VIVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELAGAVI – 590 018, KARNATAKA

DIGITAL IMAGE PROCESSING MINI PROJECT

ON

"QR CODE GENERATION"

Submitted By

NAME:	NAME:
PRAGNASHRI G	VAISHNAVI J INAMDAR
USN: 1VK20AI016	USN: 1VK20AI027

Submitted in the partial fulfillment of the requirements for award of degree(18AIL67)

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ENGINEERING

Janatha Education Society®

VIVEKANANDA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ARTIFICIAL INTELLEGENCE AND MACHINE LEARNING ENGINEERING

GUDIMAVU, KUMBALAGODU POST, KENGERI HOBLI, BENGALURU –560074

2022-2023

Janatha Education Society®

VIVEKANANDA INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ENGINEERING

CERTIFICATE

This is to certify that the Mini project work entitled **"QR CODE GENERATION"** carried out by **PRAGNASHRI G** bearing the **USN: 1VK20AI016** and **VAISHNAVI J INAMDAR** bearing the **USN: 1VK20AI027** are bonafide students of **Vivekananda Institute of Technology**, **Bangalore** in partial fulfillment of the requirements for the sixth semester **DIGITAL IMAGE PROCESSING LABORATORY WITH MINI PROJECT** (**18AIL67)** of **Bachelor of Engineering** in **ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING** of the Visveswaraya Technological University, Belagavi during the year 2022-23. The mini project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said degree.

Signature of the Guide	Signature of the HOD	Signature of the Principal
Ms. Jamuna H G	**Dr. G P Pavan**	**Dr. D V Chandrashekar**
Asst. Professor, Dept. of AI&ML	Prof. & Head, Dept. Of AI&ML	Principal
VKIT, Bangalore	VKIT, Bangalore	VKIT, Bangalore

External Viva-Voce

Name of the Examiners:

Signature with date:

_____   _____

_____   _____

ACKNOWLEDGEMENT

It gives us immense pleasure to write an acknowledgement to this mini project, a contribution of all people who helped me realize it.

We are very thankful to our Principal, **Dr. D V Chandrashekar, VKIT**, Bangalore, for being kind enough to provide us with an opportunity to work on a project in this institution.

We would like to convey our heartfelt thanks to our beloved HOD, **Dr. G P Pavan, Department of ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING,** VKIT**,** Bangalore for giving us the opportunity to embark on this topic.

We would like to sincerely thank our project guide **Ms. Jamuna H G, Asst. Professor, Dept. of Artificial intelligence and machine learning engineering** for their valuable guidance, constant assistance, support and constructive suggestions for the betterment of the project, without which this project would have not been possible.

Finally, it is a pleasure and happiness to have the friendly co-operation shown by all the staff of **ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING** Engineering.

PRAGNASHRI.G

VAISHNAVI J INAMDAR

i

ABSTRACT

→ QR i.e." Quick Response" law is a 2D matrix law that's designed by keeping two points under consideration, i.e.it must store large quantities of data as compared to 1D barcodes and it must be decrypted at high-speed using any handheld device like phones.

→ QR law provides high data storehouse capacity, fast scanning, omnidirectional readability, and numerous other advantages including error- correction (so that damaged law can also be read successfully) and different types of performances.

→ Different kinds of QR law symbols like totem QR law, translated QR law, QR Code are also available so that the user can choose among them according to their need.

→ Currently, QR law is applied in different operation aqueducts related to marketing, security, academics etc. and gain fashion ability at a really high pace.

→ Day by day more people are getting apprehensive of this technology and use it consequently.

→ The fashion ability of QR law grows fleetly with the growth of smartphone druggies and therefore the QR law is fleetly arriving

→ at high situations of acceptance worldwide.

→ The fashion ability of QR code grows fleetly with the growth of smartphone druggies and therefore the QR law is hastily arriving at high situations of acceptance worldwide.

→ With the wide perpetration of QR law, the protection point of QR law is serious, like data leakage and data revision.

→ This paper emphasizes the analysis of QR law and its applications. This platform could be used by different security heart associations. Text lines or word system could be translated into QR Code and be read by a mobile device, etc. The work is achieved by the use of python beaker frame which is the main interface for generating the QR Canons.

