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QR Based Smart Shopping

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Abstract— The current system implemented in supermarkets is an inefficient use of supermarket's time and resources. As technology is evolving continuously, it becomes necessary for the supermarkets to adapt to the changing technological needs and enhance the customer's shopping experience, by maximizing the utilization of available resources. The purpose of the project is to identify and incorporate consumer motivations and attitudes towards new concept of QR based shopping in India.
The proposed system is planned, designed and built to be implemented in supermarkets and small retail stores like Reliance Fresh, Big Bazaar. The system focuses on hassle free customer shopping and reducing the burden which customers have to face while physically carrying the trolleys and bags during shopping. The project also aims at synergizing the marketing initiatives in the super market industry.

Keywords — *Shopping, QR based shopping, Supermarkets, Smart-shopping.*

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I. INTRODUCTION

Nowadays, whenever customer enters a supermarket, he has to pick up the trolley and has to wander here there searching for items. If there are products which are supposed to be weighed like grains or pulses, then customer has to weigh the products and there is a possibility that customer may have to wait there in a queue for weighing. Once shopping is done, again there is a possibility that customer may have to wait in a long queue at counter where the products are scanned and bagged. The entire process is time consuming and tedious. For tackling such situations, the store has to increase the number of counters & number of attendants and hence increasing the running cost of the supermarket.

To improve customer's shopping experience and to reduce the consumption of time, we have proposed a QR based smart shopping system. Using our system customer will create a tentative shopping list on the software provided. The software will provide name of supermarket which is having maximum number of products, as per customer's shopping list.

As the customer shops in the super market, all the products selected by him/her will be registered in the system and accounted for. Simultaneously, the selected products will be marked on the software to which customer can refer at any point of time. Once a product is scanned using QR code, customer can move on to the next product. Once the complete shopping is done, the customer will approach the counter where bill will be generated and products will be ready. Customer just has to pay the bill and collect the products and then he/she may leave.

Incorporation of this system will reduce the running cost. It will also help in reducing the time consumption for shopping along with hassle that customer has to face in today's system. It will increase the customer satisfaction by providing a good and hassle free shopping experience to customer.

II. PROPOSED SYSTEM

The proposed system uses QR code to assist in shopping. The system is supposed to be used in super markets where many people need to wait in long queue for billing. The proposed system will help to reduce the time spent in billing along with the need to physically carry trolley. In the system, there will be a QR (Quick Response) code associated with every product placed in supermarket. The QR code contains all the information about the product like its name, location etc.

which will be read by the QR code scanner provided in the application. The customer will first be able to create a list of desired shopping items and then based on the data provided the super markets having maximum number of items from the customer's list will be displayed. Now, the customer can decide which super market to visit for shopping, according to the result provided by the application.

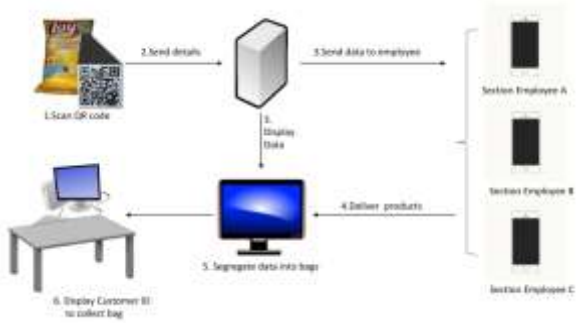

Fig. 1 – Flow diagram for QR based smart shopping

When the customer selects the desired store for shopping a rough map of the super market will be provided to the customer based on the location of the products, which is stored in the database. Now the customer is free to shop according to his/her preferences and later when all the required items in list provided by customer are completed then a notification will be sent to the customer stating that the shopping is completed and will be asked to further continue shopping. All the items scanned by the customer and selected quantity will be kept ready at the counter, assigned by the server and the customer can pay the bill and collect the products. The proposed system will dynamically assign the counter to the customer based on the present load of the available counters. The employee of the Super market will assist in manually selecting and delivering the required products to the respective counters informed to them via their smart phone app.

The proposed system will make use of following modules:

A. SMART PHONE APP :

The system will consist of an Android app, where customer will create the shopping list and will select the super market. Based on his selection, map of the super market will be provided to the customer on the app. An interface will be provided to the customer in the app, to scan the QR code of the product and select the quantity. Once the complete shopping is done, customer has to click on the 'Finish Shopping' button to stop the shopping.

B. DATABASE :

The server will be using MySQL database. The system's database consists of following tables.

- Customer table – This table will consist of all the customer information which includes Customer name, phone number, customer ID, etc.
- Product table – This table will consist of all the products information from different super markets which includes product name, quantity, super market, section, etc.
- Employee table – This table will consist of employees' information which includes Employee name, section, Employee ID, etc.

C. QR CODE :

A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera. The code itself stores large amounts of information that is easily scanned and kept onto a mobile device. The required data is then extracted from patterns that are present in both horizontal and vertical components of the image, [1].

III. REGISTRATION

Initially, a customer will be required to register himself using his/her name & phone number. The associated phone number will be used as a primary key. Unique customer ID will be generated for each customer and will be tracked afterwards using the same user ID.

IV. ENCODING AND DECODING

After successful registration user creates a list of desired products. It will be sent to the server which contains the super markets list and their corresponding products. These products list will be matched with those stored in database and the super market containing the maximum products will be shown as recommendation.

Once the customer confirms the super market, the shopping begins by scanning the QR codes given below the products. The scanning process will include the confirmation of the desired quantity of products required. Following the confirmation of process the entire product details will be encoded into JSON format which include name and value pair and then sent to the server. The server contains PHP script, which will then decode the JSON format and extract the quantity and the section of the products. Based on the section, the products request consisting of its name and quantity will then again be encoded into JSON format and later sent over via local network to the desired employee phone. This data will then be used by the employee to deliver the desired products to the employee present at the counter, who will then segregate the products into assigned bags.

V. CHECKOUT

The entire system will require real-time data processing and display the same on the screen present on the counter. The

customer's data regarding the products purchased will be refreshed after an interval of 30 sec, will also address the issue of removal of product from those that are scanned. Once the complete shopping is done, the customer can click finish which will send a particular data string indicating the server to stop the transactions of the particular customer ID. The customer can later show his/her ID to get his/her shopping bag, check products if needed and later pay and may leave the super market.

VI. FREQUENT PATTERN ANALYSIS

Initially, the system will comprise of sometime in delivering the products but that time will be reduced substantially as the data collected will be analyzed to find the products which are frequently used, and based on this information those products section will have more employees to process the incoming request. Frequent pattern analysis will be used to derive the frequent pattern of products purchased which will help to make the proposed system more efficient.

VII. CONCLUSION

In this paper, a QR based shopping system is being proposed to make shopping a better experience. In the future work, we plan to implement a fully functional system with a working prototype..

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