A NOVEL ONLINE SHOPPING ENVIRNMENT USING INTERACTIVE QR CODE

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Abstract: Human life is getting hectic and challenges are making their space for hurdles to get time even to breathe. Even in this fastest life style getting a bunch of genuine and quality product, in all ranges is a big challenge. The work presented in this paper ensures basic and new services in aspects of online shopping as e-commerce site. In almost all expected things like on time buyer assist, a broad selection range, timely delivery and many more. This ecosystem of QR code-based e-commerce platform is constructed to carry out business efforts. The idea ensures superiority of each product to be showcased on an online store. Social relevance is an utmost consideration while designing and implementing this system. The system has proved to be more efficient and accurate as compared to the existing manual systems and those developed for pharmaceutical applications recently.

Index Terms - **QR Code, Mobile, Smart phones, environment,.**

I. INTRODUCTION

The Interactive Online Shopping Environment (IOSE) based on Quick Response (QR) code [1] minimizes people's waiting time. This period is converted into a moment for shopping and, occasionally, a period to travel. The various QR codes for commonly used home items are generated in this format. These QR codes are displayed alongside the product advertisements at many locations, including railway stations, movie theatres, bus stops, and public spaces. Malls are closer to people. After glancing at billboards and deciding to purchase the product, a person will immediately use a smart phone with a QR camera to scan the QR code[2]. An end consumer orders the product after gathering all the information about it, including the cost.

From the time an order is placed until it is delivered, this structure accepts operational directions from consumers, processes and their expenditures and provides information about the order's authentication, and performs several additional tasks. This type of online shopping environment has demonstrated the decrease in the cost of significant investment by stakeholders and demonstrated that customers are satisfied with this structure instead of traveling to a mall and taking time away from their busy schedules to purchase. Finally, it is demonstrated that both the investments made in the shopping center and the travel time required to get there have decreased[3].

This end to end system, which can make online dealings with all the essential information and suitable security, will make it feasible to provide shopping services. The data mining approach named Association Rule Mining (ARM) [4] is used to collect various forms of data for analysis and future improvement based on community daily purchasing needs. The major goal of this study is to employ an Android smart phone, which is widely used for shopping [5], to develop an interactive advance and real-time capture system for purchaser materials. They are not required to go to a mall. As a result, they are pursued in public spaces and forced to turn their waiting time into shopping time. Currently, every study, investigation, and use of QR codes claims that they are effective for advertising at minimal rate and are globally applicable. It is intended for people who use mobile phones.

People can be contacted at any time and location with use of QR codes [6]. There is no further special equipment necessary outside the smart phone, and there are no middlemen between the users. Android was used to create the idea for the QR code charging system for shop requests, and verification is carried out as the QR Code is scanned using the cell phone scanner application. The QR Code will enable a successful connection after the client login has been registered via the application. The transaction is authenticated for the password when scanning the QR Code. After the verification is finished, the buying is complete by carrying on with the shop process. The Clever purchasing practice offers a creative way to combine the simplicity of smart purchasing with a feeling of financial stability [7]. The user must physically pick up the item while in shopping mode, bring money, and hang-up in a huge line to pay. A fore said methodology would scan the Q-R codes on the merchandise and add it to the shop cart. It offers ways to amend the list and change the number of purchased items. The customer would then be alerted about the store's ongoing promotions. Cash on delivery is an option for payment. The user is prepared to use a scanner to read the Q-R code on the side of the object he desires to buy.

Following the scan, a web service is called to establish a connection with the store's database. As soon as the link is made, the user is brought into synchronization with the record and the details of that object, which are then made available to him. The client will choose the item, put it in his shopping basket, pay for it, and the item will be delivered to his door.

II. Data and Sources of Data

Different techniques are used in various applications to create QR codes. Somdip Dey et al. presented an encryption-based system in [8]. One technique involves treating an encrypted message like a long string and generating its opposite. This would result in the creation of a new coded message that is then changed into a Q-R code. A QR code security technique was offered by Sankara Narayanan et al. [9]. As soon as the user clicked to a webpage after scanning the QR code, a malicious file was secretly downloaded onto their device as part of the QR code assault. S A QR-Maps mechanism that is utilized in Smart phones was presented by Ambareesh et al [10]. to determine precise user positions indoors. A user only required to find a decoded form of the QR code using the maps which are QR dependent through software on their mobile phone when they arrived at an interior area and wanted to know where they were.