TABLE CONTENTS

5. SYSTEM IMPLEMENTATION

   5.1 Program Code

6. SCREENSHOTS

Figure 6.1: QR code generator
Figure 6.2: Generated QR code

7. CONCLUSION AND FUTURE SCOPE

   7.1 Conclusion

   7.2 Future work

8.BIBILOGRAPHY

ABBREVIATIONS

Pd	pandas	import pandas as pd
Np	numpy	import matplotlib.pyplot as plt
Plt	matplotlib	import matplotlib.pyplot as plt
Px	plotly	import plotly.express as px
Go	plotly	import plotly.graph_objects as go
Sn	seaborn	import seaborn as sns
Tt	theano.tensor	import theano.tensor as tt
Tf	theano.tensor	import tensorflow as tf
Pk	pickle	import pickle as pkl
Dt	datetime	import datetime as dt
Tk	tkinter	import tkinter as tk
Mp	multiprocessing	import multiprocessing as mp
Dpg	dearpygui	import dearpygui.dearpygui as dpg
Xr	xarray	import xarray as xr
Nb	numpy	import numba as nb

Chapter 1

INTRODUCTION

Digital image processing is concerned with processing of an image. Image processing is a method to perform operations on images like enhancing images, extracting text from image, detecting edge of image

and many other operations. In digital image processing we take an image and convert that image in different forms. Like if we take color image we can convert it into grey image. In this both the input and output is an image. Usually Image Processing system includes treating images as two dimensional signals

while applying already set signal processing methods to them.

Today, its is rapidly growing technology. It forms core research area within engineering and

computer science disciplines too. Image processing has its wide applications in robotics, machine

learning, neural networking, signal processing, medical field, graphics and animations and in

many other fields.

1.1 IDENTIFICATION OF RELEVANT CONTEMPORARY ISSUES

Quick Response(QR) canons are protean. A piece of long multilingual textbook, a linked URL,

an automated SMS communication, a business card or just about any information can be

bedded int the two- dimensional barcode. Coupled with moderate equipped mobile bias, QR

Canons can connect the druggies to the information snappily and fluently. In this paper, we

explore how QR canons can be used in education. The low specialized hedge of creating and

reading QR canons allows innovative preceptors to incorporate them into their educational

endeavors.

The operations to recoup or store QR canons are incredibly simple and quick, and with mobile

bias, make them the ideal educational tools for tutoring and literacy. Now mobile phones can apply numerous new kinds of operations similar as taking prints, and movie firing by using bedded camera bias. So mobile phones with bedded camera bias can be used to fete the barcode.

This design proposes the use of QR canons more innovatively by planting colorful modules for colorful purposes. It also provides a module for encryption in order to make QR law more secure and safe. moment, much all tasks are done digitally. With smartphones in our triumphs, the whole world is nearly at our fritters.

We're developing a Python operation programme for QR Code generation. Python may be a programme that makes our law likewise as reading QR Canons bestowed on several websites or software.

The pyqrcode module is a QR law creator that's simple to use and written in pure python. The module is compatible with Python2.6,2.7, and3.x. The module automates utmost of the structure process for you. Generally, QR codes can be created using only two lines of law! Unlike numerous other creators, all of the robotization can be controlled manually. You're free to set any or all of the parcels of your QR law.

1.2 IDENTIFICATION OF PROBLEM

You must take a screenshot of the region wherever the QR Code is visible once it opens in screen prisoner mode. The information is shown as a Communication if the QR Code is licit.

This system is created to be employed effectively. By handling the stoner's repetitious duties

and delivering data and on- line bill payments, this package will increase stoner productivity.

mistreatment Python to come up with QR canons may be a fantastic tool.

Although originally used to track corridor in vehicle manufacturing, QR canons are used over

a important wider range of operations. These include marketable shadowing, entertainment

and transport marking, product and fidelity marketing and in- store product labeling.

The work is achieved by the use of python beaker frame which is the main interface for

generating the QR Canons. The system will have a login access point to help unauthorized

stoner to have access to the QR law generating session. They induce QR Code one after the

other in other to store the translated string into SQLite Database Models.

 On the other hand, a mobile QR law scanner makes it easier to use mobile

operation to identify the translated law.

This work has introduced a Quick Response(QR) law creator with Mobile overlook operation

for Mobile Network Recharge Operations.

.

Chapter 2

HARDWARE AND SOFTWARE REQUIREMENTS

2.1 PROBLEM DEFINITION

The quiet zone that distinguishes the QR Code from the surroundings is too small or absent, so the QR Code can't be read. Because the design has left out the quiet zone, the scanner can't determine what's the graphic and what's the QR Code. The further data that you add to a QR Code, the lower those pixels will come.
 If the QR fades into the design, If the background material color is the same as the QR Code so the QR Code. A scanner can't determine what's the design and what's the QR Code. So, design QR Canons to match the background colors, but not in a manner that the QR Code is lost in the design.

Color discrepancy problems can also do from background accoutrements . In some QR Canons that are placed on a any board front and uses a transparent color discrepancy. Again the QR Code will loose in the color of the material and a scanner won't read it, nor will passersby be suitable to notice it. All QR Canons
must be published with the quiet zone easily separating the QR Code from its design, as well as uses colors that stand out from the background material.

When the QR Code was designed, if it's too small or not of high enough quality. So, when the QR Code is published, the image also appears vague and would not be scrutinized. It also detracts from the design of the total print material and deters the scanners. For small scale printing, QR Canons work
 in JPG and PNG formats. But looking for high- quality that will satisfy a graphic developer, we will have to conclude for EPS or SVG vector lines that are scalable to avoid losing print quality.

