A Review of QR code Structure for Encryption and Decryption Process

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ABSTRACT: In the recent time, barcodes are using to encode more data per area unit in black and white barcodes. A barcode is a collection of bars and spaces which ordered as rules set. It shows that how information is to be presented. In 2D Barcode data Stored in a non-linear way. These types of codes called two-dimensional code. Here different applications are discussing in brief and also mention the structure, symbology, and properties of barcodes. This research paper deals to give QR barcodes with the help of document software like ms-word document 2007/2010. The main achievement of the paper is to accomplish creation and understanding the technology of QR code in today's environment.

Keywords: QR code; strokescribe.

I. INTRODUCTION

QR (Quick Response) codes are 2-D based bar codes. It can hold any alphanumerical text, and it holds the data in binary form. Data can be in only in numeric form, Kanji format, and URLs based that redirect users to a website. Decoding software tools like iPhones camera, tablet interprets the codes, which show more data as the comparison to a one-dimensional system of the same size. The QR codes are found in various locations like buildings, product labels, billboards, and inviting passers-by to pull out their mobile phones, uncover the encoded data. QR Codes can allow tracking data for products, routing information on a mailing label, or contact data on a business card. QR codes are Small in size. The code design can be hidden or merged into a newspapers, magazines, or clothing. QR Code (Quick Response Code) is the trademark for a type of matrix barcode (or two-dimensional code). In this first design is using for the automotive industry. In the present time, these QR codes are getting popular outside the industry because it is fast readability and big storage capability as compare to standard UPC barcodes. QR code consists black modules (square dots) which are fixed up in a square pattern on a white background. The data encoded can be made up of four standardized kinds ("modes") of information (numeric, alphanumeric, byte/binary, Kanji), or by supported extensions, virtually any type of information. The previous type of Barcode was configured mechanically, and it scanned by a specify beam of light, the QR code is noticed as a 2-dimensional digital image by a semiconductor image sensor and is then digitally examined by a programming based processor. The processor provides the three typical squares at the every corner of the image, and normalize image size, orientation, and angle of seeing. The small dots are then changed to binary numbers and validity checked with an error-correcting code [3] [5] [6][11][12].

II. LITERATURE SURVEY

QR Code is a matrix based symbology which is consisting an array of nominally square modules which are ordered in an entire square pattern with including a particular finder pattern which located at three corners of the symbol and intended to assist in the secure location of its position, size, and inclination. A broad range of symbol sizes provides four levels of error correction. Module attributes are user-specified which are using to enable symbol output with a broad variety of methods. QR Code Model is the creative specification of QR Code. QR Code Model is an increased form of the symbology with added features and it can be auto-discriminated from another Model. QR model is the suggested model for the application of the new and open system of QR Code.

III. OBJECTIVE

Accordingly, QR codes are a good way to add the practical and useful content at the time of need, and it's storage capability accommodates a different variety of information beyond numbers which including Hyperlink, Text, Telephone number (Phone call), Email (Send message), SMS/MMS message, etc. The primary target of the research paper is to increase the QR code awareness and find the benchmarking of the various codes. Implementation of the QR code can be done with the help of ms word 2007. QR codes can use also for educational purpose and several other criteria like marketing, medical, finance, and information about various products which containing less space in QR Codes.

IV. QR CODE STRUCTURE

QR Code is a matrix based symbol with a cell structure which is formatted in a square. It holds the functionality designs for reading easy and the stored data area also. QR Code has discovered designs, alignment designs, timing designs, and a quiet zone [1].
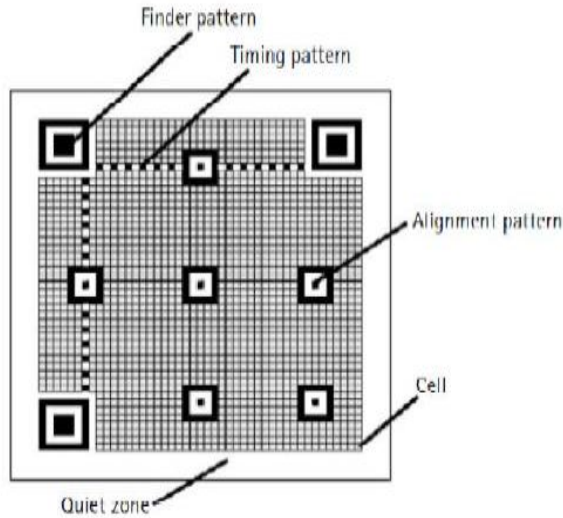
Fig. 1. QR Code Structure

A. Finder Pattern

A model for detection the location of the QR Code. By ordering this design at the three corners of a symbol, position, size, and angle of the symbol can be observed. This type of pattern consist a structure which can be Observed in all directions (360°).