Ji-Hong Chen et al. [11] provided the Q-R in a dual representation observable and unseen, included it in graphical form. Thus, observable section gives handlers including easy access to associated information, but the watermark may be secured by an invisible watermark. Sana Khojaet al. [12] produced an application developed in Android b for ticket explanation using the code of QR. Before the user entered or departed the station, the voucher checkers read their QR code. This program automatically calculated the fee of a passenger based on the distance they had to travel based on given data i.e. the person's name and picture of the traveler.

Using QR code technology, Neha Yadav et al. [13] establish a cashless institution campus. The framework was utilized to generate all cashless transactions on campus. To continue with the payment, the user had to scan the Q-R code. The purchase money would be deducted from the account if the Q-R code was legitimate. Kinjal et al. [14] demonstrated various fields including scientists had used coding of QR for testing. These included the use of color barcodes, one-much conversion to boost information, and scratch removal techniques, among others, to increase data capacity.

Quick Response (QR) Codes in Libraries, was presented at the conference by Iranna Shettar et al., [15]. It was a study of how QR codes were used in the Central Library. He demonstrated how to create QR codes and how they are used in contemporary libraries. The work of Phaisarn Sutheebanjard et.al. [16] was an extension. It was based on a Q-R producer. A QR code may store more data than aold-style bar code. They explained how to use a computer browser to create Q-R codes for sites, mails, corporate cards, printing ads, and other applications. Donny Jacob Ohana et al. demonstrated the production of QR codes using Google API (GCAP Interface) [17]. Decoding QR code symbols is done in a variety of ways, including submitting short codes sent to a website and processing images with a mobile device.

Hussain et.al. [18] demonstrated a study on the benefits of use of a Google Application Interface which including content of the codes of QR. They went through the charts linked to the Google Application interface, where the content was also the content of QR generated codes. They also explored ways to customize charts and encode them in QR codes. Additionally, they went into detail about how to customize a QR code's size, color, and number of variables that are displayed in charts using the Google API. Ji Qianyu et al. [19] published a book that explored the idea of the QR code and the advantages it offers businesses. The book included a variety of QR code-related issues. These were the methodology, types, and qualities of QR codes, as well as the new emerging areas providing solutions.

Abhishek et al. demonstrated an image based QR code, which was a difficult challenge as a result of variances in size, orientation and ambience[20]. To recognize a QR code, numerous methods have been put forth in their work on creating SMS in the form of a QR code, Mohammad Zainuddin et al. [21] concentrated on creating QR codes to generate SMS. The upcoming development may involve creating contacts based on QR codes for a phonebook. In their paper, László Várallyai et al. [22] gave information about QR codes. They remarked that the total data that could be stored in the QR Code format was affected by the parameters of error correction.

Devinder et al. offered developing a new restriction to mobile safety and defensive systems. [23]. The authors of this work made it clear that as the use of QR codes increased, so did the threat they posed to mobile security. They also detailed many types of potential attacks that QR code users would encounter in the future. Sayantan Majumdar et al. [24] investigated Innovative Security Procedures with the help of implementing QR code for a mobile based on Android. Elliptic curve cryptography (ECC), commonly known as the Elliptic Curve Digital Signature Algorithm (ECDSA), was a method of public key elliptic curve algebraic structure over finite fields.

III. RESEARCH METHODOLOGY

The primary goal of the developed system is to offer clients, a solution to issues they encounter when doing physical shopping [25]. QR codes will be introduced to accomplish this. Customers can scan the Q-R code of the goods they need to buy at all time and from everyplace. All of the products will be exhibited on an electronic wall in various public locations, and a QR code will be available to scan the items and submit orders for purchases. After a customer place an order, the requested items will be delivered to their door. The order of work in the system we have created is as follows.

1. User registration.
2. Using the ID and OTP to confirm the user.
3. The creation of QR code of different products.
4. Disseminating Q-R code to the public.
5. Online order acceptance and second verification.
6. Payment Processing.
7. Sending a demand to the Packing Division.
8. Customer endorsement of demand delivery.

