QR CODE GENERATOR

INTRODUCTION

QR stands for "Quick Response.

While they may look simple, QR codes are capable of storing lots of data. But no matter how much they contain, when scanned, the QR code should allow the user to access information instantly – hence why it's called a Quick Response code.

A 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 – because many smartphones have built-in QR readers – they are often used in marketing and advertising campaigns. More recently, they have played a key role in helping to trace coronavirus exposure and slow the spread of the virus.

HISTORY

The first QR code system was invented in 1994 by the Japanese company Denso Wave, a Toyota subsidiary. They needed a more accurate way to track vehicles and parts during the manufacturing process. To achieve this, they developed a type of barcode that could encode kanji, kana, and alphanumeric characters.

Standard barcodes can only be read in one direction – top to bottom. That means they can only store a small amount of information, usually in an alphanumeric format. But a QR code is read in two directions – top to bottom and right to left. This allows it to house significantly more data. The data stored in a QR code can include website URLs, phone numbers, or up to 4,000 characters of text.

QR codes can also be used to:

- Link directly to download an app on the Apple App Store or Google Play.
- Authenticate online accounts and verify login details.
- Access Wi-Fi by storing encryption details such as SSID, password, and encryption type.
- Send and receive payment information.

- a company in the UK called QR Memories even creates QR codes for use on gravestones, allowing people to scan the code to read more about that deceased person's life (if they have an obituary or news story relating to them online).

The development team behind the QR code wanted to make the code easy to scan so that operatives did not waste time getting it at the right angle. They also wanted it to have a distinctive design to make it easy to identify. This led them to choose the iconic square shape that is still used today.

Denso Wave made their QR code publicly available and declared they would not exercise their patent rights. This meant anyone could make and use QR codes.

Initial uptake of the idea was slow; however, in 2002, the first mobile phones containing built-in QR readers were marketed in Japan. The use of smartphones led to an increase in the number of companies using QR codes.

In 2020, Denso Wave continued to improve on their original design. Their new QR codes include traceability, brand protection, and anti-forgery measures. There are many new uses for the QR code, from transferring payments to determining objects' positions within augmented reality.

Why is the demand for QR Codes constantly rising?

We've seen that the demand for QR Codes has soared in recent years. Let's now see some of the reasons behind this increase:

1. Ability to store a large amount of data and multimedia:-
QR Codes can store 7,089 characters which is way more than a traditional barcode. Yes, it's that powerful!

In fact, among the two, a QR Code can store much more information than a barcode of the exact same size. Quite powerful, right?

In addition, QR Codes are not limited to storing text. They can redirect your end-users to see multimedia content such as images, videos, and audio too.

2. Flexibility to add customization:-

Barcodes are typically black-and-white and are pretty dull to look at. On the other hand, QR Codes can be customized by adding colors and logos to them.

Hence, marketers often use branded QR Codes for their campaigns. This helps them build brand recognition while grabbing audience attention to get more scans.

3. Ease of accessibility:-

As mentioned above, the increase in internet penetration globally has fueled the adoption of QR Codes.

In addition to that, most smartphones today come with an in-built QR Code scanning feature. All that you need to do is—open your phone's camera and hold it in front of the QR Code.

Within 2 seconds, you'll get a notification, and the QR Code will be scanned. It's as easy as clicking a picture.

In case your smartphone doesn't have this feature, you can install a free third-party QR Code scanning application.

4. Ability to track scans:-

Did you know that QR Codes can be tracked for their scanning activity? For example, the number of scans based on:

- Date and time
- Device
- Operating system
- Geographical location

  Some QR Code generators even allow you to monitor the exact GPS location of scans. All this data comes in handy while assessing your campaign performance and optimizing your future campaigns too.

5. Affordability:-

QR Codes don't need you to set-up and dedicated handheld scanners. All you need to scan a QR Code is your smartphone. No need to invest in any cost-intensive setup.

Can someone hack a QR code?

The QR codes themselves can't be hacked – the security risks associated with QR codes derive from the destination of QR codes rather than the codes themselves.

Hackers can create malicious QR codes which send users to fake websites that capture their personal data such as login credentials or even track their geolocation on their phone.

This is why QR users should only scan codes that come from a trusted sender or sources.

How do QR codes work?

