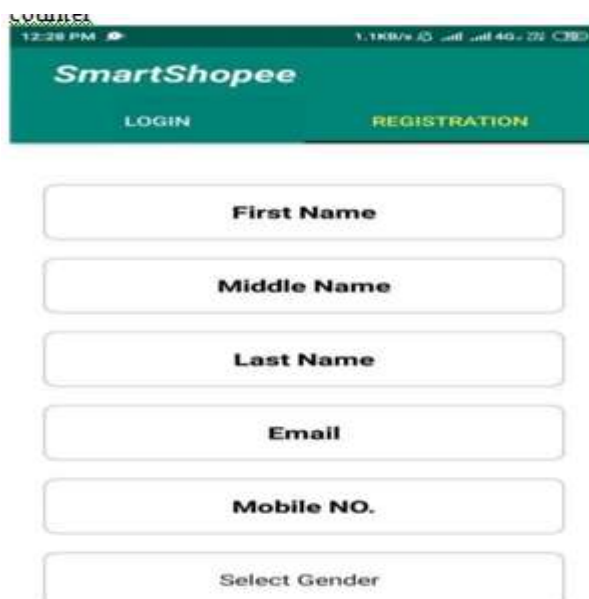
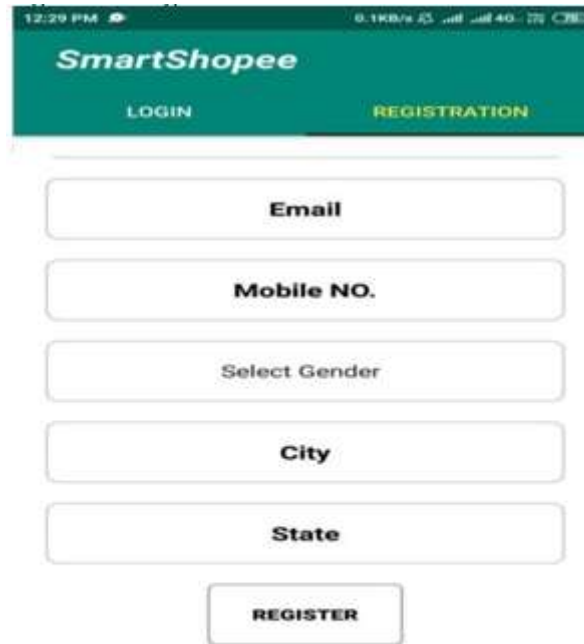


Fig VI.I Registration

A screenshot of the SmartShopee mobile application registration page. The header is green with the 'SmartShopee' logo and 'LOGIN' and 'REGISTRATION' options. The registration form consists of five input fields: 'Email', 'Mobile NO.', 'Select Gender', 'City', and 'State', followed by a 'REGISTER' button.

12:29 PM 0.1KB/s 4G CB

**SmartShopee**

LOGIN REGISTRATION

Email

Mobile NO.

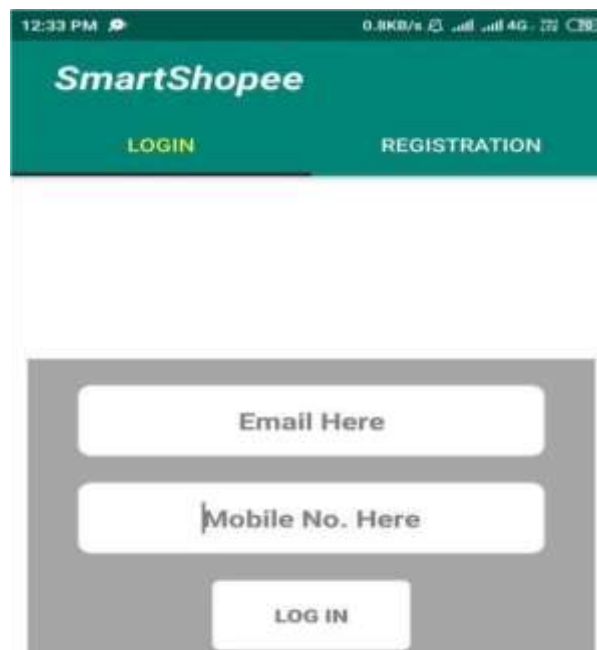
Select Gender

City

State

REGISTER

Fig VI.I Registration

A screenshot of the SmartShopee mobile application login page. The header is green with the 'SmartShopee' logo and 'LOGIN' and 'REGISTRATION' options. The login form is highlighted with a grey background and contains two input fields: 'Email Here' and 'Mobile No. Here', followed by a 'LOG IN' button.

