

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirset.com

Vol. 6, Issue 5, May 2017

Mobile Based Antiphishing System Using QR Code

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ABSTRACT: Phishing is the larceny of sensitive information that swindles innocent users into disclosing private information such as credit card numbers, user names and passwords. The number of phishing attacks is increasing daily; hence, the resulting damages are growing. The motto of the paper is to analyze various phishing phenomenon and help the readers to identify phishing attempts against them. Another goal is to design an anti-phishing system.

KEYWORDS: Phishing, Antiphishing, QR code, Single Sign On (SSO), android application, image decoding, two-factor (2F).

I. INTRODUCTION

Today, development of communication and information technology, protecting the personal authentication information from infected computer or web phishing has become an important task to be achieved. The users are forced to open their personal and important (legal) information which includes credit card information, user names and passwords by directing them to enter user's details into counterfeit websites [1].

Objectives of QR based Security System:

- To develop a secure system using QR Code Technique.
- To Provides anti phishing mechanism to end users.
- To provide two level security using Advanced Encryption System algorithm.

Benefits of QR based Security System:

- They are beneficial for both customers and banks.
- Easy and secure way to handle bank account [2].
- QR codes are safest way to store the legal documents.
- In this project, we are maintaining the security using the QR code for avoiding the phishing attack [3].

II. BRIEF REVIEW OF LITERATURE

QR code is the type of matrix barcode (or 2D barcode). It is firstly designed for automotive industry in Japan. Barcode is machine readable code in the form of number and pattern of parallel line in different width. A QR code uses ideal encoding modes for example kanji, alphanumeric, byte/binary and numeric etc. to capably preserve data.

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The QR code system became well known in the industries because of its quick readability. QR code has more storage capacity compared to standard UPC barcodes. Applications include time tracking, document management, product tracking, general marketing and item identification.

A QR code is square grid contains a small black squares on a white background. QR code can be read by an imaging device such as a camera. The data is extracted from patterns which are present in both horizontal and vertical components of the image[4].

Today internet users use only one identity to access number of services. With SSO, users need not to recall every time username and password separately for each service provider, which helps the user to browse through the web seamlessly and easily. It is obvious that the online service that wants to be credible nowadays. It should be considerably serious for providing a strong authentication process. The designing and implementing the QR code is an open source system and proof of authentication system that uses a 2F authentication by merging a user's password of a locker and a Smartphone which act as an authentication sign. QR code is highly used to preserve the sensitive data. The information stored into system and transmitted is encoded to generate QR code and it is also feasible to use and cost effective. It can be used securely in distrusted computers. QR code is portable[5].

The proposed system handles the large QR code contents and error detection capability. This scheme can make the large latent into a QR code according to the error correction level and selection of QR version. The error correction capability can restore the data of QR if it is secured from damage [6].

System is designed to implement and test using an android phone application. The system generates the QR code that can be used in terms of tracking of identification objects, general marketing. Stealing user's sensitive information, running malicious code and compromising privacy of user and identity larceny are some ideal security dangers that a user could have in the background of system while user is just analysing the QR code. A QR code security system will give both users and generators security. This QR code system is backward consonant with agoing standards used in generating QR codes. The existing system has a small overhead in case of the cunctation required for content validation and righteousness verification [7].

III. METHODOLOGY

Module I: Generating QR code

- When user will enter the username then system will generate QR code image of user's information from database with one time ID which will be separate for all the QR Code generated.

Module II:

- The image of QR code which is generated from user's data which will be saved in system database. This system uses oracle 10g database.
- The QR code then captured using android mobile for that purpose an android application is required and is also a part of proposed system.

Module III:

- Accepting image of QR code from customer.
- System will accept QR code from customer via Bluetooth.

Module IV:

- User authentication will be done by comparing both the images. The QR code images will be decoded by using java programming and then they will be compared. If both QR code, the system generated image and the image sent by user will be same then that user will be allowed to enter password.

IV. SYSTEM ARCHITECTURE

The following system works as follows:

- The user gives his/her username to the system.
- The system will check that is he or she authenticate user.

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- If the person is authenticated, then the system will generate the one QR code.
- The user will scan the QR code from his/her mobile phone and send back to the system via Bluetooth.
- System will check the accepted QR code and generated QR code.
- If these two QR codes are match then user is able to access his/her locker.

