

QR Code and Barcode Based Billing System for Shops using Android Smartphone

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Abstract— The objective of this paper is to propose a real time capturing system for consumer using Quick Response (QR) code in an 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 encode and 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 Android Smartphone's. 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. 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. The final payment can be done by both direct pay and Paypal way of money transaction. 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.

Key words: Android, Multiplexing and De-Multiplexing, Quick Response (QR), PayPal

I. INTRODUCTION

Non - trivial extraction of implicit, previously unknown and potentially useful information from data. Exploration and analysis, by automatic or semi - exploration 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. It is a multidisciplinary field which combines statics machine learning artificial intelligence and database technology. The key properties are automatic discovery of patterns, prediction of likely outcomes, creation of actionable information, focus on large datasets and databases. Data mining derive its name from similarities between searching for valuable business information in a large database for example, finding linked products in gigabytes of store scanner data and mining a mountain for a vein of valuable ore. Both the processes require either shifting through an immense amount of material, or intelligently probing it to find exactly where the value resides. Given databases of sufficient size and quality, data mining technology can generate new business opportunities by providing the capabilities, automated prediction of trends and behaviors, and automated discovery of previously unknown patterns. There are three categories in data mining they are,

classification, clustering and association. In this project, association and clustering concepts are used.

II. QUICK RESPONSE CODE

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 two- dimensional 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.

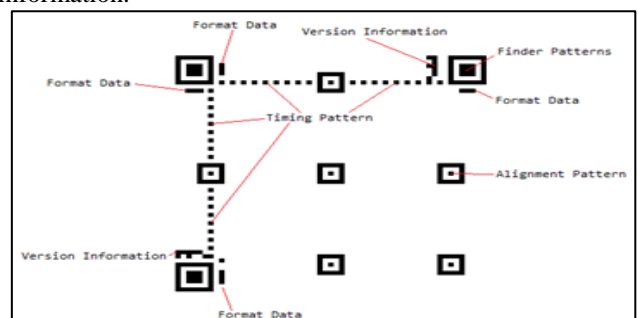


Fig. 2: Structure of QR code

III. BARCODE

A bar code can best be described as an “optical Morse code”. Series of black bars and white spaces of varying widths are printed on labels to uniquely identify items. The barcode labels are read with a scanner, which measures reflected light and interprets the code into numbers and letters that are passed on to a computer.

Bar code data-collection systems provide enormous benefits for just about any business. With a bar code data-collection solution, capturing data is faster and more accurate, costs are lower, mistakes are minimized, and managing inventory is much easier. The following are some of the benefits of bar code data entry.



Fig. 4: Structure of barcode

IV. SYSTEM DESIGN SPECIFICATION

- 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.

A. Advantages

- A simple scan captures the desired information.
- The Decoded data can be stored in the server and can be viewed by the cashier.
- High accuracy in image capturing.
- Customer can easily detect the QR code image, via his Android mobile itself.
- Users can save time by entering into priority queue kept for this application user than into the normal queue.
- This application is very relevant to use as it allows customer to remove items from his list by one click. It also displays the total amount of shopping customer had done, which allows customer to choose product according to his needs.
- People not having internet connection can also make use of this application as the shopping market environment internet friendly.

Smart phone can be used for shopping in malls and markets which makes Proper use of mobile technology.

B. Overall Architecture Diagram

Fig. 5: QR Code Billing systems

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.

C. Algorithm

- 1) Start
- 2) User has registered himself on app
- 3) scans QR code for shopping
- 4) Distails get displayed of product
- 5) Add to card 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

V. SYSTEM IMPLEMENTATION

A. Module Description

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

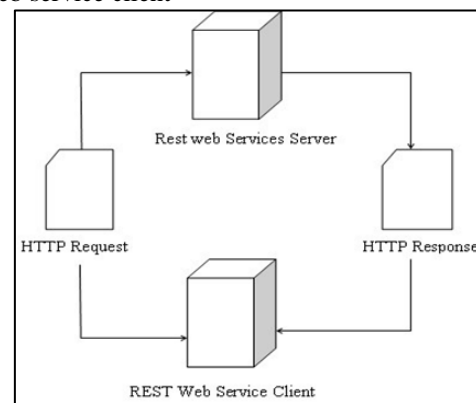


Fig. 6: Web Service Clients

VI. CONCLUSION

According to this project 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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