12:33 PM 0.8KB/s 4G CB

**SmartShopee**

LOGIN REGISTRATION

Email Here

Mobile No. Here

LOG IN

Fig VI.II Login Page



Fig VI.III QR Code Generation

For particular customer there is one QR code which act as a customer ID Customer able to view their previous shopping detail and Shopping Bill's, QR code is store in QR code option hence there is no need of generating QR code again and

again. For a different register number a different ID is to be generated. The generated ID is store in the QR Code, which is used by the customer in the shopping panel as well as the in the billing counter.



Fig : Next step after login

The next module updates about shopping panel. Customer can login directly just simply scanning their QR code on camera which is mounted on cart.





Fig : VI.V Scanning QR Code by scanner mounted on Shopping Cart 4662 (c) 2016 IEEE. Personal use is permitted, but republication/redistribution requires IEEE permission.

After scanning the QR Code, the customer is all ready for shopping. Shopping panel is open for shopping for continue process customer have to start camera. Other options are given such as view history, product list, etc. shows the shopping process. After scanning the QR code of product, product cost is automatically added to bill and the recommended product is shown. Displays the product details, if any customer doesn't know about any product then they are able to check from the given option and this is useful for customer to

be display on the product list total list of the product available in the Shopping mall is Here the total list of product in the shop will be shown here. shows the list of previous shopping or we can say that history of shopping. If customer wants to buy a product from their last shopping list then they are able to view and select the products from their last shopping list. After receiving SMS the customer need to pay the bill through the cash. Now customer's shopping completed successfully and they are able to log out from the shopping mall.



Fig Last Shopping List

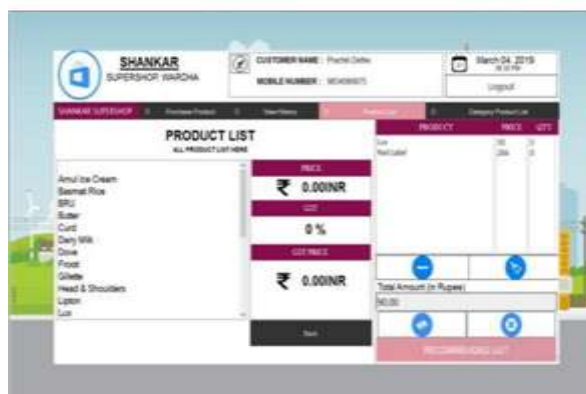


Fig VI.VI Shopping Panel



Fig 4.8 Shopping Process

Personal use is permitted, but republication/redistribution requires IEEE permission.



Fig 4.9 Product Details

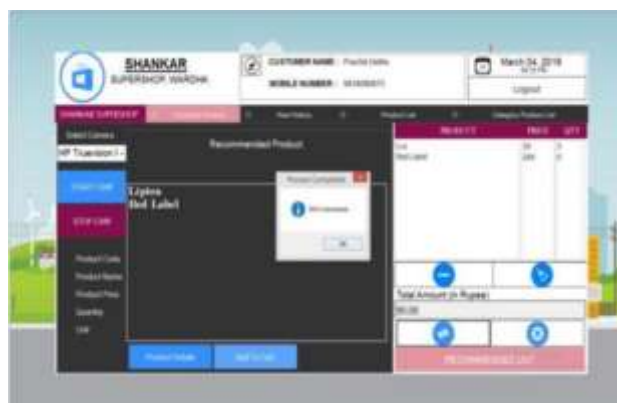


Fig 4.10 Display Product List

The Screenshot 5.9 shows the list of previous shopping or we can say that history of our shopping. If customer wants to buy a product from their last shopping list then they are able to view and select the products from their last shopping list.