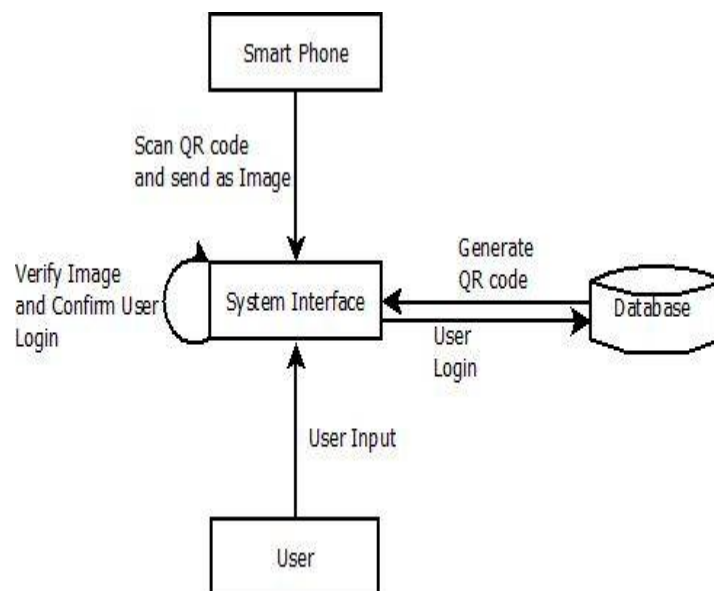


Fig. System Architecture

V. PSEUDO CODE

Random String Generation:

```
StringBuildersb = new StringBuilder();
Random random = new Random();
c = chars[random.nextInt(chars.length)];
```

QR code generation:

```
ByteArrayOutputStreamout = QRCode.from(newtext).to(ImageType.PNG).stream();
```

Camera intent:

```
Intent camera_intent1=new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
File file=getFile();
camera_intent1.putExtra(MediaStore.EXTRA_OUTPUT, Uri.fromFile(file));
startActivityForResult(camera_intent1,CAM_REQUEST);
```

Open Bluetooth intent:

```
Intent intent = new Intent();
intent.setAction(Intent.ACTION_SEND);
intent.setType("image/jpg");
PackageManagerpmr = getPackageManager();
```

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```
ArrayList<ResolveInfo>appsList1=(ArrayList<ResolveInfo>)pmr.queryIntentActivities(intent,0);
for (ResolveInfo info1 : appsList1)
{
    packageName = info.activityInfo.packageName;
    if (packageName.equals("com.android.bluetooth"))
    {
        className = info.activityInfo.name;
        break;
    }
}
intent.setClassName(packageName, className);
```

Enable Bluetooth:

```
Intent discoveryIntent1=new Intent(BluetoothAdapter.ACTION_REQUEST_DISCOVERABLE);
discoveryIntent1.putExtra(BluetoothAdapter.EXTRA_DISCOVERABLE_DURATION,DISCOVER_DURATION);
startActivityForResult(discoveryIntent, REQUEST_BLU);
```

Resize image:

```
graphics2D.setComposite(AlphaComposite.Src);
graphics2D.setRenderingHint(RenderingHints.KEY_INTERPOLATION,RenderingHints.VALUE_INTERPOLATION_BILINEAR);
graphics2D.setRenderingHint(RenderingHints.KEY_RENDERING,RenderingHints.VALUE_RENDER_QUALITY);
graphics2D.setRenderingHint(RenderingHints.KEY_ANTIALIASING,RenderingHints.VALUE_ANTIALIAS_ON);
graphics2D.drawImage(image, 0, 0, width, height, null);
```

Decode QR code:

