IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

The Evoluation Of QR Code In ModernLiving

Prof. D. B. Dandekar*[1], Shubham Palange*[2], Tejas Nyaykhor*[3], PranayKamble*[4], Mukund Bhoyar*[5],Darshana Gondane*[6]

*[1] Prof., Department of Computer Science & Engineering, SSPACE,Wardha, Maharashtra, India.
*[2,3,4,5,] Student, Department of computer Science & Engineering, SSPACE , Wardha,Maharashtra, India.

ABSTRACT

Before we delve into the history of a QR Code, let's make sure it's clear what a QR Code is. A QR Code, or quick response Code, is a Code that is quickly readable by a cell phone (hence the word "quick" in the name). Using a combination of spacing as a type of Matrix Barcode (a 2-D Barcode), when a QR Code is scanned, it conveys a wide multitude of information. QR Codes have a wide range of uses across all types of industries such as retail, marketing, and logistics. A barcode, consisting of bars and spaces, is a machine- readable representation of numerals and characters. Today, stripes as shown below on packages of products sold at supermarkets, convenience stores and other stores are ubiquitous. These
are barcodes. A barcode consists of bars and spaces of varying width that can be read with an optical barcode scanner. While QR Codes and Barcodes are similar in practice, QR Codes contain more information because they have the ability to hold information both horizontally and vertically. Barcodes only use horizontal information. While Barcodes work wonderfully for situations like scanning supermarket items, QR Codes have a much higher capability of transferring information, likely what has made them increasingly popular due to their versatility.

I. INTRODUCTION

A Quick Response Code also known as QR code is a two-dimensional type of barcode that Denso Wave develops, a Japanese barcode developer, in 1994. QR codes are scan-able using smartphones devices, which are natively developed to scan/detect QR codes. These codes are generated using an online QR code generator that displays online information to the scanner when scanned.Today, QR codes are generally used in advertising, business, health care, and education. However, business sectors, especially in the advertising and operations, most widely use QR codes. Aside from these sectors, the restaurant industry also employs an interactive restaurant menu QR code software and QR code generators to generate menu QR code for their business. You can find QR codes in brochures, flyers, posters, billboards, items and products, business cards, and even online websites such as social media and shopping sites. QR codes have become common in consumer advertising. Typically, a smartphone is used as a QR code scanner, displaying the code and converting it to someuseful form (such as a standard URL for a website, thereby obviating the need for a user to type it into a web browser). QRcode has become a focus of advertising strategy, since it provides a way to access a brand's website more quickly than by manually entering a URL .Beyond mere convenience to the consumer, the importance of this capability is that it increasesthe conversion rate: the chance that contact with the advertisement will convert to a sale. It coaxes interested prospects further down the conversion funnel with little delay or effort, bringing the viewer to the advertiser's website immediately, whereas a longer and more targeted sales pitch may lose the viewer's interest. Although initially

used to track parts in vehicle manufacturing, QR codes are used over a much wider range of applications. These include commercial tracking, entertainment and transport ticketing, product and loyalty marketing and in-store product labeling.Examples of marketing include where a company's discounted and percent discount can be captured using a QR code decoder which is a mobile app, or storing a company's information such as address and related information alongside its alpha-numeric text data as can be seen in Yellow Pages directories. They can also be used in storing personal information for use by organizations. An example of this is Philippines National Bureau of Investigation (NBI) where NBI clearances now come with a QR code. Many of these applications target mobile-phone users (via mobile tagging).

