

# QR Based Advanced Authentication for Online Transactions

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**Abstract**— The QR code is Quick Response code. QR code authentication system is an open source and proof-of-concept authentication system. It uses two-factor authentication technique. It combines a one-time password and QR code scanning by using camera-equipped mobile phone. QR is extremely secure for storing all the sensitive information and transmits it as an encrypted form; still it is very easy to use and cost efficient technique. The system uses QR codes which are small two-dimensional codes. It encodes digital data. This system can be used for all hardware platforms that are for tablets, personal computers, laptops, camera-equipped cell phones. The system will automatically generate User ID and Transaction ID for identification of user by scanning. We can read QR code even if it is partially damaged. It provides a high level of security and authentication with untrusted devices. Due to these features of QR code, the system can be used for various critical transactions like Banking Transaction by using handy devices like Mobile phones and Tablets.

## I. INTRODUCTION

Nowadays any online service that aims to be secure should seriously consider for implementing a strong authentication method. QR code is a Quick Response code. It is an open source technique. It is a proof-of-concept authentication system [4]. Our system uses two-factor authentication technique. It combines a one-time password (OTP) [3] and QR code scanning by using camera-equipped mobile phone. QR is extremely secure for storing all the sensitive information and it transmits it as an encrypted form, still it is also an easy to use and cost efficient solution. Our system uses QR codes. These are small two-dimensional codes. These codes encode digital data. Our system can be used for all hardware platforms that are for tablets, personal computers, laptops, camera-equipped cell phones. If QR is partially damaged, still we can read it. Our system provides a high level of security and authentication with untrusted devices. These properties of QR code made them popular and they are used for different critical transactions like banking transactions. Our system contains different modules like Creation, Authentication and Transactions. We are going to add a new feature that is Cash Card which can be a good replacement for the Demand Draft and cheque.

## II. RELATED WORK

In 2002, Clarke et al. were probably one of the first to suggest the usage of camera-based devices as an alternative, more secured authentication method for critical transactions,

such as banking operations, and most particularly when connecting from untrusted computers [1]. Nowadays camera-equipped smart phones around us are increasing so rapidly that mobile-based authentication might become a popular method to authenticate in a short time.

In traditional Barcode data capacity is around the only 16 digit. QR Code has more Data Capacity. It has Numeric Code = 7,089 characters max and Alphanumeric code = 4,296 characters max.

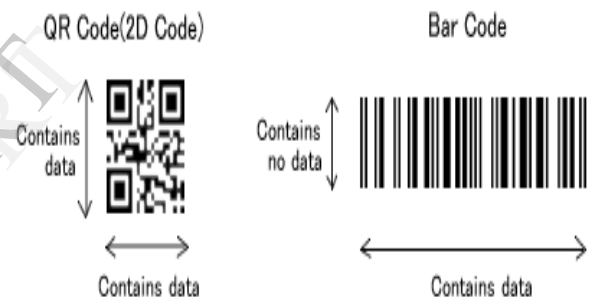


Fig 1 Comparisons of QR and Barcode

QR codes (Quick Response codes) were introduced in 1994 by Denso-Wave [2], a Japanese company subsidiary of Toyota. Initially, these codes were conceived as a quick way to keep track of vehicle parts, being nowadays extremely popular in Asian countries like Japan, South Korea, China or Taiwan and becoming more and more popular in western countries by the day. At this point, we can implement the authentication using the QR code for all platforms such as PC, tablet and mobile phones. We get the idea from the paper, related to our project and we use two-factor authentication. Also by using this project we can replace the demand draft and cheque by Cash Card.

## III. IMPLEMENTATION

The problem with QR codes is that, there is a lack of awareness among the corporate world about people interested to develop and use QR code. QR code-based authentication is beneficial to users, cost-effective and less time-consuming. Moreover, there is no need to carry an external device (such as scanner). Available ID, password and OTP are used for authentication, which is not secured ever. QR code-based authentication system that runs

on all hardware platforms such as PC, tablets, smart phones etc.

This system contains three modules that are Creation, Authentication and Transaction.

#### A. Creation

Creation module contains User information and system generated information. For sign up process User must enter his naming details, address and valid mobile. The valid mobile is mandatory for user.

After entering the naming details by the user according to the system will generate automatically unique QR code and OTP to the mobile. After the scanning of QR code and re-entering the OTP the registration will successful.

Figure 2: Registration

#### B. Authentication

In order to provide same level of security as a web application, the system shall provide login screen on the user's hardware device. The login entered by the user will be user ID, password and scan the unique QR code. After matching the user ID, password and QR code OTP will be sent on user's correspondence number, then OTP was re-entered by user. The values will be verified by the system prior the user having access to the system.

#### C. Transaction

Transaction can be done in two modes, by using Direct Transfer and by using Cash card.

##### a) Transfer:-

In this mode we select Direct Transfer mode. Then user has to add how much Amount to be transfer and the comment that will be the reason for why to transfer that amount should add in that transfer mode. Then QR code will be scanned if it matches then only transfer will do successfully.

##### b) By Using Cash Card:-

Instead of Demand Draft and Cheque we can use the Cash Card. In this mode we select pay to, amount pay to and comment that will be the reason for what to pay.

System will generate OTP, Unique QR code for Cash Card ,that QR Code will be scanned ,if it matches then only transfer will done successfully by using Cash Card.

<b>BANK NAME</b>	
Pay To:- <u>Kanchan</u>	
DATE:- <u>2014-01-25</u>	
Comment:- <u>for college fees</u>	
Amount:- <u>₹20,000/-</u>	
Amount in Word:- <u>Twenty</u>	

Figure 3: Cash Card

## IV. DISCUSSION

The performance of system depends on the in built camera which is use for scanning of QR code .If we use the high resolution camera then the performance of the system increases. Security is important point in this system because we perform online transaction of the bank. Also we provide the OTP with the QR code, if both are these match then user's authentication and transaction gets successful. This section identifies the how portable the system is? Our system is hardware independent, so that we can use our system for all hardware platforms such as PC, Tablets and Smart phones.

It is not necessary that the required QR code is printed on the paper only instead of we can print the QR code anywhere and scan it. Therefore it is easy to carry. The login entered by the user shall be user ID, password and scan his unique QR code. After verifying the user ID, password and QR code OTP will be sent on user's correspondence number, then OTP was re-entered by user. The values shall be verified by the system prior the user having access to the system.

## V. APPLICATIONS

- 1) Can replace Smart Card: It requires the separate scanner to scan the smart card. Smart card has less storage as compare to QR code.
- 2) Can replace Swipe Card: Swipe card can be cloned, but QR code can't be cloned. Swipe Card has no memory compared to QR code.
- 3) Secure way of transaction: QR code is scanned through camera equipped with hardware device therefore our system provides the more secure transaction.
- 4) Cash Card: Transfer can be also done using Cash Card which is replicable to Demand Draft and Cheque. System will generate Cash Card with QR code providing secure authentication.

## VI. CONCLUSION

Thus this system is very secure for different types of online transactions. Banking transactions can be done very securely. System uses two factor authentication techniques that is QR code scanning and one time password. So that system becomes more secure. QR code does not require any specialised scanner. It can be scanned using any inbuilt and autofocus camera so that Less cost required for the system. Thus this system is very efficient technique for online transactions.

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