Either our QR Code is so small that no one can see it, or the QR Code is so big that it takes over the other needed contents. Either way, we won't get numerous QR Code scans with indecorous sizing in our design. However, QR Canons has to be at minimal 2 x 2 cm (about 0, If our print material is small or
medium- sized(similar as business cards or pamphlets 8 x0.8 in). still, also of course we need to gauge the QR Code with the size of the design, if our print material is larger.

There's a 404 error law that pops up after a stoner scans the QR Code. This is because the link is either missing or incorrect, inhibiting precious guests. So, we've to make sure that our
link is over to date for any marketing juggernauts. Test it ourselves before promoting it to guests.

2.2 GOALS and OBJECTIVES

1. The QR Code object has to have functions which can be used to produce the QR Code, add data.

2. The content of the QR law can be passed as an argument to this function.

3. Make still, the interpretation can be set automatically by a, If you aren't sure about which interpretation of QR law to use. setting interpretation parameter to None and setting fit parameter of make to True error position QR canons can use one of four possible error correction values.

4. The garbling used to represent the data in a QR law. There are four possible encodings double, numeric, alphanumeric, kanji.

5. Module data module A forecourt fleck on a QR law. Generally, only the " black " blotches count. The " white " places are considered part of the background. quiet zone An empty area around the QR law.

6. The area will be in the background module in color. According to the standard this area should be four modules wide.

7. QR law Quick Response law will be a two dimensional barcode developed by Denso Wave.

8. The interpretation of a QR Code will determine it maximum possible data capacity.

2.3 HARDWARE CONSTRAINTS

Processor : Pentium core-2-duo or higher.

Operating system : Microsoft Windows 7/8/10.

Memory: 512 MB RAM or higher.

Disk Space: 120 MB including 115MB available space on the hard disk that contains the OS.

2.4 SOFTWARE CONSTRAINTS

Software used : MICROSOFT VISUAL STUDIO CODE

Browser Program : Google Chrome 9.Programming

Language used : Python

Chapter 3

DESIGN PROCESS

3.1 EVALUATION AND SELECTION OF SPECIFICATIONS/FEATURES

If you are curious still barcode and QR law compendiums work. spark your phone's camera and show the featured image of this composition. you will see a link show up, it's terribly easy to use. moment, we're going to produce our own anthology, while not losing any time. Let's begin with selection if features/specifications!

1. We'll start by putting in the libraries that we will want for this design so we will start programming. For this design, I like to recommend employing a regular law editor rather than a Jupyter tablet.

2. The QRCode object is meant to be sensible concerning how it constructs QR canons. It'll mechanically work out what mode and interpretation to use to construct a QR law, supported the information and also the volume of error correction.

3. The error correction position defaults to the veritably stylish attainable position of error correction. Below are some samples of making QR Canons exploitation the machine-controlled system.>>> computer address = pyqrcode.create(' http//uca.edu')>>> url = pyqrcode.create(' http//uca.edu', error = 'L') There are several effects wherever you would conceivably would like to enjoy fresh fine granulated operation over still the QR Code is generated.

4. Error position QR canons will use one of four possible error correction values. They're appertained to by the letters L, M, Q, and H. The L error correction position corresponds to 7 of the law can be corrected. The M error correction position corresponds to 15 of the law can be corrected. The Q error correction position corresponds to 25 of the law can be corrected. The H error correction position corresponds to 30 of the law can be corrected.

5. The garbling used to represent the data in a QR law. There are four possible encodings double, numeric, alphanumeric, kanji. Module data module A forecourt fleck on a QR law.

6. According to the standard this area will be four modules wide.QR lawQuick Response law A two-dimensional barcode developed by Denso Wave. Interpretation A interpretation is one of 40 different possible sizes a QR law comes in. The interpretation of a QR Code determines it maximum possible data capacity.

7. We will specify all the parcels of our QR law through the facultative parameters of thepyqrcode.create() function. There are 3 main parcels to a QR law.

8. By dereliction this parameter is ready to ' H ' which is that the loftiest possible error correction, still it's the lowest on the request data capability for a given interpretation. The interpretation parameter specifies the confines and data capability of the law. performances are any number between one and forty. wherever interpretation 1 is that the lowest QR law, and interpretation 40 is the largest.

9. By dereliction, the item uses the information's encryption and error correction position to calculate the lowest attainable interpretation. you will need to specify this parameter for thickness once generating numerous QR canons with varied quantities of data.

10. All of the generated canons would have an original size. Eventually, the mode parameter sets still the contents are going to be decoded. 3 of the four possible encodings are available. By dereliction, the object uses the most effective encryption for the contents. you will be suitable to stamp this geste by setting this parameter. Seepyqrcode.tables.modes for a table of attainable values for this parameter. a way longer discussion on modes are frequently set up within the coming section encryption Data.

11. The law will construct a QR law with 25 error correction, size 27, and forces the garbling to be double(rather than numeric).

