QR CODE GENERATOR USING PYTHON

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ABSTRACT

QR codes were developed in the 1990s as a way to provide more information than a standard bar-code.QR code was invented by a Japanese engineer Masahiro Hara from automobile manufacturer Denso Wave in the year 1994 to track the movement of car parts. QR codes consist of black squares arranged in a grid (matrix) on a white background and are read by specialized software that is able to extract data from the patterns that are present in the matrix. These codes are capable of containing more information than traditional barcodes, and primarily handle four modes of data: alphanumeric, numeric, binary, and Kanji. QR code means Quick Response Code. Now a days it is used widely in many organizations. QR codes are frequently used to track information about products in a supply chain. QR Code has increased in popularity in the later 2010s with improvement in optical capabilities of mobile phones and their wide adoption.Nowadays, QR codes are being used for wide variety of applications like,make online payments, check hotel menu, share wifi password, obtain price and other details of products etc. QR Codes have become so popular that now every new smartphone comes within built QR code reader.

Keyword: - *QR code, Quick Response Code, Storage Capacity, Online QR Code Generator. etc....*

1. INTRODUCTION-

QR Code is two-dimensional barcode which is categorized in matrix barcode that can store data information. QR stands for "Quick Response" as the creator intended the code to allow its contents to be decoded at high speed. It is introduced in Japan by Denso Corporation in 1994 [1]. This kind of barcode was initially used for tracking inventory in vehicle parts manufacturing and is now used in a variety of industries. Nowadays, mobile phones with built-in camera are wildly used to recognize the QR code [1-4]. There have been many URL shortening services that automatically generate QR code links to websites such as Goo.gl [5] and Bit.ly [6]. Goo.gl is the first introduced URL shortening service that provides automatically generates QR codes. only 12 days after introducing Goo.gl, Bit.ly launched the same service. The URL shortening service shortens link and turn it into a QR code that, when scanned with a mobile QR code reader, automatically direct users to the shortened link. It really shows that QR codes are going to become more and more popular.

"Module configuration" refers to the number of modules contained in a symbol, commencing with Version1 (21×21 modules) up to Version 40 (177×177 modules). As version increases number of modules in a QR code also increases which can store more data. The QR Code is the trademark for a type of matrix barcode (two- dimensional barcode) first designed by the automotive industry in Japan. Also, a barcode is a machine-readable optical label that contains information about the item to which it is attached. A QR code uses four standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to efficiently store data; extensions may also be used. It has a larger set of machine readable codes as compared to the one-dimensional barcode and it can hold more data because it uses both the horizontal and vertical axis. It is widely used in different fields such as manufacturing and mobile marketing. QR codes have a more advanced error correction mechanism and are more reliable as it has a faster speed than other codes (Adeel et al., 2014). Below is a sample of a QR Code. They were first created in 1994, its purpose was to track vehicles during manufacturing; it was also designed to allow high-speed component scanning. In 2002, when Japanese handset makers and others wanted to turn everyone's phone camera into a barcode scanner for marketing purposes, QR codes were very handy. With two dimensions of operation, QR codes are able to store several hundred times the amount of information carried by ordinary bar codes. They can contain anything that can fit into a maximum of about 4k (roughly one page of text). These codes are versatile. Application of QR Codes

include their use on newspapers, magazines, journals, websites, advertisement, and advertisement board, where they are depleted to store websites' addresses, content information and miscellaneous data. Also, the QR Code is used in advertisements to guide people to visit their websites in the business world. Additionally, the QR Code becomes an official tool that is utilized in governments and companies. In 2011, the Royal Dutch Mint announced that QR Code which will be embedded into the official coin would direct a user to a website about the Royal Mint's centennial.

2.QR CODE

A quick response (QR) code is a type of barcode that can be read easily by a digital device and which stores information as a series of pixels in a square-shaped grid. QR codes are frequently used to track information about products in a supply chain and often used in marketing and advertising campaigns. QR codes are considered an advancement from older, uni-dimensional barcodes, and were approved as an international standard in 2000 by the International Organization for Standardization (ISO). QR codes consist of black squares arranged in a grid (matrix) on a white background and are read by specialized software that is able to extract data from the patterns that are present in the matrix. These codes are capable of containing more information than traditional barcodes, and primarily handle four modes of data: alphanumeric, numeric, binary, and Kanji.Despite the increased data capacity, QR codes have not been as popular with consumers as expected. Rather than being created by consumers to share information, they are most commonly associated with advertisers and marketing campaigns.

Fig.1 QR Scanner

2.2 Business QR Code

A Business QR Code is a QR Code solution that creates a succinct business page for your company. It functions as a landing page with a customizable CTA (call to action) button that directs users to a particular area of your own website, or whichever content you'd like users to view. The business page is automatically optimized for mobile and can be designed to match your brand's individual style.
Business cards are not only extremely limited in space, but without a QR Code, your contact details and links still have to be separately and manually typed. A Business QR Code neatly summarizes your entire business concept into one page with all the right links and details, which make it much simpler for someone to find those links and contact you. They're great for networking events as well as work on any marketing materials - both print and digital.