Fig 4.11 Display Last Shopping List

explain as follows, the admin has to enter the ID and password which is provide for primary security purpose. Admin can handle both the Billing counter as well as a data mart of his/her shopping mall. There are various authority or roles are given to admin

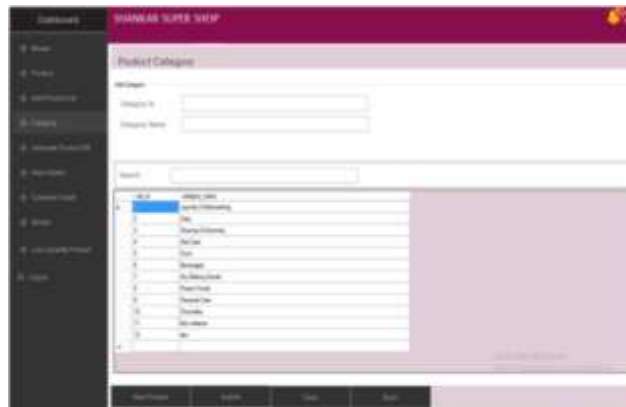


Fig 4.12 Product Category

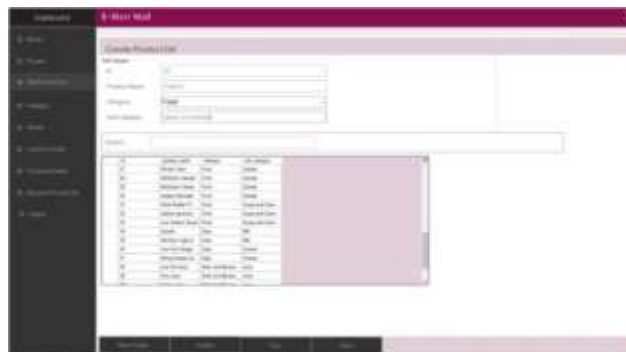


Fig 4.13- Product List



Different product has to fill in the product list and the category need to be select from the dropdown list and the sub-category related to that product need to be enter and after filling submit the data. The QR code generated for different product as well as for category the overall details are store in database. Admin can generate the QR code for product which is done by using a QR code generation algorithm which we used

in this project. We use the Net frame work for developing the Admin Panel, various. WAMP Server and SQL are used for data base crating and maintenance. Admin can maintain different stocks details of their shopping mall by clicking on “Stock” option. Stock maintenance is nothing but the product Screenshot - Product QR Image available in the shopping mall



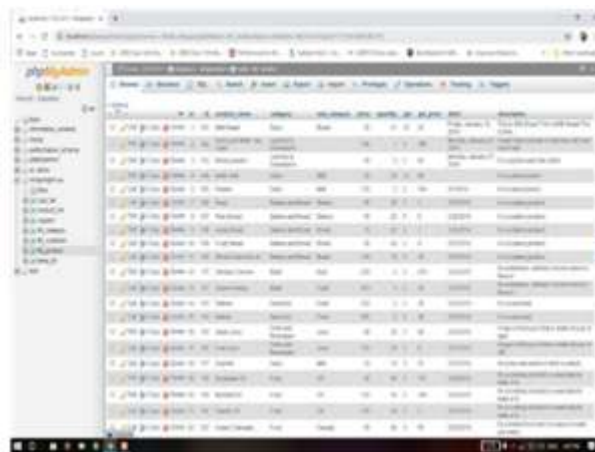
Screenshot - Database of Registration Phase

Screenshot -Stocks Details

Admin can able to maintain the details of purchased product by clicking on “Purchase details option



**Screenshot - Purchase Details** Admin can generate QR code for product as well as for category by selecting category of product name  
**Screenshot- Database of Product list** which is filled in the database,



**Screenshot SMS Receive by Customer**

### Future Scope

The keen shopping basket framework is uncommonly purposed for the client who went for shopping in the market for their everyday needs. Later on we make the task in the productive way, in spite of the fact that we have put our earnest attempts to make the product adaptable, simple to work yet constraint can't be discounted by us although the product offers a wide scope of choices to its clients.

Because of calculated and somewhat because of absence of unpredictability.

We make include the offices of representative pay

**Screenshot - Database of Product** exchange framework.

Here we compare our Proposed System with Existing System. Credit Card charging framework is likewise executed in future.