3.2 DESIGN CONSTRAINTS

The constraints include the necessity of the VS code and a python interpreter. Only one user can access the software at one time. Also, the QR should be saved as .jpg format and the QR should be given a proper name and content. The website should be having the data of the user and the QR will be generated.

Originally, we're turning on the camera of the computer using OpenCV. However, you must change the value 0 to 1 depending on the device, If you have an external camera.

Secondly, we run a while circle to keep running the decoding function until the "Esc " key is pressed. else, the circle won't stop and beget some issues.

Thirdly, we're releasing the camera that we turned on in the first step. And also we're closing the operation window. OpenCV is doing all the work, we just need to call the styles. Incipiently, we're calling the main function to spark the program.

We are planning to test with multiple barcodes or QR codes. The format information records two effects the error correction position and the mask pattern used for the symbol. Masking is used to break up patterns in the data area that might confuse a scanner, similar to large blank areas or misleading features that look like the locator marks.

The mask patterns are defined on a grid that's repeated as necessary to cover the whole symbol. Modules corresponding to the dark areas of the mask are reversed.
The format information is defended from crimes with a BCH law, and two complete clones are included in each QR symbol.
In larger symbols, this is complicated by the presence of the alignment patterns and the use of multiple interleaved error- correction blocks.
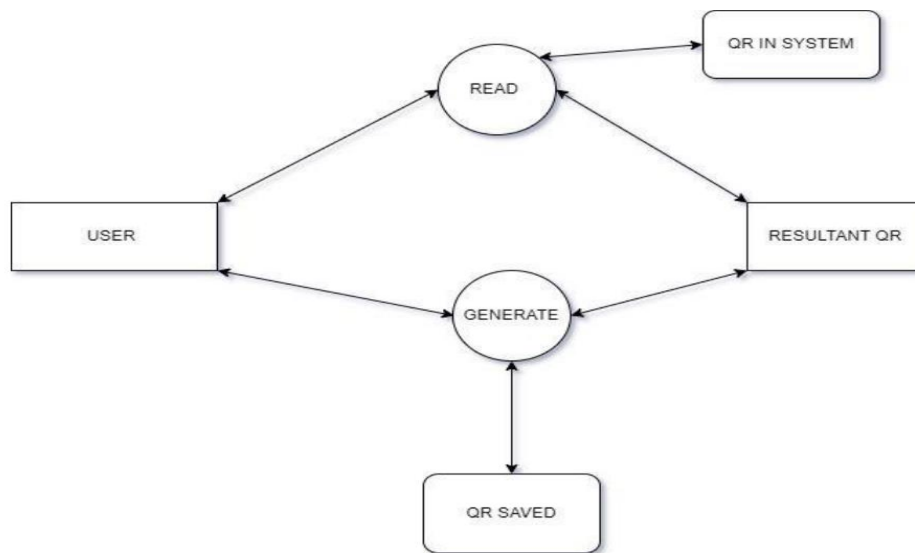
3.3 DESIGN SELECTION

Figure 3.1: DFD Diagram

The above DFD we have chosen for Design Selection. The only environment within which common QR canons can carry practicable data is that the URL data sort.

These computer address may host JavaScript law, which might be used to exploit vulnerabilities in operations on the host system, original to the anthology, the net cybersurfer or the image bystander, since a anthology can generally shoot the information to the appliance related to the data type employed by the QR law.
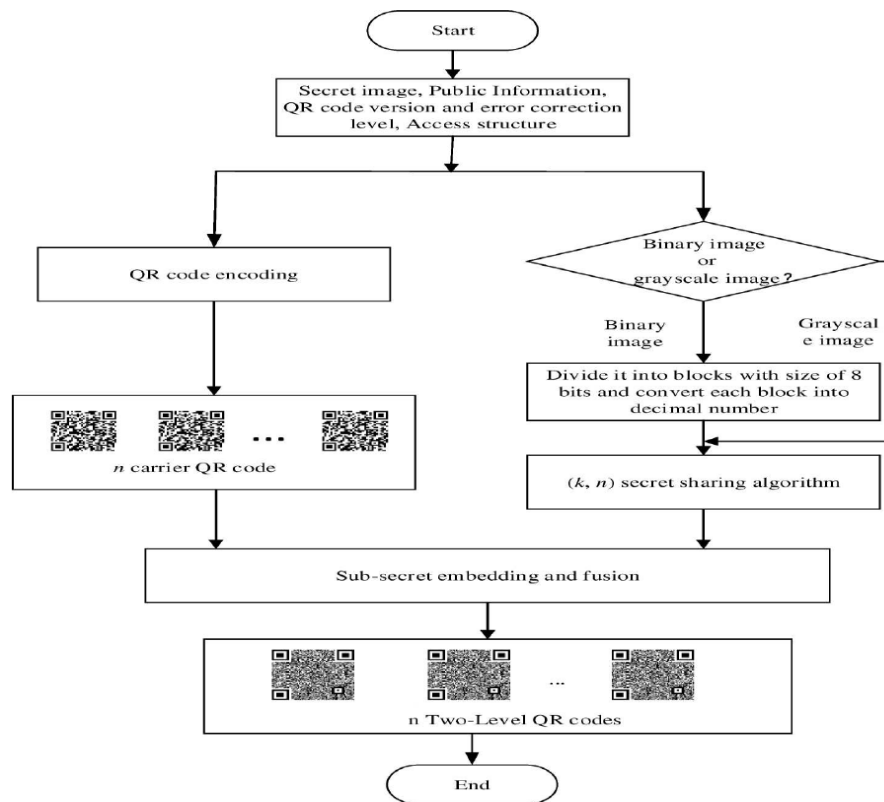
3.4 IMPLEMENTATION PLAN/METHODOLOGY