3. PROPOSED SYSTEM ARCHITECTURE

To overcome the problems faced in the existing system, we proposed a new system ie advance QR code which can create a QR code for larger data. This system can create QR of different versions. The amount of data that can be stored in the QR code symbol depends on the datatype (mode, or input character set), version (1, ..., 40, indicating the overall dimensions of the symbol, i.e. $4 \times$ version number $+ 17$ dots on each side), and error correction level. The maximum storage capacities occur for version 40 and error correction level L (low), denoted by 40-L. Python Flask Framework: Flask is a micro web framework written in Python. It is classified as a micro framework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself. It provides

the user with libraries, modules and tools to help build Web Applications such as a blog or wiki. The unit testing of the developed mobile network recharge voucher application was carried out using Python flask frame work. Python flask is a unit testing framework that provides a Java Virtual Machine (JVM) compliant version of the Android Mobile Scanner App. This permits developers to write codes to test each units of their android application and run them on android studio MVC IDE while still using the Android Application Program Interface (API). Python flask is an interpreter, high-level, general-purpose dynamic programming language used for everything, from server automation to data science. It is an open-source software. Python is a great language for beginners, because it is easy to read and understand. You can also do so many things with Python flask that makes it easier to stick with the language for quite a while before needing something else. Python finds itself at home when creating Web Apps like Instagram and helping researchers make sense of their data (Susono, et al, 2006). The syntax in python helps the programmers to do coding in fewer steps as compared to java or C++. Debugging can be done easily with this language too. Python also processes XML and other markup languages as it can run on all modern operating systems through same byte code. The programming language used in this project is Python Flask Programming. We also made use of HTML, CSS, Bootstrap, and Java Script, and we made use of the Notepad ++ 6.7 as the code editing environment (Sowern, 2011). Additionally, C-Sharp Programming Language was used. The C# is a hybrid of C and C++, it is a Microsoft programming language developed to compete with Sun's Java language. C# is an objectoriented programming language used with XML-based Web services on the .NET platform and designed forimproving productivity in the development of Web applications

Maximum character storage capacity (40-L)

character refers to individual values of the input mode/datatype

Input mode	max. characters	bits/char	possible characters, default encoding
Numeric only	7,089	3⅓	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Alphanumeric	4,296	5½	0–9, A–Z (upper-case only), space, $, %, *, +, -, ., /, :
Binary/byte	2,953	8	ISO 8859-1
Kanji/kana	1,817	13	Shift JIS X 0208

Fig.2 Proposed System Architecture

Fig.3 Different Qr Code Types

Two-dimensional (2D) matrix codes are a way how to efficiently store data that are machine readable. Thanks to the great spread of smartphones, 2D matrix codes have found application in many areas of life and industry. QR (quick response) Code was invented in 1994 by Denso Wave for the automotive industry in Japan, but nowadays has much wider usage. They are widely used in segments such as manufacturing, logistics, sales, media, advertising, tourism, e-commerce, identification, and authentication [1,2]. The QR Code often contains additional information about the product, the object or the place where it is located. However, they can also be a URL to a web page, Global Positioning System (GPS) coordinates, contact details, delivery address, payment instructions, etc. QR codes belong to a group of 2D matrix codes (similarly the data matrix codes). Traditional QR code (QR code Model 1 and Model 2) has a square shape and on its three corners are typical square-shaped patterns—finder patterns (FP), which are used to locate the code and to determine its dimensions and rotation
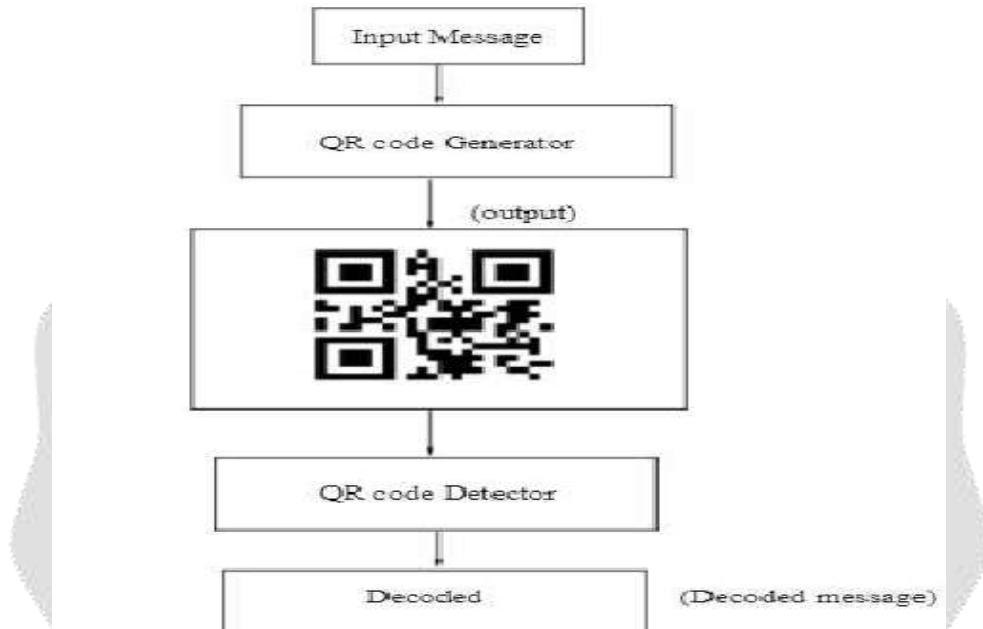

