



An Effective Technique For Generation And detection Of QR code

Miss. Usha R. pardhi
Scholar

Jawaharlal Darda Institute of Engg. & technology.
Yavatmal, India.
ushapardhi@gmail.com

Prof. Onkar V. Chandure
Assistant prof.

Jawaharlal Darda Institute of Engg. & technology.
Yavatmal, India.
onkar_chandure@yahoo.co.in

Miss. Priyanka S. Atal
Scholar

Jawaharlal Darda Institute of Engg. & technology.
Yavatmal, India.
priyankas.atal@gmail.com

Abstract: This paper focuses on the concept of QR code ie. Quick Response Code. It is used instead of bar code because it has more data holding capacity than bar code with high speed of detection and accuracy. Quick Response (QR) code has been widely used in the automatic identification fields. In order to adapting the various sizes, a little dirty or damaged, and various lighting condition of bar code image, this proposes a novel implementation of real time Quick Response code recognition which is an efficient technology used for data transferring.

QR code is 2D code which read data horizontally and vertically; stores alphanumeric characters. In order to adapting various sizes, various gray level values, and under various lighting conditions of real bar code image, a high speed, high accuracy. Mobile phones can be secure with generation and detection of QR code.

Keywords: QR code, generation, detection, encryption.

I. INTRODUCTION

The term Quick Response (QR) codes are versatile. A piece of long multilingual text, a linked URL, an automated SMS message, a business card or just about any information can be embedded into the two-dimensional QR code. Coupled with moderate equipped mobile devices, QR Codes can connect the users to the information quickly and easily [3]. We explore how QR codes can be used in education. The low technical barrier of creating and reading QR codes allows innovative educators to incorporate them into their educational endeavors. The operations to retrieve or store QR codes are incredibly simple and quick, and with mobile devices, make them the ideal educational tools for teaching and learning [2].

This paper proposes the use of QR code. Also discuss generation and detection of QR code. Here provides a module for encryption in order to make QR code more secure and safe [1].

A. Structure of QR code:-

The ISO/IEC standard 18004 defines the QR code symbol as having a general structure that comprises, besides data, version information, and error correction code words. QR code consists of following regions.

- Quiet zone around the symbol
- Finder patterns (FIP) in the corners
- Timing patterns (TP) between the finder patterns
- Alignment patterns (AP) inside the data area

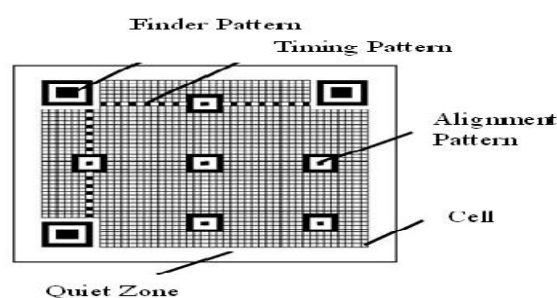


Figure 1: QR code structure

a. Finder Pattern:-

Finder Pattern is in the corner of structure. Finder Pattern can be used for detecting the position of QR Code. The position, size and angle of the QR Code can be determined with the help of the three position detection patterns (Finder Patterns) which are arranged at the upper left, upper right and lower left corners of the symbol. The patterns can be easily detected in all directions.

b. Alignment Pattern:-

The alignment pattern consists of dark 5x5 modules, light 3x3 modules and a single central dark module. This pattern is actually used for correcting the distortion of the symbol [5]. The central coordinate of the alignment pattern will be identified to correct the distortion of the symbol.

c. Timing Pattern:-

Timing pattern are between the alignment pattern. The timing patterns are arranged both in horizontal and vertical

directions. These are actually having size similar to one module of the QR Code symbol. This pattern is actually used for identifying the central co-ordinate of each cell with black and white patterns arranged alternately.

d. Quiet Zone :-

It is around the Symbol. This region is actually free of all the markings. The margin space is necessary for reading the bar code accurately. This zone is mainly meant for keeping the QR Code symbol separated from the external area [6]. This area is usually 4 modules wide.

e. Data Area :-

The data area consists of both data and error correction code words. According to the encoding rule, the data will be converted into 0's and 1's. These binary numbers will be then converted into black and white cells and will be arranged. Reed-Solomon error correction is also employed here [7].