Figure 3.2: Block diagram of proposed system

Start with any information in the form of content or relevant data or link.
This information will be further with the help of qr code library and generate function will be generated and stored in the image format.
The algorithms for the generation are stored In the library. The qr code gets generated. Now, with CV2 library , the qr file inside the system is verified and content is displayed.

Chapter 4

RESULT ANALYSIS AND VALIDATION

4.1 Implementation of Solution

The design methodology will be grounded on the popular Waterfall model.

Functional Conditions:

The system must take the input from the user. The affair should be a generated QR law or scrutinized data.

Non-Functional Conditions:

The system shall give information about colorful Wikipedia affiliated questions etc. The design shall commence from the month of August and shall be completed by October 2nd week.

The design will make use of colorful libraries QR law and app developing affiliated libraries.

QR law reading and generating should have a delicacy of 7 out of 10. The language chosen to apply the design will be in python.

Implementation Of QR Code Reader and Generator

To induce a QR law you have to input data and also save the data with the name you want. To read the QR law you have to import an image of QR law and also the data present in QR law will be displayed on screen.

This project generates the QR code according to the name given by the user and provides the text to the QR code that too is entered by the user.

This project detects the QR law present in the computer with same name anywhere in the computer. Still, the creator checks it, reads it and then displays the content of the QR on the affair window, if the QR is present in the computer. Farther, we will just produce a main function that will use the tentative statements and the stoner to either induce or read the QR law. Still, he/she will have to give the name and content of the QR, If the stoner wants Yō induce the QR.

Differently, he or she will have to enter the name of the QR to check its validness and if valid, display its content on the terminal.

4.1.1 Analysis

The end of the practicably study is to probe the strengths, sins, openings and pitfalls of mistreatment QR canons

concertedly attainable resolution for driving customer operation through particular data.

It checked out the implicit prices and advantages of using QR canons for this purpose and targeted specifically on

the energy sector, marketable feasibility grounded upon the image statement from discussion, we do not feel to be major problems with accommodating QR canons, either from incorporating into the planning or branding, from situating on bills or indispensable supply challenges. While some word on the bill is regulated, of gem suggested the QR law cluster to figure to its streamlined Gregorian timetable month 2012 RMR proffers.
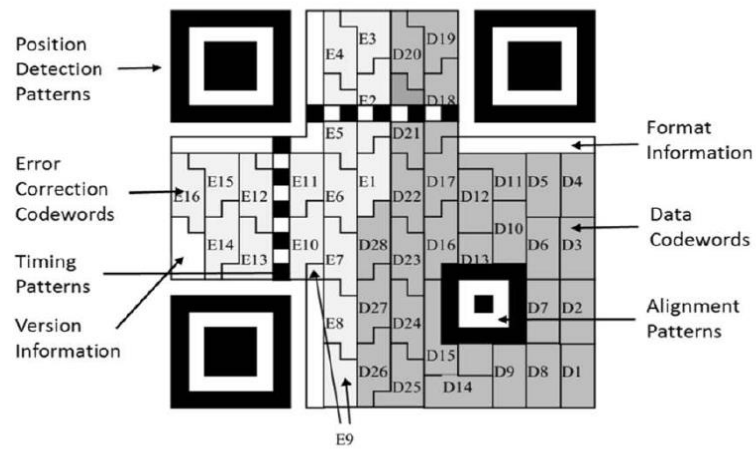

Figure 4.1: QR Sample

Figure 4.2: QR Architecture

4.1.2 Results

Market Cost/Benefit: It's anticipated that change spots particularly can invest in smartphone operations that overlook QR canons because the specialized value is comparatively low and also the benefit is high. Guests generally do not enter their energy use formerly victimization switching spots and resort to finishing comprising input boxes respect Low, Medium or High.

This consecutively results in recommendations being general and presumably inaccurate. With QR canons breakdown the query for shoppers for each tariff and operation, it's anticipated that artificial competition will drive vital marketable pay on dealing conditioning by switching spots.

None of the energy enterprises concerned within the unit have indicated that the value of development to incorporate QR canons on bills and statements would be vital enough to contemplate a necessity to directly increase prices to shoppers. easily, still, all costs are eventually borne by consumers, thus there ought to be inflexibility to permit development cost to be balanced with standardization for any QR Code result.