B. Alignment Pattern

A model for adjusting the distortion of the QR Code. It is highly efficient for adjusting nonlinear distortions. The central coordinate of the alinement pattern will be discovered to correct the distortion of the symbol. For this purpose, an isolated black cell is directed in the conjunction pattern for getting it easy to detect the central coordinate of the alignment pattern.

C. Timing Pattern

A model for discovering the central coordinate of each cell in the QR Code with black and white designs and set alternately. It is using to correct the central coordinate of the information cell when the symbol is distorted or when there is an error for the cell pitch. It is fixed up in both vertical and horizontal directions.

D. Quiet Zone

A margin space essential for scanning the QR Code. This quiet zone gets it easier for symbol detection from among the image which is the record by the CCD sensor. Four or more cells are essential for the quiet area.

E. Data Area

The QR Code information will be stored (encoded) into the information area. The gray part in QR code shows the information area. The information will be encoded into the binary numbers of '0' and '1' which are based on the encoding rule. The binary numbers of '0' and '1' will be changed into black and white cells and then will be fixed up. The information area will have Reed-Solomon codes incorporated for the stored data and the error correction functionality.

V.   WORKING OF QR CODE

The process of decoding, scanning and reading out of a 2D barcode accomplish by using a camera phone which is called mobile tagging. For reading a QR code, user has to use a QR code scanner. These scanners come built into different camera-enabled mobile phones, and third-party scanner applications can download for any smartphone. After taking an image of a QR code, the application processes of the QR code start and it converts into readable text. The code can hold contact information or an URL of a company's website. To produce a meaningful and interactional customer experience, QR codes can be programmed for startup applications like as web browsers, IM, SMS, email and even streaming video [2].
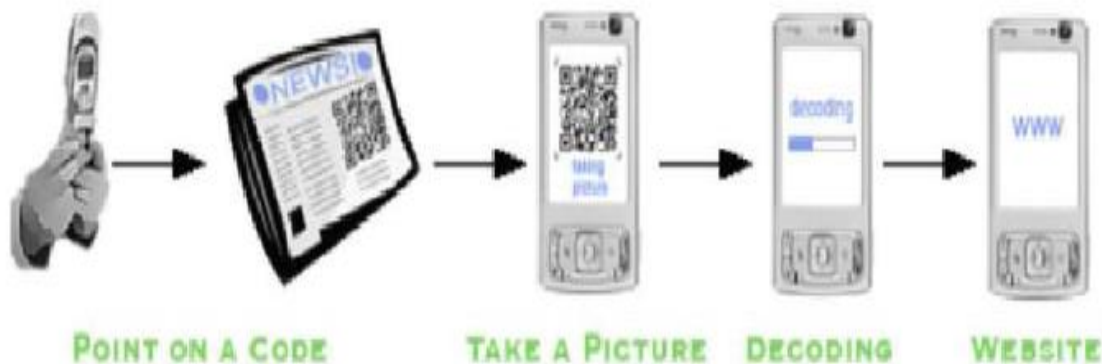

Fig.2. Overview of How QR code works

VI. VARIATIONS OF QR CODES

In the Figure 3 , we shows some major differences in 1D and 2D bar codes.

Fig.3. Variations of codes

VII. APPLICATIONS OF QR CODE

QR Codes are using over a wide range of applications as shown in fig.4, including Vcard data, tattoo, object tracking in Courier, Ticket Booking, entertainment and transport ticket, product/loyalty marketing, and in-store product labeling. It can also be in use for holding personal data for use by the government. Many of these applications are based on mobile-phone users (via mobile tagging). Users will receive text, add a vCard contact to their device, open a Uniform Resource Identifier (URI), or compose an e-mail or text message after scanning QR Codes. They will give and mark their personal QR Codes for other people to read and apply by visiting one of several pay or free QR Code generating sites or apps that shown as in fig.4 [8] [9] [10].