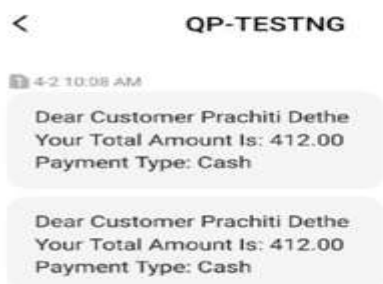
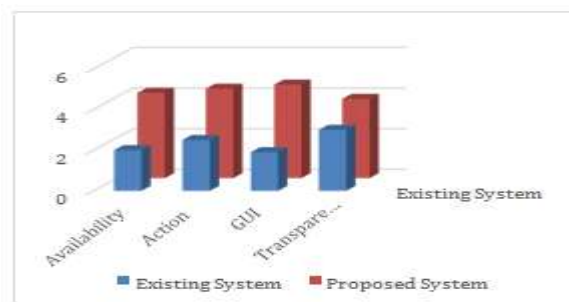


Fig: Screenshot SMS Receive by Customer

## VII. CONCLUSION AND FUTURE SCOPE

In this undertaking to grow such a framework utilizing which things put into a shopping crate can peruse QR Code utilizing camera and complete posting of things and information demonstrate the on the keen cart.. All can screen the loaded things and send thing notices to the server. Right when things end up sold out, the server can educate laborers to restock. Smart cart produces programmed bill going on the shopping basket in this way the client knows precisely how much sum needs to pay. It gives quicker administration at the checkouts this in the favorable position for shop proprietors is that they will require less clerks, which will result in a colossal decrease in their expense. E cart shopping framework which enables client to pre decided spending plan and just purchases the fundamental wares really required by him, additionally the framework helps. It focuses on a smart shopping system based on gateway Technology which thus helps in automatically generating bill to bill counter. In such a system, all items for sale consists of QR Code so that they can likewise be utilized to scan the particular product on shelves. The keen shopping basket framework is uncommonly. system that is the availability, action, GUI, Transparency. The Existing system represent in blue color whereas Proposed System is represent in orange color. The proposed system of our project is more than the existing one, similarly action, GUI

and transparency of our proposed system is also very reliable than the existing one.

GUI of Proposed System is friendly as some notation are given, Registration phase is easy and complete within short span of time as compare to existing one. We consider some security issues that's why we are given a SMS service for billing proof at customer side which is not given in existing system. This is nothing but a term transparency.

## ACKNOWLEDGMENT

### REFERENCE

- [1]. F. Xia, L. T. Yang, L. Wang, and A. Vinel, "Internet of things," *International Journal of Communication Systems*, vol. 25, no. 9, p. 1101, 2012.
- [2]. 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. [
- [3]. N. Mitton, S. Papavassiliou, A. Puliafito, and K. S. Trivedi, "Combining cloud and sensors in a smart city environment," *EURASIP journal on Wireless Communications and Networking*, vol. 2012, no. 1, p. 1, 2012.
- [4]. T. Song, R. Li, X. Xing, J. Yu, and X. Cheng, "A privacy preserving communication protocol for iot applications in smart homes," in to appear in