Fig.1 shows the complete flow of system. The admin will connect into the web-server in the presentation layer to access the product and billing systems. After scanning the product's QR code, the customer will see a list of the available products. The application server will gather QR code scan data from the business layer and pass it along to the data-base layer. The administrator can keep and update modifications made to the database server in the database layer.
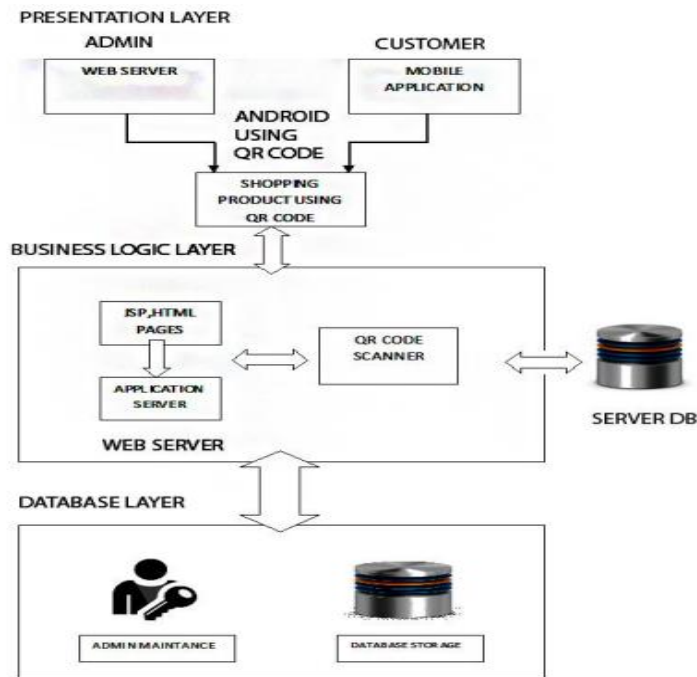

Fig.1 System Architecture

In Fig. 2, If the customer is a new entrant, it is required that he first registers into the system. Once registered, the customer's information is directed to the cloud server [26]. The data related to the various customers will eventually be stored in a database, and the admin panel will do the authentication.
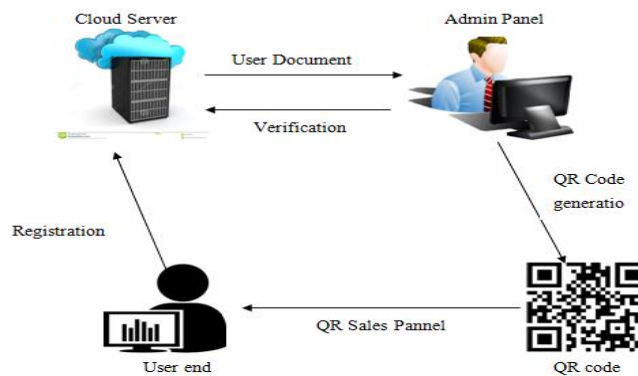

Fig. 2 Registration Mode

In Fig.3, when a client scans a product's QR code, the server panel receives a URL request. Following the password verification, the server panel will send the data to the sales panel.
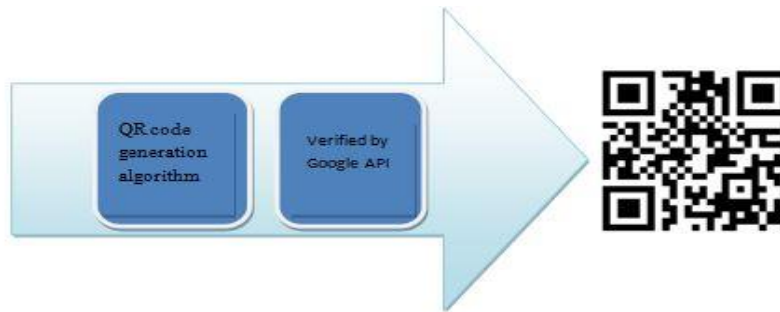

Fig.3 Validation mode

Fig. 4 Steps for QR-code generation

Fig. 4 show QR code generated using algorithm along with comparing it by google's API service so to keep uniqueness of code for particular product.

The three-step process to be followed is demonstrated in Fig. 5. It shows a product registration panel for shoppers and is available for registering various products. The algorithm for creating QR codes is used to generate the code. Details are shown on the display screen after the production of the QR code.