Users may receive text, add a vCard contact to their device, open a URL, or compose an e-mail or text message after scanning QR codes. They can generate and print their own QR codes for others to scan and use by visiting one of several pay or free QR code- generating sites or apps. Google had an API, now deprecated, to generate QR codes, and apps for scanning QR codes can be found on nearly all smartphone devices. Barcode or bar code is a method of representing data in a visual, machine-readable form. Initially, barcodes represented data by varying the widths, spacings and sizes of parallel lines. These barcodes, now commonly referred to as linear or one- dimensional (1D), can be scanned by special optical scanners, called barcode readers, of which there are several types. Later, two-dimensional (2D) variants were developed, using rectangles, dots, hexagons and other patterns, called matrix codes or 2D barcodes, although they do not use bars as such. 2D barcodes can be read using purpose-built 2D optical scanners, which exist in a few different forms. 2D barcodes can also be read by a digital camera connected to a running software that takes a photographic image of the barcode and analyzes the image to deconstruct and decode the 2D barcode.

LITERATURE REVIEW

QR i.e. "Quick Response" code is a 2D matrix code that is designed by keeping two points under consideration, i.e. it must store large amount of data as compared to 1D barcodes and it must be decoded at high speed using any handheld device like phones. QR code provides high data storage capacity, fast canning, omnidirectional readability, and many other advantages including, error-correction (so that damaged code can also be read successfully) and different type of versions. Different varieties of QR code symbols like logo QR code, encrypted QR code, QR Code are also available so that user can choose among them according to their need. Now these days, a QR code is applied in different application streams related to marketing, security, academics etc. and gain popularity at a really high pace. Day by day more people are getting aware of this technology and use it accordingly. The popularity of QR code grows rapidly with the growth of smartphone users and thus the QR code is rapidly arriving at high levels of acceptance worldwide. This software creates barcodes that can be printed and read on any product. Integrating scanners are able to scan and analyse the information stored within these barcodes. Barcodes are typically scanned when products are sold or shipped from one location to another. Different industries and countries use different formats for barcodes, depending on their specific needs. Barcode software should offer various templates so users can
print whichever format of barcode will fit a business need. These solutions are typically used in industries such as manufacturing and e-commerce.

QR i.e. "Quick Response" code is a 2D matrix code that is designed by keeping two points under consideration, i.e. it must store large amount of data as compared to 1D barcodes and it must be decoded at high speed using any handheld device like phones. QR code provides high data storage capacity, fast canning, omnidirectional readability, and many other advantages including, error-correction (so that damaged code can also be read successfully) and different type of versions. Different varieties of QR code symbols like logo QR code, encrypted QR code, QR Code are also available so that user can choose among them according to their need. Now these days, a QR code is applied in different application streams related to marketing, security, academics etc. and gain popularity at a really high pace. Day by day more people are getting aware of this technology and use it accordingly. The popularity of QR code grows rapidly with the growth of smartphone users and thus the QR code is rapidly arriving at high levels of acceptance worldwide. This software creates barcodes that can be printed and read on any product. Integrating scanners

are able to scan and analyse the information stored within these barcodes. Barcodes are typically scanned when products are sold or shipped from one location to another. Different industries and countries use different formats for barcodes, depending on their specific needs. Barcode software should offervarious templates so users can print whichever format of barcode will fit a business need. These solutions are typically used in industries such as manufacturing and e-commerce.

METHODOLOGY

Scientific research has been playing an important role in the progress and enrichment of new age technology. Research is invention or scientific investigation or scientific enquiry to extract truth or invent new concepts by scientific way. Descriptive research consists of fact-finding enquiries and surveys of various kinds. The main motive of descriptive analysisis explanation of the state of affairs as it currently exists. Research can be either applied to study or to fundamental studies. The objective of applied analysis is to find a solution to an instant issue facing a community or an industrial/business organization, whereas basic study is primarily worried with generalizations and the formulation of a theory.

Quantitative research is based on quantity or quantity measurements. It applies to events that can be stated in quantity terms. On the other side, qualitative research is concerned with the phenomenon of quality. Conceptual study involves some theory or abstract ideas. Theorist and thinkers typically use it to develop fresh thoughts or reinterpret current ones. However, inquiryrelies on knowledge or examination alone, often without proper scheme and theory consideration. It is data-based study, resulting in judgments that can be checked through observation or experimentation. We did QR Code analysis with the assistance of all these techniques.