Fig.4. Generators and reader software
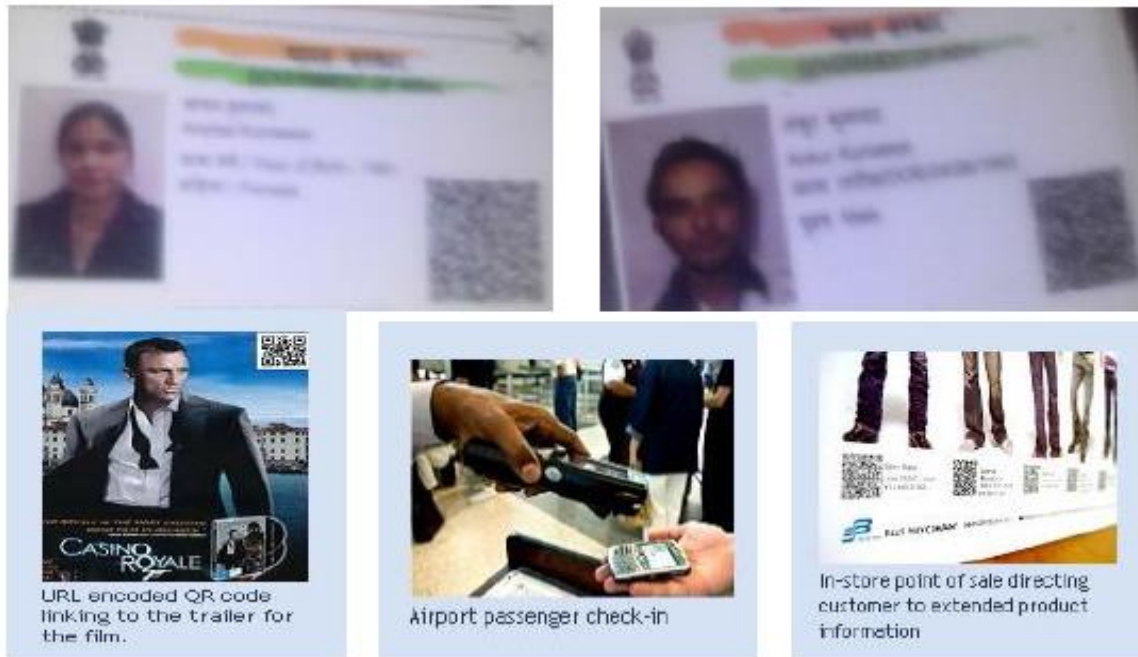

Fig.5. Applications of QR code (i)

Fig.5. Applications of QR code

VIII. METHODOLOGIES

As we show in this research paper, we must have stroke scribe as well as QR code or Barcode Scanner to check its available data. After this, we can use the below steps to get QR Code by Microsoft Word 2007.We can also save up this QR code image on our disk.

Step 1. First of all, start Microsoft Word 2007 applying Start button->All Programs menu.

Step 2. By insert tab, find text tool group and then choose Object option.

Step 3. In the Insert Object dialog, select stroke scribe Document option from the object type list such as shown in fig.6.
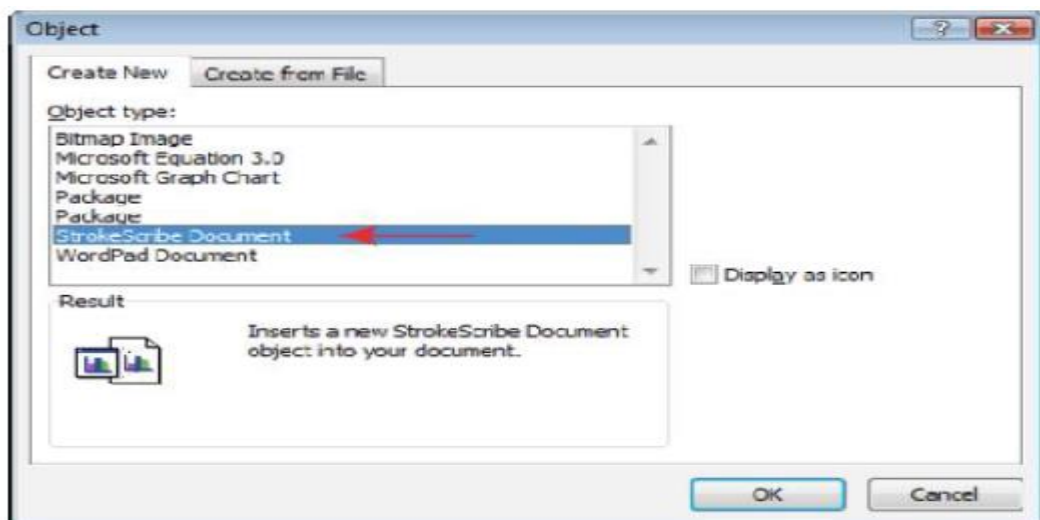