B. Features of QR Code:-

QR code consist of 40 versions with four levels of error correction, and the maximum symbol size (the highest version) can encoding 7089 numeric data or 4296 alphanumeric data [4]. In addition to, QR Code has many advanced features:

- High Encoding capacity :- QR Code has high capacity encoding of data, its maximum symbol can encode 7089 characters; while PDF417 only encode 2710 characters.
- High reading speed:- It is adapted with CCD reading, it can recognize more QR Code symbol per second than PDF417symbol for encoding same data capacity.
- Readable from any direction from 360 degree QR Code is a matrix two-dimensional barcode; it can be readable from any direction from 360 degree.

C. Capacity and Error correction code:-

The capacity of a QR Code depends on several factors. It depends on version, error correction level, encoded data.

- Version: There 40 different versions of QR Codes differ in the number of modules. Version 1 consists of 21x21 modules, up to 133 (lowest error correction level).Version 1 used for storing encoded data. The largest QR Code i.e. Version 40 has a size of 177x177Modules. Version 40 can store up to 23,648 data modules.
- Error Correction Level: Error Correction in QR Codes is based on Reed-Solomon Codes [9], a specific form of BCH error correction codes [7,8]. There are four levels of error correction that can be chosen by the user at creation time.

Table 1: Error Correction Levels

L	7%
M	15%
Q	25%
H	30%

Encoded Data: QR Code can use different data encoding mode. They are

- Numeric mode:-**It encodes digits, hence able to pack a lot of data in one picture.
- Alphanumeric mode:-**It is set of characters containing upper case letters and some additional characters like \$ or whitespace).
- 8-bit mode:-** It is able to encode the JIS 8-bit character set (Latin and Kana) in accordance with JIS X 0201.
- Kanji characters:-** It shift JIS character set in accordance with JIS X 0208 Annex 1 Shift Coded Representation.

Their complexity influences the amount of actual characters that can be stored inside the code.

II. LITERATURE REVIEW AND RELATED WORK

The term “QR Code” is in reference to “Quick Response .It were developed in 1994 by Denso wave in Japan. QR Codes have already overtaken the conventional bar codes. Because of the capacity of barcode that holding data is very much less compared to the QR Code. QR Code contains data both in horizontal and vertical position. A typical barcode can only hold a maximum of 20 digits, whereas as QR Code can hold up to 7,089 characters [1]. QR Codes are capable of encoding the same amount of data in approximately one tenth the space of a traditional bar code. The code consists of black modules arranged in a square pattern with functions such as encoding, image searching, decollating, image allocation and image revision. A great feature of QR Codes is that they do not need to be scanned from one particular angle, as QR Codes can be read regardless of their positioning. QR Codes can be easily decoded with a mobile phone with appropriate software (Kaywa Reader) [2]. Secure communication can also be established using QR Encoding techniques [3]. QR Codes are now used in a much broader context, including both commercial tracking applications and convenience-oriented applications aimed at mobile phone users (known as mobile tagging).

An approach to the detection of QR code is used to people for detection of QR code. It also help visually impaired people identify objects using these QR code as tags. The use of QR codes in helping blind people identify objects is the problem addressed in. The aim of this work is to develop a method for detecting QR codes in arbitrarily acquired images. There not only detecting the presence of a code, but also in determining the size and position of a QR code symbol in an image, important for correctly framing them. In addition, detection should be fast to allow real-time applications. Finally detected code can be encrypted for providing security.

