**AN AUTOMATIC BILL GENERATION OF PRODUCTS USING DIGITALSIGNATURES AND QR CODES**

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**ABSTRACT:**

Standard image codes like one-dimensional barcodes and two-dimensional codes with black and white patterns identifies a product for its value and basic features but does not authenticate it, moreover not every product that is identified, is used for authenticating manufacturer's warranty. This paper is to propose a real time capturing system for consumer using Quick Response (QR) code in a Android smart phone. In recent years, extensive research has been carried out on vision-based automatic identification technology that recognizes image codes using smart phones to provide various services that can recognize the authenticity of any product. Using Multiplexing and De-multiplexing process encoding and decoding the information from single QR code with special symbols and split the data back to their QR Code pattern .These QR Code pattern can be read by Android Smartphone’s. QR code verifies products by capturing it through the smart phone, then decodes and sends it to the server for authentication. The customer forwards the selected product list to the server that enables the consumer to decide based on the products authenticity. It will proceed further for the payment of bill only if the customer enters the security code. The security code mechanism was introduced in order to recover the message and provide authenticity ensuring the right one is using the application.

**KEYWORDS:**

Authentication, Multiplexing and Demultiplexing, Quick Response (QR).

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1. **INTRODUCTION**

Non-trivial extraction of implicit, previously unknown and potentially useful information from data. Exploration and analysis, by automatic or semiExploration and automatic means, of large quantities of data in order to discover meaningful patterns. Data mining is about explaining the past and predicting the future by means of data analysis. Quick Response Code is another form of barcode. They can be used for business cards and other bits where people scan them into a system. QR Code is a twodimensional symbol. It was invented in 1994 by Denso, one of major Toyota group companies, and approved as an ISO international standard (ISO/IEC18004) in June 2000. A QR Code Scanner (mobile application of a Smartphone) can decode this information and show the information to the user. This two-dimensional symbol was initially intended for use in production control of automotive parts, but it has become widespread in other fields. Now QR Codes seen and used every day everywhere in Japan for the following reasons: Several characteristics superior to linear bar codes: much higher data density, support Kanji/Chinese character, etc. It can be used by anybody free of charge as Denso has released the patent into the public domain. Data structure standard is not prerequisite for current usages. Most mobile phones in Japan equipped with cameras that enable reading of QR Codes can access Internet addresses automatically by simply reading a URL encoded in the QR Code.

The original information is divided, to form a string of characters, into n parts, where n is the number of QR Code pattern that can be formed by a string of characters. The data in each part will form ordinary QR Code corresponding to that part of data. The module correspond to the same position in each QR Code, except for the part of the Finder Pattern and Timing Pattern are multiplexed and using a special black and white symbol to represent them. The symbols for representing the modules, after multiplexing, this QR Code with special symbols was scanned or read by optical device such as a scanner or a camera phone, the picture image can be analyzed. Each special symbol is recognized and the de-multiplexing process decode the information from single QR Code with special symbols and split the data back to their QR Code pattern where these QR Code pattern can be read by ordinary QR Code reader. The data in each QR Code pattern were recognized and concatenated back to form its original information.

1. **RELATED WORK**

C. Baras and F. Cayre (2012) propose the authentication problem of real-world goods on which 2D bar-codes (2D-BC) were printed and we take the opponent's point of view. When making sure a realworld good (such as medicine, wine, textile) is genuine, 2D bar-codes (2D-BCs) are an alternative to watermarks. 2D-BCs (also called Data Matrix or Data Grid) are black-and-white visible images encoding a good binary identifier using a (secret) cryptographic key in a pseudo-random way and printed on the goods package. The opponent is assumed to have access to NC noisy copies of a genuine 2D-BC (noise being due to printing and scanning processes). A simple estimator of the 2D-BC based on copies averages is proposed, letting the opponent print a fake 2D-BC which aims at being declared as genuine by the system detector. Using an automated detection process based on a scan of the 2D-BC, a correlation score is computed and compared to a pre-determined threshold in order to decide whether the good is genuine or fake. T. V. Bui at all (2014), suggested that Response Code (QR code) is widely used in daily life in recent years because it has high capacity encoding of data, damage resistance, fast decoding and other good characteristics. Since it is popular, people can use it to transmit secret information without inspection.

The development of steganography in QR code leads to many problems arising. How to keep the original content of QR code and embed secret information into it are the two main challenges. Hiding secret information based on bit technique is so fragile to modification attack. If an attacker change any bit of hidden bits, it is impossible to recover the secret information. In this paper, we proposed a scheme based on Reed-Solomon codes and List Decoding to overcome this problem. They also conduct our solution by analyzing the complexity, security, and experiment.

Falguni Patil, at all, 2015, used the detection of QR codes, a type of 2D barcode, as described in the literature consists merely in the determination of the boundaries of the symbol region in images obtained with the specific intent of highlighting the symbol .Within objective examinations there are also several categories, such as the commonly known Multiple Choice Questions (MCQ), True/False and Extended Matching variety. Other variations such as Single Correct Answer (SCA) and Multiple Correct Answers (MCA) can complicate the picture further. In this system also use QR code technology-integrated approach makes the benefits of evaluation activities with high processing speed, real-time feedback, volume reduction, and environmental protection advantages.