Fig. 5 Shoppers Panel

When a customer scans a QR code, infoof product is shown on his display, and the customer can then place the order. After the goods have been scanned and verified, the database is updated with the product's remaining amount. The customer can alter the list of products if any changes are necessary. The product's color and quantity can be chosen by the customer. On the user screen, the bill is displayed before the customer adds it to their cart. The client will provide the necessary details. The color and quantity of products can be chosen by the customer. On the user screen, the bill is displayed before the customer adds it to their cart. The client will provide the necessary details as demonstrated in Fig. 6.
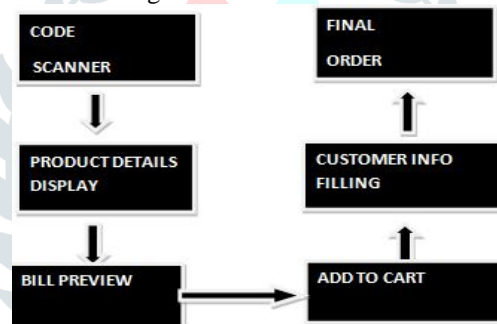

Fig. 6 Customers Panel

Fig. 7 is the Delivery Panel. The order delivery process starts at the delivery panel when the final order is placed. If the customer has already registered, the database will be updated with his information, and if he is registering for the first time, new information will be added.
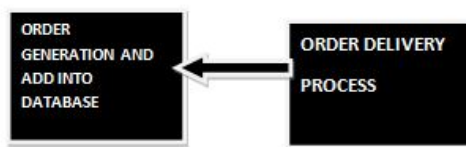

Fig. 7 Delivery Panel

IV. RESULTS AND DISCUSSION

4.1 Results of Descriptive Statics of Study Variables

QR codes show their effective impacts in an application like online shopping. They have benefits which can be measured in terms of quantities termed as efficiency, throughput, and accuracy. These parameters help us to compare a system using QR codes to existing systems performing online shopping.

By Efficiency of QR codes we refer to making an efficient online shopping environment. The parameters to be considered in this case are a reduction in the time and effort required for a purchase of an item. The procedure goes by a user scanning the code with a camera attached to his smart phone required to access information of a product, reviewing the product and finding out pricing thus eliminating navigation through multiple pages on websites or apps. This procedure reduces errors and confusions caused due to manual entry. Throughput of a QR code improves in online shopping by synchronizing the checkout process. For example, they are used to store information related to payment or billing and shipping details. This reduces time for purchasing and risk of errors or delays. Accuracy of QR codes improves in an online shopping environment by using correct ordering and delivery of products. Unique identifiers of

products can be enabling using QRs such as SKU codes or serial numbers which are scanned at various points in the supply chain. This reduces risk and fraud on counterfeit products. We could compare the above three benefits by conducting a comparative study between an online shopping environment that uses QR codes and one that does not. It also makes possible to measure metrics such as the time taken for a purchase to be completed, errors or mistakes made during the process and satisfying the user. It enables us to compare the cost-effectiveness of the two systems. It takes into account factors such as development costs and maintenance expenses. The advantages of using QR codes in an online shopping environment can be existing in a concise manner.

Table I displays a representation of efficiency, throughput and accuracy of the developed online shopping environment using QR codes as compared to existing systems in a tabular form.

Metric	QR Code System	Existing System
Efficiency	quick access to product information by scanning the QR code with their smartphone camera.	Manual search for products on the website or app
	save time and effort for navigation	time-consuming and require more effort.
Throughput	used to store payment and shipping information, which can be automatically populated during the checkout process.	manually enter payment and shipping information during the checkout process
	reduce the time taken to complete a purchase and minimize the risk of errors or delays.	can be time-consuming and prone to errors.
Accuracy	used to store unique product identifiers, such as SKU codes or serial numbers	may rely on manual data entry or barcode scanning.
	can be scanned at various points in the supply chain to ensure that the right product is being shipped and received.	can be prone to errors and increase the risk of fraud or counterfeit products.
	can reduce the risk of fraud or counterfeit products.	

Table I: Comparison between developed QR code system and Existing system

IV. ACKNOWLEDGMENT

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