III. ANALYSIS OF PROBLEM

In this we are concentrate on the flaws related to the barcode technique & how it is overcome with QR code.Bar codes have low reading speed and accuracy. As bar codes became popular and their convenience universally recognized, the market began to call for codes capable of storing more information, more character types, and that could be printed in a smaller space.

As a result, various efforts were made to increase the amount of information stored by bar codes, such as increasing the number of bar code digits or layout multiple bar codes.

However, these improvements also caused problems such as enlarging the bar code area, complicating reading operations, and increasing printing cost. Conventional bar codes are capable of storing a maximum of approximately 20 digits, QR Code is capable of handling several dozen to several hundred times more information.

To solve the problem of low reading capacity and accuracy, QR code is developed. It has high encoding capacity with high reading speed and Code can be readable from any direction.

IV. PROPOSED WORK & OBJECTIVE

One particularly interesting use of QR code is to exchange public encryption key information. Public key encryption is a great way to obscure and protect the integrity of data exchanged over a non-secure medium. A classic problem, however, has been the integrity of the key exchange itself. Exchanging a public key on paper and in person is the most obvious and secures solution, however inefficient. The solution has been to use a trusted third party or Certificate Authority. This solution requires additional cost and more complexity, but is widely used in web transactions.

Now let's say you walk into an establishment and there is a QR code posted, or you meet a new business partner who has printed one on his business card. Among other interesting information for your device is Intent to store a message digest of that entity's public key. A message digests, because the full text of the key is too large for QR code. There may also be information to download the public key, o the key will be embedded in a signed APK file. The important thing is that you have transmitted information that allows you to verify the integrity of a public encryption key easily and over a secure medium (paper presented to you by the key's owner). Now you can trust that the key is valid, without having to go through a Certificate Authority. This paper proposes the use of public key encryption technique which allows safe transfer of data and it remains secure too.

V. CONCLUSION AND FUTURE WORK

In this paper, we have studied about Q-R code in which we can generate Q-R code & authenticate as well. It is very simple & efficient to use than bar code. As Q-R code is 2 dimensional so that information storing capacity is much higher than bar code & we propose public encryption for security. As future work we the detect the QR code to find actual information hidden inside the QR Code & Then encrypt that code for providing security.

VI. REFERENCES

- [1]. Peter Kieseberg, Manuel Leithner, Martin Mulazzani, Lindsay Munroe, Sebastian Schrittwieser, Mayank Sinha, Edgar WeipplT. J., "QR Code Security"
- [2]. Tasos Falas, Hossein Kashani, "Two-Dimensional Bar-code Decoding with Camera-Equipped Mobile Phones", Proceedings of the Fifth Annual IEEE International Conference on Pervasive Computing and Communications Workshops(PerComW'07) 0-7695-2788-4/07 \$20.00 © 2007
- [3]. William Claycomb, Dongwan Shin, "Using A Two Dimensional Colorized Barcode Solution for Authentication in Pervasive Computing", 1-4244-0237-9/06/\$20.00 ©2006 IEEE
- [4]. ISO/IEC 18004:2000. Information technology-Automatic identification and data capture techniques-Bar code Symbology- QR Code, 2000.
- [5]. ISO/IEC 18004:2000 Information Technology -Automatic Identification and Data Capture Techniques –Barcode Symbology- QR Code (MOD), June 2000.
- [6]. Sarah Lyons and Frank R. Kschischang, "Two-Dimensional Barcodes for Mobile Phones", 25th Biennial Symposium on Communications, 978-1-4244-5711-3/10/\$26.00 ©2010
- [7]. R. Bose and D. Ray Chaudhuri. On a class of error correcting binary group codes*. Information and control, 3(1):68{79, 1960.
- [8]. A. Hocquenghem. Codes correcteurs 2(147-156):4, 1959.
- [9]. I. Reed and G. Solomon. Polynomial codes over certain finite fields. Journal of the Society for Industrial and Applied Mathematics, 8(2):300{304, 1960