```
BufferedImage outputImage1 = new
BufferedImage(scaledWidth,scaledHeight,inputImage.getType());
Graphics2D g2d = outputImage1.createGraphics();
g2d.drawImage(inputImage, 0, 0, scaledWidth, scaledHeight, null);
g2d.dispose();
String formatName = outputPath.substring(outputImagePath.lastIndexOf(".") + 1);
ImageIO.write(outputImage1, formatName, new File(outputImagePath));
```

VI. WORKING

- **Generating QR code:**

The user gives his/her username to the system. The system will check that is he or she authenticate user. The QR code will be generated according to user's information. Every time for each login separate QR code will be generated for every user. System will check first the user is valid or not by retrieving data from database.

- **Use of android application:**

The generated QR code will captured using the bank's unique android application. This application will save the image of QR code into the smart phone. The application also serves the purpose of sending the image of QR code to the bank's system. The image sending operation is done with the help of Bluetooth.

- **Decoding of the image:**

After the image is received to the bank's system the image will be decoded with the help of java programs.

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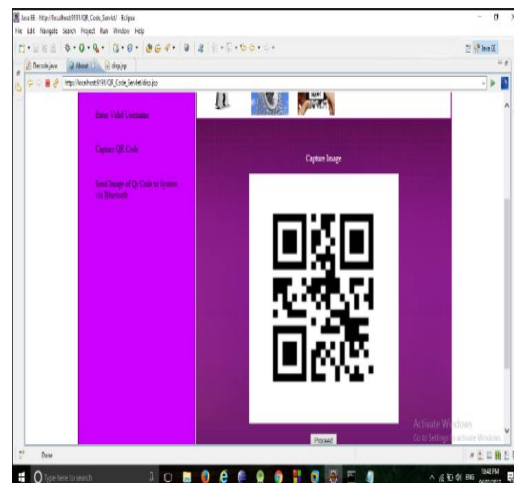
- **Comparison of the two QR codes:**
The image of the QR code received via Bluetooth and the system generated QR code will be compared with each other in the bank's system.
- **Access to the locker:**
If the two QR codes matches with each other then and then only the user will get the access to the locker of the bank.

VII. WEB AND ANDROID APPLICATION

The username insertion and QR code generation is shown in following figures.

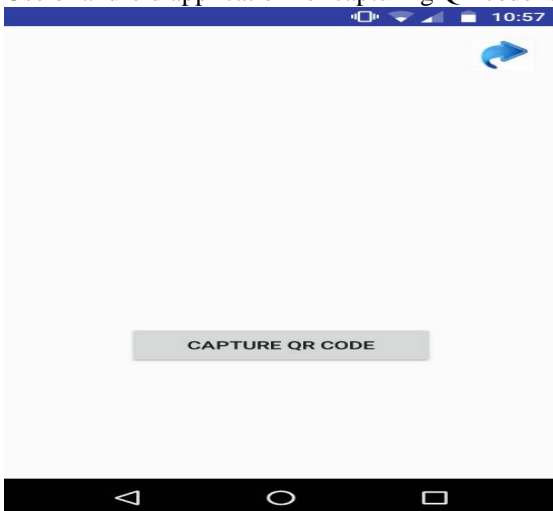


(a)

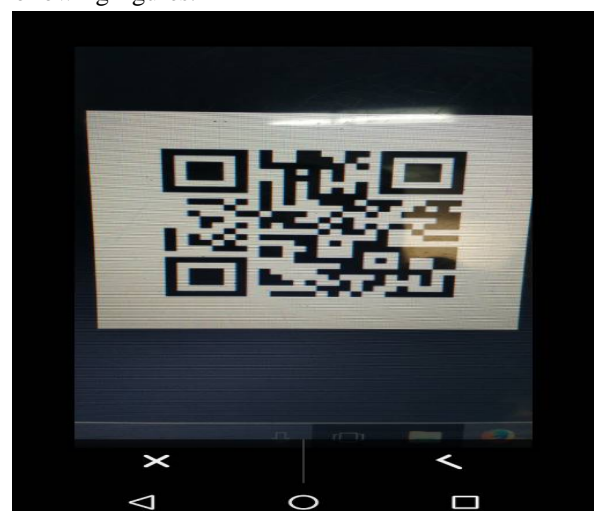


(b)

Use of android application for capturing QR code is shown in following figures.



(c)



(d)

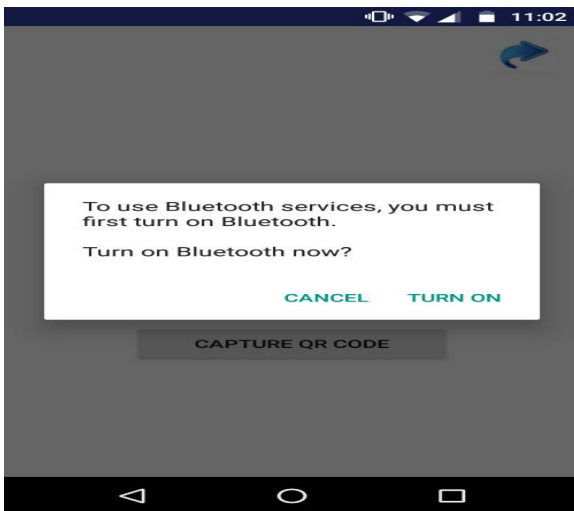
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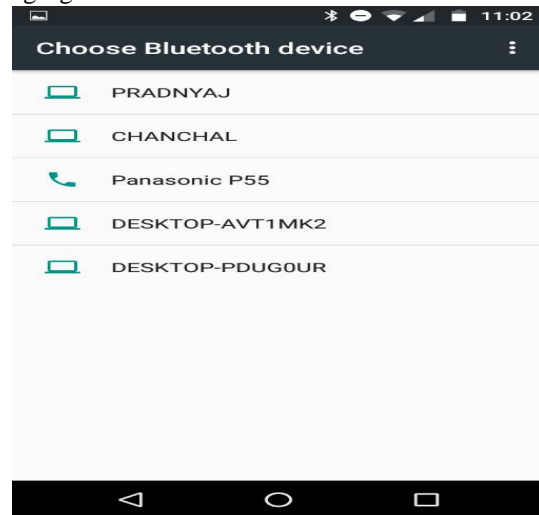
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Sending image via Bluetooth to the system is shown in following figures.



(e)



(f)

The path of image in system is shown in this figure.



(g)

VIII. APPLICATIONS

- **Security for bank lockers:**

Security of bank locker is salient for every user. Sometime user forgets to carry the locker key. In those cases it gets very difficult to access the bank locker. Main motto aback this project gives a secure system for lockers without using the keys. The QR code verification can do this work very efficiently.

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- **Military:**
Military personnel need to store equipment or personal belongings such as books, letters, clothes, care packages, and more. So that personnel have their own lockers. To give authentication for using this locker they can use this system.
- **Airline:**
In Airline, pilot and airhostess have their own lockers. To give authentication for using this locker they can use this system.

IX. CONCLUSION

Nowadays many people are live in the developed countries. So everyone likes to work mostly on the smart phones and laptops. For that security is most important factor. So we have developed a secure authentication system which is based on QR code. The fact that the user need not to carry any additional device (considering user would carry the Smartphone anyway) makes it more comfortable and easier. Also the Smart phones are now not that much costly so this application is very important, easy, and secure for banking security application.

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