QR-code Based Effective Time and Space Management in Shopping Malls

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Abstract- The study of this paper presents a new technique to use a QR-code. With the recent emergence of social commerce the future of shopping is evolving. Consumers with QR (Quick Response) code application can find a modernistic way of buying the products and goods. The endorsed system overcomes the glitches of time and space faced by the retailers and consumers while shopping. The application peruses a unique QR code of the product which will be consigned in front of same product and the user can get the option of add to cart. User can exclusively select multiple products and copies of the identical product, finally the user will send the comprehensive detail of his list to the counter. The study concludes that shopping time of consumer and space for the groundwork of hypermarket is diminished.

Keywords— QR-code, Space management, Time management.

I. INTRODUCTION

QR code abbreviated from Quick Response Code is the trademark for a type of matrix barcode or two-dimensional barcode first designed for the automotive industry in Japan. Nowadays QR-codes are widely used for their ability of high capacity storage of up to 7,089 characters and can be encoded in one code. These square pattern codes consist of black modules on a white background. The information are not only stored horizontally but also vertically. There are many significant features of QR-code such as: high capacity data storage, small printout size, dirt and damage resistant (QR codes have an error correction capability), readable from any direction in 360 degrees and with a structured appending feature. Moreover single QR-code can also be divided into 16 such codes. [1]

From past 2 decades, use of mobile devices has greatly amplified, that has led to ease of carrying out day to day activities. Nowadays, wireless networks have taken over the entire world. Business and financial transactions can now be done easily and securely, anywhere and anytime. Using Internet, connections can be established with any devices almost anywhere in the world and can share necessary information amongst them. The daunting tasks faced in daily lives can now be accomplished by few of clicks on our Smartphone. [2]

In recent years, online shopping has become a popular trend around the world. People have started to depend on online shopping heavily which made it offer all kind of goods and services. Recently, virtual shopping is used by the shoppers to purchase products through their smart phones. The process of virtual shopping happens when a buyer downloads a special application in smart phone, and uses the apps to scan the barcode of the product. The barcode includes all the information related to the product such as brand name, type and price. Moreover, virtual shopping doesn’t require taking a huge space to build a store or hire a lot of employees. Instead, products such as grocery and clothing are presented in the holders attached with a barcode for consumers to view. Virtual shopping is considered environmentally friendly and saves a lot of costs. [3]

The project presents a novel method of collaborating ease in smart shopping and the customer contentment while doing shopping offline. This is implemented using an Android application. In shopping mode, the customer needs to physically pick up his purchase, carry cash, along with them and wait in the long queue to make payments. The application mentioned here would read the QR code(s) of the product(s) & add it to the shopping cart in the application. It provides methods to change the quantity of product/s purchased and edit the list. Along with this the customer would be informed about the on-going offers in the store. Payment can be according to customer convenience. [4]

Shopping guide mall layout map is most common in the mall as a shopping guide, which shows the customer’s position and the layout of mall section directly. However, it may be little help for those first time customers or customers with bad sense of direction. [5]
II. PROPOSED METHODOLOGY

QR code has the capacity to store good amount of data, so the study recommends utility of them in the super market. Before entering in the mall, customer must install application and logged in with valid credentials. Once the customer is set to go s/he will scan the QR code of product which will be positioned in front of it. Two alternatives will be offered viz. product details and add to cart. After confirming the product purchaser can carry on with shopping and conclude with shopping.

After confirming the cart, the user can elect one of the payment alternatives. If home delivery option is selected, after completion of formalities order is sanctioned.

If customer wants to take away s/he goods, bill is spawned in QR code format. This code will be scanned to complete the payment process.

The customer, with the help of this system, can avoid the long waiting queues, which will lead to proper time management.

Since the quantity of goods in racks is less, the man power automatically is condensed. This gives advantage to the owner economically. Space required for the accommodation of goods is less which will help the possessor in maintenance.

![Fig2. Architecture diagram](image)

A. Algorithm

1: Start
2: User has registered himself on app
3: scans QR code for shopping
4: Details get displayed of product
5: Add to cart or wish list
6: Finalize the cart
7: Places order
8: Receives the order confirmation
9: If amount is > 1000 else goto 19
10: Then ask for home delivery
11: If yes goto 12 else goto 19
12: ask for mode of payment
13: generate QR of bill
14: Estimate Delivery date
15: order is packed and dispatched
16: on delivery ask for QR code and remaining amount
17: if data matches order delivered
18: else order is took back
19: payment is done at cashier
20: generate QR of bill
21: order is packed and dispatched
22: QR code is checked and order is delivered
23: End

B. Modular Description

C. Future Enhancement

- QR code is limited to contain only 7089 characters so incase if the bill size is increased, it will create errors. It can be overcome by increasing the storage size of QR code.
The bill shall contain the total weight of the parcel so that customer can verify the products bought & received, for customer satisfaction.

The concept can be assembled on other platforms such as ios & windows.

III. SUMMARY

Since mobile phone has become a popular consumer friendly product. This advantage is used for the betterment of people in shopping. The application of store will get connected to the Wi-Fi of the shopping Mart and can scan the unique QR code of the product. User can select the multiple products and multiple copies of the product after finalizing the product list the user will send the complete detail of his list to the local server. The counter will get the information about the customer’s list and can select home delivery if allowed or collect from the counter option. The application also considers an online payment option. The study concludes that the implications for retailers to develop more effective mobile marketing communications using QR-codes and suggested direction. After implementation of this idea the mart gets more space due to which there can be increase in customers and also the customer will save time on shopping. Basically, this idea optimizes the time of customers and space required to setup the mart.

IV. BLOCK DIAGRAM OF PROPOSED SYSTEM
b. Admin Side

- App of shop should be provided by admin
- Generate QR code of products with proper
- Products in cart should be saved in db
- Admin generate QR code of bill with details. And
- further details

- Bill amount is >1000
  - No
  - Take payment
  - Ask for home delivery

- Yes
  - Take payment at cashier or cod
  - Give Estimate delivery date
  - scan the bill & deliver the product if
    matches

VI. CONCLUSION

To replace the old technology of barcode scanner its new alternative QR code is introduced in
the new world of technology. QR codes have improvised the disadvantages of the barcode i.e. the
data storage size is increased. QR code also leads to improve the revenue and advertisement for the E-
commerce sites. By upgrading technologies QR code’s data capacity can be increased. Also the time
required for shopping is minimized and the space required for the storage is also reduced.

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