SYSTEM ARCHITECTURE

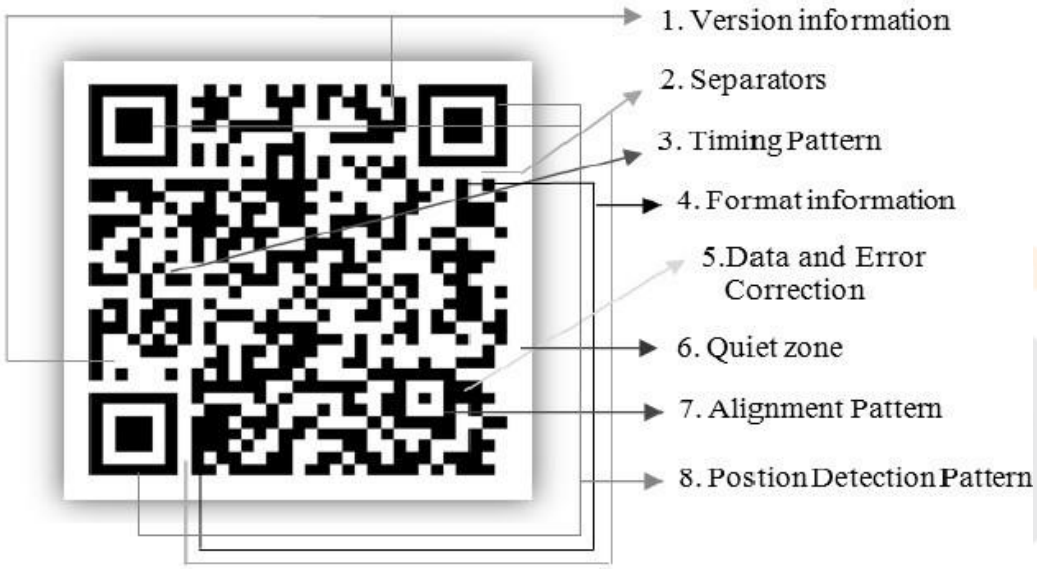


Figure: Structure Of The Evoluation Of QR Code In Modern Living

Finder Pattern (1): The finder pattern comprises of three identical structures that are situated in all corners of the QR Code except the bottom right one. Each pattern is based on a black module matrix of 3x3 encircled by white modules that are againsurrounded by black modules. The Finder Patterns allows the decoder software to identify the QR Code and determine the exact orientation.

Separators (2): The white separators have a width of one pixel and boost the recognition of the Finder Patterns as they isolate them from the actual data.

Timing Pattern (3): In the Timing Pattern, alternating black and white modules allows the decoder software to determine a single module‘s width.

Alignment Patterns (4): Alignment Patterns helps to reimburse the decoder software for mild picture deformation. Version 1 QR codes have no Alignment Patterns. With increased code size, more Alignment Patterns are added.

Format Information (5): The Formation Information section is made up of 15 bits next to the separators and stores data about the QR code error correction rate and the masking model selected.

Data (6): Data is converted into a bit stream and then stored in information segment in 8 bits sections (known as codewords).

Error Correction (7): Similar to the data section, error correction codes are stored in 8 bits long code-words in the error correction section.

Remainder Bits (8): This section consists of empty bits, if data and error correction bits cannot be split into 8 bit codewords without remainder. To enhance code recognition by the decoder software, the entire QR code must be encircled by the so called Quiet Zone, an area in the identical color shade as white modules.