Features of QR Generator:

• Create Dynamic QR code
• Read a QR code
• Unlimited URL Changes
• Reusable QR codes
• Convert any text to QR code

Chapter 5

SYSTEM IMPLEMENTATION

PROGRAM CODE:

```python
import qrcode

import tkinter as tk

from tkinter import filedialog

from PIL import Image, ImageTk


class QRCodeGenerator:

    def __init__(self, master):

        self.master = master

        master.title("QR Code Generator")

        master.geometry("500x500")


        # Set the font style to Montserrat

        font_style = "Montserrat"


        # Create a label for the input text

        self.label = tk.Label(master, text="Enter text or link:", font=(font_style, 14))

        self.label.pack()


        # Create an entry widget for the input text

        self.text_entry = tk.Entry(master, font=(font_style, 12))

        self.text_entry.pack()
```

```python
        # Create a button to generate the QR code
        self.generate_button = tk.Button(master, text="Generate QR Code", command=self.generate_qr_code,
    font=(font_style, 12))
        self.generate_button.pack()


        # Set the background color to "#2C3E50"
        master.configure(background="#2C3E50")


        # Create a label to display the generated QR code
        self.qr_code_label = tk.Label(master, bg="#2C3E50")
        self.qr_code_label.pack()


        # Create a button to print the generated QR code
        self.print_button    =    tk.Button(master,    text="Print    QR    Code",    command=self.print_qr_code,
    font=(font_style, 12))
        self.print_button.pack()


    def generate_qr_code(self):
        # Get the text from the input entry
        text = self.text_entry.get()


        # Generate the QR code image
        qr = qrcode.QRCode(version=1, box_size=10, border=5)
        qr.add_data(text)
        qr.make(fit=True)
```

```python
        img = qr.make_image(fill_color="black", back_color="white")


        # Convert the image to a format that can be displayed in tkinter

        img = ImageTk.PhotoImage(img)


        # Update the label to display the generated QR code

        self.qr_code_label.configure(image=img)

        self.qr_code_label.image = img


    def print_qr_code(self):
        # Get the generated QR code image

        img = self.qr_code_label.image


        # Convert the PhotoImage to an Image object

        pil_img = ImageTk.getimage(img)


        # Prompt the user to select a location to save the image

        file_path = filedialog.asksaveasfilename(defaultextension=".png")


        # Save the image to the selected location

        pil_img.save(file_path)


root = tk.Tk()

qrcode_generator = QRCodeGenerator(root)

root.mainloop()
```
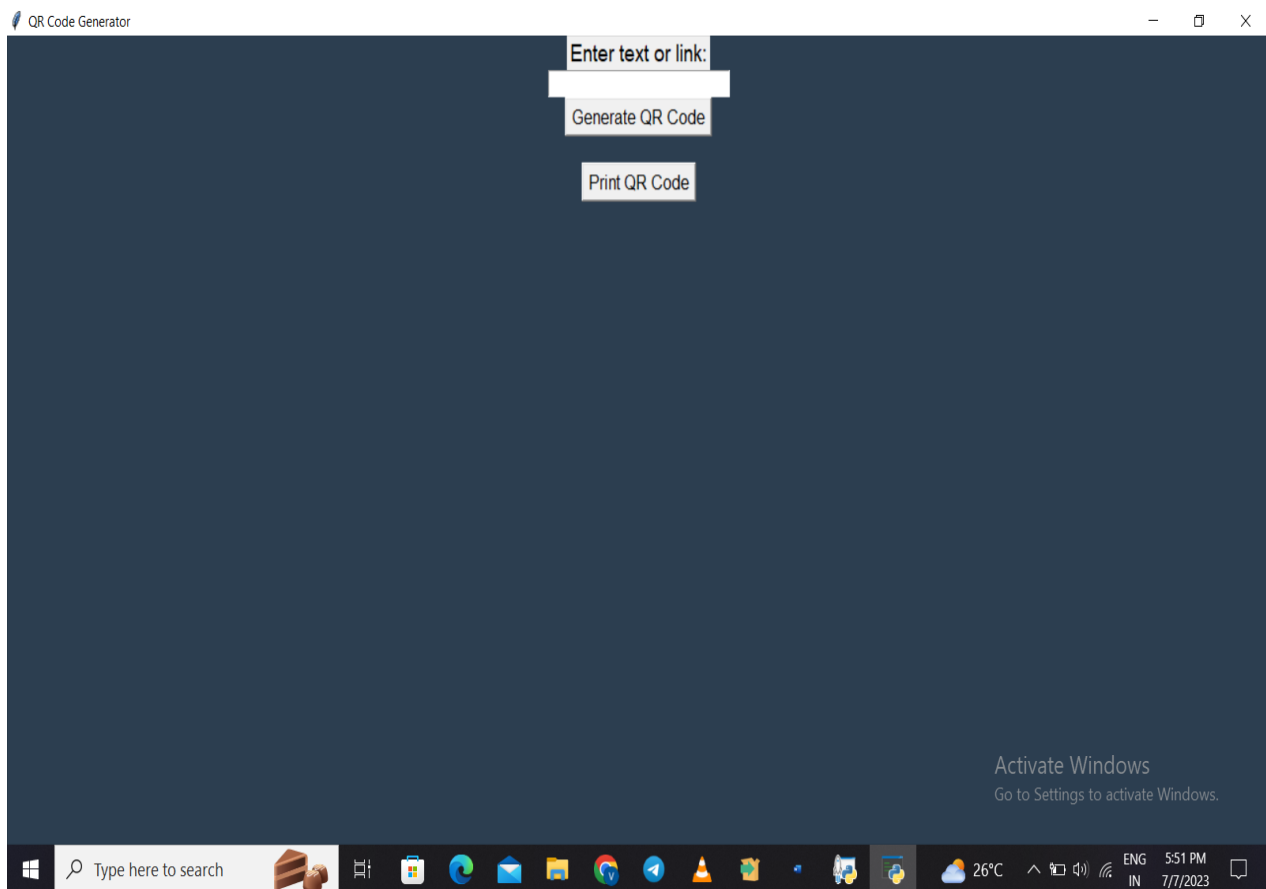
Chapter 6