Fig.4 Block Diagram Of Proposed System

4. STEPS TO BUILD THE QR CODE GENERATOR IN PYTHON

To Build QR Code Generatror Project Using Python We Needed To Follow The Below Steps
1. Importing the Modules
2. Creating the main window
3. Taking the input of the text/URL, location to store the QR code, name of the QR code and the size of the QR code
4. Writing the function to generate and save the QR Code

1. Importing the modules
The first step is to import the qrcode and the tkinter module. We use the messagebox in the tkinter module to show the pop up messages.
from tkinter import*
import qrcode
from PIL import Image,ImageTK
from resizeimage import resizeimag
2.Taking the inputs
Now, we take the inputs from the user to create the QR Code. We take the following inputs:
1. Text/URL as Entry() named as 'text'
2. Location to save the QR Code as Entry() named as 'loc'

3. Name of the QR Code image when saved in the device as Entry() named as 'name'
4. Size of the QR Code to be generated as Entry() named 'size'. In this the user has to give the size in the range 1-40. 1
being the smallest size of 21×21.
Then we create a button when clicked generates the QR Code and saves it by executing the generateCode() function.
4. Creating the function to generate QR code and save it
Finally, we create the function to generate the code that runs on clicking the button. In this,
1. First we create the QRCode object with the version/size that user gave as input in the size() entry
2. Then we add the text that we need to encode by getting from the entry 'text'
3. Then we get the QR code and save it in the directory that user gave as input
4. After this, we show the pop up message to confirm the user that the image is saved
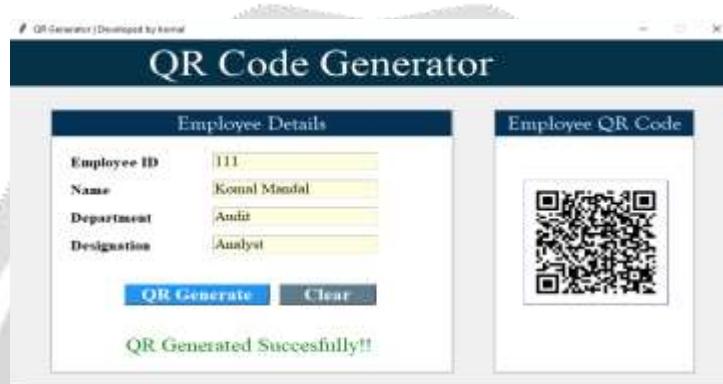
Fig.5 Login Page

5. 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 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, 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.

6.FUTURE SCOPE

In this paper, 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 by day and at the same time it is becoming increasingly secure as the technology is enhancing. Once, the awareness about these codes increases, it will get a wide spectrum to evaluate its significance. In near future, this technology will 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. as a second fiddle while doing money related transactions. These codes are slowly becoming first preference for many users in the recent times. The main limitation of QR codes is that they are only being used to redirect to a webpage or website but they are not collecting any information on their own. If in this hugely data driven world, if these codes start to collect information and start a two-way transaction then it will surely stabilize in this technology market for future years. Another limitation regarding the application of QR codes is that one must have a QR code reader or scanner installed in their mobile or tablet to be able to scan and read the data held by the QR code. Instead of this, we can create and integrate the QR code scanners in our smartphone's camera itself so that we don't need any other third party application to scan the QR codes. QR codes have been scrutinized by many of the technology and security pundits but still it has been loved and accepted by the normal people at a high context. They have been literally used everywhere as far as promotional events are concerned like mobile payments, coupons, air ticket coupons, business cards, new business profile promotions etc. There are new technologies launching in the last couple of years who are better or more secure than QR codes, but still QR codes will be there for many more years to come because of the ease of their use and many people in the developing countries already adapting them in the recent past. So it is a rare possibility that they will again turn to a new technology after taking so much years to get used to the QR codes.

7. CONCLUSIONS

In this paper, 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 by day and at the same time it is becoming increasingly secure as the technology is enhancing. Once, the awareness about these codes increases, it will get a wide spectrum to evaluate its significance. In near future, this technology will 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.

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