REQUIREMENT

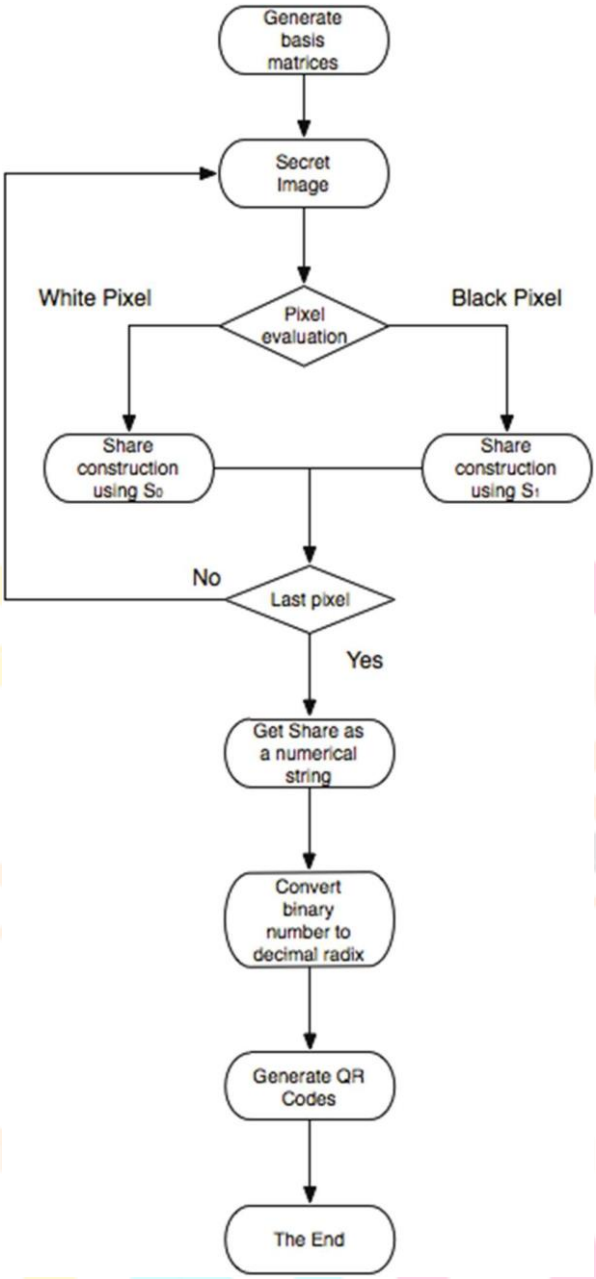
Hardware Requirements:

Dual core x86-64 CPU with 2.0GHz or faster. 4 GB of system memory GPU

Software Requirements:

- python-3.8.0-amd64
- JetBrains PyCharm Professional 2023.1

BLOCK DIAGRAM OF QR CODE



IMPLEMENTATION

SOURCE CODE:

```
python -m tkinter
pip install qrcode[pil]

import tkinter as tkimport qrcode
from PIL import Image, ImageTk

class QRCodeGeneratorApp:

    def __init_(self, root):self.root = root
        self.root.title("QR Code Generator")

        self.url_label = tk.Label(root, text="Enter Website URL:")self.url_label.pack()

        self.url_entry = tk.Entry(root)self.url_entry.pack()

        self.generate_button = tk.Button(root, text="Generate", command=self.generate_qr_code)self.generate_button.pack()

        self.qr_code_label = tk.Label(root)self.qr_code_label.pack()

    def generate_qr_code(self):url = self.url_entry.get() if url:
            qr = qrcode.QRCode(version=1,
                error_correction=qrcode.constants.ERROR_CORRECT_L, box_size=10,
                border=4,
            )
            qr.add_data(url) qr.make(fit=True)
            qr_image = qr.make_image(fill_color="black", back_color="white")

            # Convert the QR code image to a format compatible with tkinterqr_photo = ImageTk.PhotoImage(qr_image)

            self.qr_code_label.config(image=qr_photo) self.qr_code_label.image = qr_photo
        else:
            self.qr_code_label.config(text="Please enter a valid URL.")

if __name____== "__main_":root = tk.Tk()
    app = QRCodeGeneratorApp(root)root.mainloop()
```

RESULT

Figure: Output Of The Evoluation Of QR Code In Modern Living

SCOPE OF A PROJECT

Omnidirectional and Fast Scanning: QR code can be read much faster and within 360 degrees can be scannedfrom any angle i.e. no need to place the scanner as per the code symbol.