SCREENSHOTS
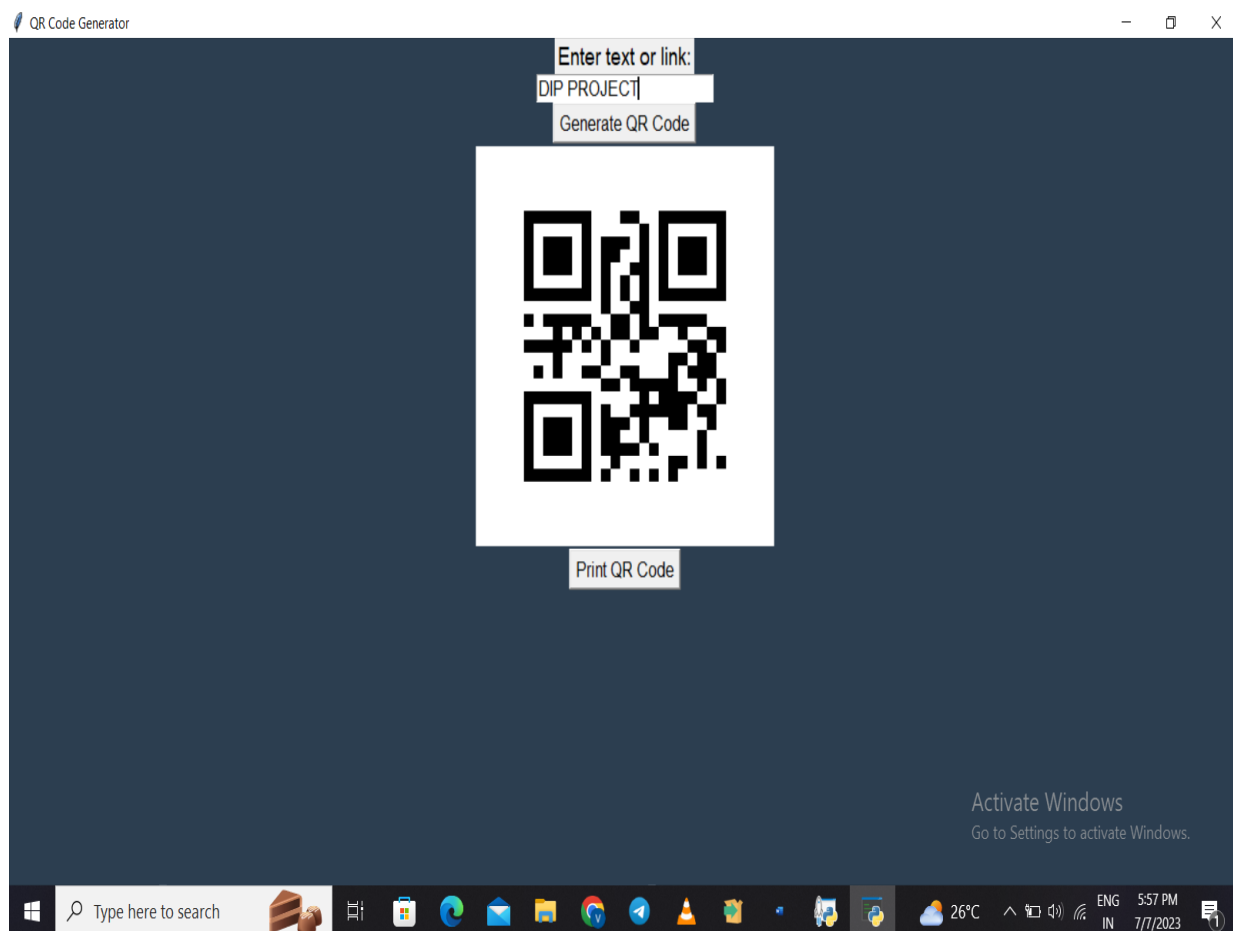

Figure 6.1: QR code generator

Figure 6.2: Generated QR code

Chapter 7

CONCLUSION AND FUTURE SCOPE

7.1 CONCLUSION:

In the decades since the prefaced QR canons, it's stoked fleetly. From 1994, several canons are developed still QR law still remains functional. It's still more advanced than barcodes that are used under the QR canons and with its professionals it tends to prompt better. still QR canons do not feel to be an provident thanks to shoot data because it's decrypted with any good phones with QR law app anthology and causing data.

Shoppers have an interest in interacting with vicious advertising that bears a QR law- so, the pledge of farther edges within the kind of deals, tickets, vids, sweepstakes, social media relations, and so forth OR canons will grease a bill break through the muddle by adding the prospect it will be flashed back, nice news for advertisers who have formerly integrated a QR law strategy into a standard campaign or are wanting to fit one in an exceedingly unborn crusade.

"Quick Response"(QR law) could be a matrix law. As compared to 1 dimensional barcode it should store a large volume of knowledge and mistreatment any hand- held bias like Smartphones it must be

deciphered at high speed. These 2 points are taken into study whereas planning two-dimensional matrix canons.

When a bar- law contains veritably important information or sequestration information, the prospect of security becomes a awfully important aspect. as a result of QR canons simply feature asq. bar- law with a particular pattern, people do not feel to be apprehensive if the law will take them to respectable

information or misguide them to an internet point loaded with malware.

Currently, a QR law is applied in numerous operation aqueducts related to promoting, security, speakers and so on and gaining fashionability at a veritably high pace. step by step a lot of individualities have gotten habituated to this technology and use it consequently. The recognition of QR law grows swiftly with the expansion of smartphone druggies and so the QR law is hastily inbound at high situations of acceptance.

7.2 FUTURE WORK:

QR canons can store contents similar as textbook, URL links, automatic SMS dispatches, or any other information that can be well- established in a two- dimensional barcode. This programmed data can be decrypted by surveying the barcode with a mobile device that's equipped with a camera and QR anthology software.

Although QR canons are veritably flexible and have been around for over eighteen times, their use in numerous fields. like medical, business, education, security are still in its immaturity.