- International Conference on Identification, Information and Knowledge in the Internet of Things (IIKI) 2016, 2016.
- [5]. S. Shepard, RFID: radio frequency identification. McGraw Hill Professional, 2005.
- [6]. D. M. Dobkin, The rf in RFID: uhf RFID in practice. Newnes, 2012.
- [7]. D. Klabjan and J. Pei, "In-store one-to-one marketing," *Journal of Retailing and Consumer Services*, vol. 18, no. 1, pp. 64–73, 2011.
- [8]. T. Shanmugapriyan, "Smart cart to recognize objects based on user intention," *International Journal of Advanced Research in Computer and Communication Engineering*, vol. 2, no. 5, 2013.
- [9]. R. Kumar, K. Gopalakrishna, and K. Ramesha, "Intelligent shopping cart," *International Journal of Engineering Science and Innovative Technology*, vol. 2, no. 4, pp. 499–507, 2013.
- [10]. S. Gupta, A. Kaur, A. Garg, A. Verma, A. Bansal, and A. Singh, "Arduino based smart cart," *International Journal of Advanced Research in Computer Engineering & Technology*, vol. 2, no. 12, 2013.
- [11]. Z. Ali and R. Sonkusare, "Rfid based smart shopping and billing," *International Journal of Advanced Research in Computer and Communication Engineering*, vol. 2, no. 12, pp. 4696–4699, 2013.
- [12]. P. Chandrasekar and T. Sangeetha, "Smart shopping cart with automatic billing system through rfid and zigbee," in *Information Communication and Embedded Systems (ICICES), 2014 International Conference on*. IEEE, 2014, pp. 1–4.
- [13]. M. R. Sawant, K. Krishnan, S. Bhokre, and P. Bhosale, "The rfid based smart shopping cart," *International Journal of Engineering Research and General Science*, vol. 3, no. 2, pp. 275–280, 2015. A. Yewatkar, F. Inamdar, R. Singh, A. Bandal et al., "Smart cart with automatic billing, product information, product recommendation using rfid & zigbee with anti-theft," *Procedia Computer Science*, vol. 79, pp. 793–800, 2016.
- [14]. [14]Z. Cai, Z. He, X. Guan, and Y. Li, "Collective datasanitization for preventing sensitive information inference attacks in social networks," *IEEE Transactions on Dependable and Secure Computing*, 2016.
- [15]. Z. He, Z. Cai, Q. Han, W. Tong, L. Sun, and Y. Li, "An energy efficient privacy-preserving content sharing scheme in mobile social networks," *Personal and Ubiquitous Computing*, vol. 20, no. 5, pp. 833 – 846, 2016.
- [16]. L. Zhang, Z. Cai, and X. Wang, "Fakemask: A novel privacy preserving approach for smartphones," *IEEE Transactions on Network and Service Management*, vol. 13, no. 2, pp. 335–348, 2016.
- [17]. Y. Wang, Z. Cai, G. Yin, Y. Gao, X. Tong, and G.
- [18]. Wu, "An incentive mechanism with privacy protection in mobile crowdsourcing systems," *Computer Networks*, vol. 102, pp. 157–171, 2016.
- [19]. X. Jin, M. Zhang, N. Zhang, and G. Das, "Versatile publishing for privacy preservation," in *Proceedings of the 16th ACM SIGKDD international conference on Knowledge discovery and data mining*. ACM, 2010, pp. 353–362.
- [20]. C. Hu, R. Li, W. Li, J. Yu, Z. Tian, and R. Bie, *International Conference on Management of data*. ACM, 2009, pp. 153–164.
- [21]. M. Larson, R. Li, C. Hu, W. Li, X. Cheng, and R. Bie, "A bidder-oriented privacy-preserving vcg auction scheme," in *International Conference on Wireless Algorithms, Systems, and Applications*. Springer, 2015, pp. 284–294.
- [22]. N. Zhang and W. Zhao, "Privacy-preserving data mining systems," *Computer*, vol. 40, no. 4, pp. 52–58, 2007.
- [23]. W. Li, M. Larson, C. Hu, R. Li, X. Cheng, and R. Bie, "Secure multi-unit sealed first-price auction mechanisms," *Security and Communication Networks*, vol. 9, no. 16, pp. 3833–3843, 2016.
- [24]. W. Dai. (2009) Crypto++ 5.6. 0 benchmarks.<http://www.cryptopp.com/benchmarks.html>. [25]N. Jansma and B. Arrendondo, "Performance comparison of elliptic curve and rsa digital signatures," [nicj.net/files](http://nicj.net/files), 2004.
- [25]. L. Tan and N. Wang, "Future internet: The internet of things," in 2010 3rd International Conference on Advanced
- [26]. S. Amendola, R. Lodato, S. Manzari, C. Occhiuzzi, and G.
- [27]. R. Khan, S. U. Khan, R. Zaheer, and S. Khan, "Future internet: the internet of things architecture, possible applications and key challenges," in *Frontiers of*
- [28]. Z. Fang, Z. Zhao, X. Cui, D. Geng, L. Du, and C. Pang, "Localization in wireless sensor networks with

- [29]. coordinate database,” EURASIP Journal on Wireless Communications and Networking, vol. 2010, no. 1, pp. 1–17, 2010.
- [30]. P. Kinney et al., “Zigbee technology: Wireless control that simply works,” in Communications design conference, vol. 2, 2003, pp. 1–7.
- [31]. D. Hankerson, A. J. Menezes, and S. Vanstone, Guide to elliptic curve cryptography. Springer Science & Business Media, 2006.
- [32]. R. L. Rivest, M. E. Hellman, J. C. Anderson, and J. W.
- [33]. Lyons, “Responses to nist’s proposal,” Communications of the ACM, vol. 35, no. 7, pp. 41–54, 1992. Z. Fang, Z. Zhao, X. Cui, D. Geng, L. Du, and C. Pang, “Localization in wireless sensor networks with known coordinate database,” EURASIP Journal on Wireless Communications and Networking, vol. 2010, no. 1, pp. 1–17, 2010.
- [34]. P. Kinney et al., “Zigbee technology: Wireless control that simply works,” in Communications design conference, vol. 2, 2003, pp. 1–7.