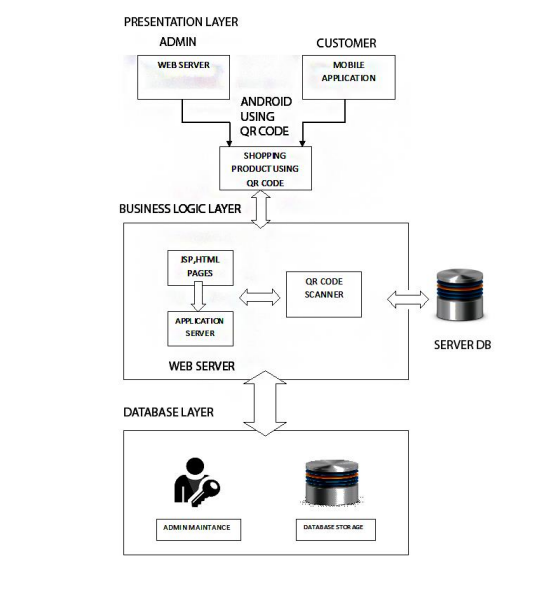
A. Surekha, P.M. at all (2015). Proposed an alternative method is proposed which uses application of visual cryptography. Two new approaches are proposed for the purpose of E-payment transaction. The first method requires customer’s limited personal information that is necessary for fund transfer during online shopping. This safeguards the customer data which indeed increases customer confidence and prevents identity theft. The second method is the generation of secure e-tickets for train and movie applications based on QR-Codes with encrypted content. The proposed methods are compatible with minimal infrastructure that is currently available with the customers. Sonawane at all(2014), providing the detail information about developing the security system for online banking transactions using QR code. In our project we use the QR code for providing the security to the online banking authentication system. In the QR code we are storing complex password. Smart phone we use for scanning the QRcode. When user goes for online banking transactions, he/she opens the bank website. After registration QR code is display on the page then user scan that QR code image with the QRcode scanner. Scanning result generate one string which is the combination of IMEI number of a phone which is register by the user and the random number, where random number is generated by the random number function.

**III.PROPOSED CONCEPT**

In the proposed system, we can scan QR code of the products they wish to buy. This applications allows QR code scanning, because it gets scan faster although if camera quality is not good, also the QR code are more relevant than barcode. User can update or remove items form cart. Its time saving process no needs to stand in long queue. So QR code verifies products by capturing it through the smart phone, then decodes and sends it to the server for authentication. The customer forwards the selected product list to the server that enables the consumer to decide based on the products authenticity.

**IV.BLOCK DIAGRAM**

The Architecture diagram consists of three layers, presentation layer, business logic layer and database layer. Customer uses android mobile application to shop the products using QR code which is connected to the administrator’s web server. The customer uses the QR code scanner to scan the administrator generated QR code. The client retrieves the details from the web server to check it with the customer.



Overall Architecture Diagram

The application servers such as JSP, HTML pages retrieve the knowledge base by scanning the QR code. These application servers are used at the front end for interaction with the user. These functions are abstracted within the web server which is bi-directionally connected with the server database and the database layer which is the third layer. The database layer consists of two parts, administrator maintenance and database storage. The administrator maintains the credentials such as, product details, membership details of each and every customer and payment gateway details. These details will also be stored in the database storage which will compare with the customer at the time of payment. The administrator will also maintain information about the products that are been paid by direct cash and PayPal way of money transaction.

**V.MODULE IMPLEMENTATION**

There are five modules. They are

Generating QR code image , Mobile Authentication , QR Code Scanner, Security Mechanism , Web service client

**5.1 Generating QR code image**

In this module are creating QR codes for encoding the information about the products. The product contains name, code, quantity and price. Each pattern is encoded and represented each module in QR code with black and white special symbols. QR code can hold information more than other bar codes. The format of QR Code includes unique Finder Pattern (Position Detection Patterns) located at three corners of the symbol and can be used to locate the positioning of the symbol, size and inclination.

**5.2 Mobile Authentication**

This module represents the authentication, which is used for the customer to login their details for the shopping processes. Logged user is redirected to the scanner module. Authentication is used as the basis or authorization determining whether a privilege will be granted to a particular user or process. The validation process is done on the web server.

**5.3 QR Code Scanner**

This module is used to scan the QR code and read the value of the QR code inside the mobile. QR code is a matrix bar code designed to be read by Smartphone. The code contains of black modules arranged in a square pattern on a white background. The information encoded may be text, a URL, or other data. If the user

selects the product, the details will directly forward to the server.

**5.4 Security Mechanism**

Once the bill is generated, the customer will get a onetime password to confirm the payment. This code is generated immediately after the product scanned by the customer isto be paid either by direct pay or PayPal online payment. The security code will be messaged to the customer’s mobile number. In case of any wrong credentials of the security code been entered, the QR code scanner application will immediately be closed. This is one of the main privacy mechanism added for registering no duplicate records of the customer and ensuring the authenticity for the customer that the payment is done by that individual. This way also ensures no misuse of the application.

**5.5 Web service client**

This module has the process of storing the selected product’s information from the client, which are send through the web service. All these information will be stored in the database. We are maintaining a centralized server in order to receive the selected product list from the customer through internet. In this module the merchant will check for the ordered items from the client. The Merchant will use this list to do delivery of the items to the customers.

**VI.CONCLUSION**

According to this project we proposed a real time capturing system for customer supplies using Quick Response (QR) code in Android smart phone. QR code verifies products by capturing it through the smart phone, then decodes and sends it to the server for authentication. The customer forwards the selected product list to the server and the response received from the server enables the consumer to decide based on the products authenticity. An interesting future study might involve simulating payment method at different gateway. The scope of this paper is to propose a real time capturing system for consumer supplies using Quick Response code (QR Code) in an android Smartphone. In future, checking the products after the payment can be done automatically with the help of embedded system.

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