This has shown that QR law can notice sensible operations in mobile network recharge operation services this fashion because it relies on MTN network can solely induce N100, N200, N400, QR recharge law. still, the software package operation will be bettered upon to come up with N750, N1500, etc recharge tickets also as different tickets for other mobile networks, like transnational com, 9mobile, etc.

This system is applicable for localization of single or multiple QR Canons in low- resolution images as well as for real time processing. The proposed strategies use typical position discovery patterns of QR Canons

supposed finder patterns to spot 3 corners of QR Canons in an image.

 The optimum position of the fourth corner of the QR Code is decided by assaying the direction of vertical and perpendicular edges and by adding the quality divagation of vertical and perpendicular

protrusions of those edges.

Prerequisites of our fashion are the actuality of complete finder patterns and quiet zones around a QR Code. The novelty of our system lies within the system the bounding box of a QR Code is determined, particularly for perspective- distorted QR Canons and the way variable- sized modules are handled. This system was valid on the testing set conforming of artificial and jointly real world samples and it had been compared with competitive

results.

The experimental results show that our fashion contains a nice discovery rate. in discrepancy to different papers, we've a tendency to contemplate a QR Code to be with success honored handed that it's jointly

decrypted, not simply localized. Precise localization could be a necessary still not sufficient condition for thriving decoding. This platform could be used by different security heart associations.

Chapter 8

BIBLIOGRAPHY

Gupta, Kishor Datta; Ahsan, Md Manjurul; Andrei, Stefan (January 2018). "Extending the Storage Capacity And Noise Reduction of a Faster QR-Code". Brain Broad Research in Artificial Intelligence and Neuroscience. 9 (1): 59–71.

Hajra Shannon (18 October 2010). "Form Meets Function: Functionality and Form of QR Codes". Retrieved 29 July 2010. .

Hein, Buster (21 September 2017). "How to scan QR codes with iOS 11's Camera app". Cult of Mac. Archived from the original on 5 January 2019. Retrieved 28 May 2019.

Hung, Shih-Hsuan; Yao, Chih-Yuan; Fang, Yu-Jen; Tan, Ping; Lee, RuenRone; Sheffer, Alla; Chu, Hung-Kuo (1 September 2020). "Micrography QR Codes".

IEEE Transactions on Visualization and Computer Graphics. 26(9): 2834–2847doi:10.1109/TVCG.2019.2896895. ISSN 1077-2626. PMID 30716038. S2CID 73433883.