Fig.6. Stroke scribe document from Insert tab

Step 4. After step 3 by default, the following bar code will be shown as in fig.7.

Fig.7. Barcode Image

Step 5. Perform Right-click event on the barcode picture to open the context menu to choose the StrokeScribe Control then from next pop up select properties option. The way as shown in fig.8.

Fig.8. Way of choosing Properties of stroke scribe control object of barcode

Step 6. Select the barcode type and adjust barcode property that we want as shown in below fig.9.we can change the text, color, rotation, code type i.e. alphabet.
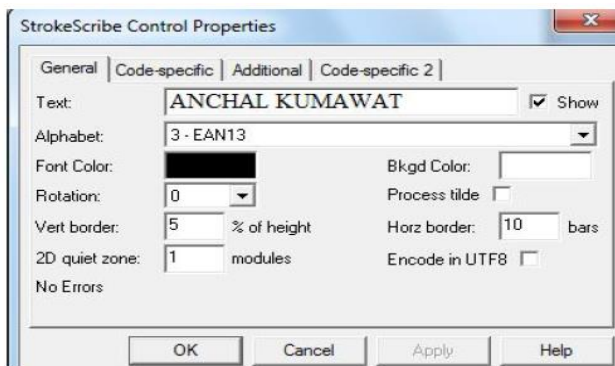

Fig.9. Properties of stroke scribe control object

Step 7. To generate QR code then select QR code Property from alphabate option. Instead of QR code we can make several codes by selecting properties of object such as in fig.10.
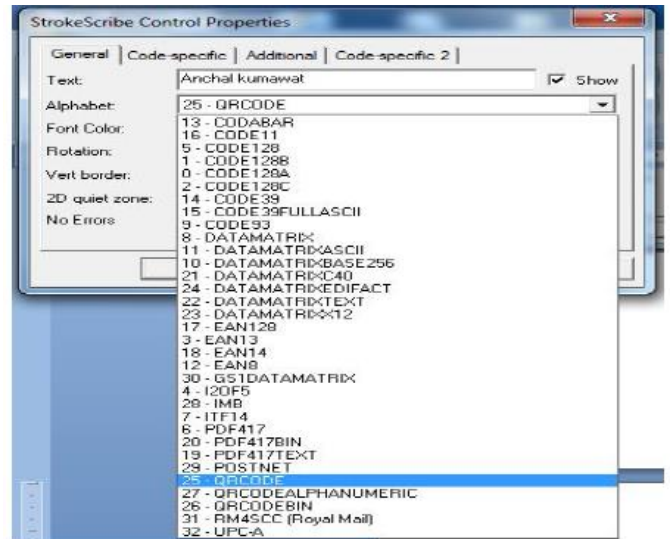

Fig 10. QR code Property

Step 8. Finally, we can get QR code of our generating text such shown as in fig.11.
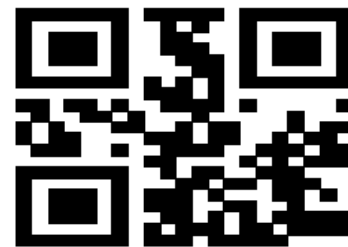

Fig.11. Resultant QR code of text

IX. CONCLUSION

This research paper study that generation of a QR code with the help of document-based software. A common user can get own QR code of their text in a user-friendly environment of word and a user may get for this by following above steps which are mention in this research paper. To scan Fig 11 QR code by different iPhones reader like scan life ,bee tagg and so on and desktop readers like Quick Mark and Zxing decoder and then information will be displayed on user's iphone or desktop.

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