Small Size: QR code takes less space. A QR Code can hold the same volume of information contained in a 1-D barcode in only one-tenth the space.Huge Data Storage Capacity: QR code has high data storage capacity. A single QR Code token can store up to 7,089 numerals (200 times the volume of information storage capacity of the traditional 1-D barcode) Many Types of Data: The QR Code can handle numerals, alphanumeric characters, Japanese, Chinese or Korean letters and binary data.Error correction: Error correction technique used in QR codes enables successful decoding of the code symbol even if up to 30% of the data is dirty or damaged.Available for Everyone: Anyone can make their own QR code according to theirneed, for example, user can create QR code of the URL of its own website for advertising purpose.

Wide Range of Uses: There are lots of potential uses of QR codes. They can be implemented to extend the user experience in store, restaurants, websites and more. 4.2 Although QR code has many positive points onits side but, there are some demerits of the QR code too, such as, Need of QR code scanner; to decode the code users must have a QR reader app, which limits the audience; Security issues, the scanner never really knows where the code is going to lead the user before scanning a QR code; Lack of public awareness, large portion of population is still unaware of this technology.

PROPOSED METHODOLOGY

Scientific research has been playing an important role in the progress and enrichment of new age technology. Research is invention or scientific investigation or scientific enquiry to extract truth or invent new concepts by scientific way.

Descriptive research consists of fact-finding enquiries and surveys of various kinds. The main motive of descriptive analysis is explanation of the state of affairs as it currently exists. Research can be either applied to study or to fundamental studies. The objective of applied analysis is to find a solution to an instant issue facing acommunity or an industrial/business organization, whereas basic study is primarily worried with generalizationsand the formulation of a theory.

Quantitative research is based on quantity or quantity measurements. It applies to events that can be stated in quantity terms. On the other side, qualitative research is concerned with the phenomenon of quality. Conceptual study involves some theory or abstract ideas. Theorist and thinkers typically use it to develop fresh thoughts or reinterpret current ones. However, inquiry relies on knowledge or examination alone, often without proper scheme and theory consideration. It is data-based study, resulting in judgments that can be checked through observation or experimentation. We did QR Code analysis with the assistance of all these techniques.

CONCLUSION

We have discussed about the analysis of QR codes as well as their applications. The capacity of these codes to store data is very high plus they are damage resistance which makes them overcome one of the key concerns of security. In the past decade or so, the application of QR codes in public domains like supermarkets and in educational purposes like book scanning or stationary scanning has been increased rapidly and it will continue to thrive in more fields as the awareness will increase. The QR code technique is getting popular day byday and at the same time it is becoming increasingly secure as the technology is enhancing. Once, the awarenessabout these codes increases, it will get a wide spectrum to evaluate its significance. In near future, this technologywill be used in wide public domains. Firstly, QR codes were used to store the information about inventory products but nowadays it is being used in the huge industries like marketing, secure payment systems, advertising, education systems etc.

REFERENCES

1) Phaisarn Sutheebanjard, Wichian Premchaiswadi QR-Code Generator.
2) Roberts, Sam (11 December 2019). "George Laurer, Who Developed the Bar Code, Is Dead at 94". TheNew York Times. Retrieved 13 December 2019.
3) Joe Waters. "How to Use the Top QR Code Generators". Dummies.com. Archived from the original on11 September 2017. Retrieved 5 June 2017.
4) Jenny Lee (4 January 2012). "Tesco's cool QR code advertising campaign". Archived from the originalon 3 June 2016. Retrieved 26 May 2016.
5) David, H (28 November 2018), "Barcodes – Validation vs Verification in GS1", Labeling News,retrieved 6 June 2020.
6) “What about barcodes and 666: The Mark of the Beast?". Av1611.org. 1999. Retrieved 14 March 2014.
7) "2D Color Barcodes for Mobile Phones" (PDF). Archived from the original (PDF) on 4 March 2016.