The patterns within QR codes represent binary codes that can be interpreted to reveal the code's data.

A QR reader can identify a standard QR code based on the three large squares outside the QR code. Once it has identified these three shapes, it knows that everything contained inside the square is a QR code.

The QR reader then analyzes the QR code by breaking the whole thing down to a grid. It looks at the individual grid squares and assigns each one a value based on whether it is black or white. It then groups grid squares to create larger patterns.

What are the parts of a QR code?

A standard QR code is identifiable based on six components:

1. **Quiet Zone -** This is the empty white border around the outside of a QR code. Without this border, a QR reader will not be able to determine what is and is not contained within the QR code (due to interference from outside elements).
2. **Finder pattern -** QR codes usually contain three black squares in the bottom left, top left, and top right corners. These squares tell a QR reader that it is looking at a QR code and where the outside boundaries of the code lie.
3. **Alignment pattern** - This is another smaller square contained somewhere near the bottom right corner. It ensures that the QR code can be read, even if it is skewed or at an angle.
4. **Timing pattern -** This is an L-shaped line that runs between the three squares in the finder pattern. The timing pattern helps the reader identify individual squares within the whole code and makes it possible for a damaged QR code to be read.

5. **Version information -** This is a small field of information contained near the top–right finder pattern cell. This identifies which version of the QR code is being read (see “Types of QR code” below).
6. **Data cells -** The rest of the QR code communicates the actual information, i.e., the URL, phone number, or message it contains.

What are the different styles of QR code?

It is possible to create QR codes in many different shapes and styles, but five types are most commonly found. They all do the same job – they just look slightly different.

1. QR code - This is the original version of the QR code created by Denso Wave in the 1990s. It's easy to identify by its three finder patterns in the bottom–left, top–left, and top–right corners.

2. Aztec code - While it looks similar to a QR code, the Aztec code, developed by Welch Allyn, contains only one finder pattern, right in the middle.

3. Maxi code - This type of QR code is used by the United States postal service. It's similar to the Aztec code in that it places the finder pattern in the middle, but it uses a honeycomb pattern instead of squares.

4. PDF417 - Invented in 1991 by Ynjiun Wang of Symbol Technologies, the oddly named PDF417 predates the QR code by three years. It looks like a mix between a QR code and a barcode and is easily recognizable by its rectangular shape.

5. Semacode - Developed by a software company of the same name, the Semacode is a data matrix that looks a lot like an ordinary QR code but doesn’t have recognizable finder patterns.

QR code use examples

QR codes are used in numerous contexts:-

1. QR codes in sales and marketing

Many advertisers use QR codes in their campaigns because it provides a faster and more intuitive way to direct people to websites than by entering URLs manually.

They can also be used to link directly to product pages online. For instance, if you were searching for the exact dress a model was wearing in a poster, a QR code could directly take you to the web page where you could purchase it.

2. QR codes for coronavirus tracing

The coronavirus pandemic has supercharged the use of QR codes. For example, in the UK, visitors to hospitality venues such as bars and restaurants are invited to scan a QR code upon arrival using the NHS Covid-19 tracing app. This is to help trace and stop the spread of the virus. If someone tests positive for Covid-19 at that venue, other visitors to the location are alerted by an app, thanks to the data accumulated from QR code scans.

3. QR codes on product packaging

You may also find QR codes on the packaging for some of your favorite products. These QR codes can reveal information about the product, such as nutritional information or special offers you can use next time you make a purchase.

4. QR codes in industry

QR codes were initially invented to help track parts in vehicle manufacturing, and they are still used throughout the manufacturing industry. You'll also find QR codes used by other businesses that need to keep a close eye on products and supplies, such as the construction, engineering, and retail industries.

5. QR codes in postal services

Postal services around the world also use them. Because they can contain a large amount of information, they are often relied upon to track parcels. For example, global fashion brand ASOS have moved entirely to QR codes for tracking refunds.

6. QR codes in education

QR codes are also used in schools and colleges to help engage with students. They have appeared everywhere, from the classroom to the library, for tasks such as helping students find the books they are searching for.

Types of QR codes

QR codes have two types: Static QR code and Dynamic QR code.

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2. **Dynamic QR code**

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1. Static QR codes:-

Static QR codes are free to create in any QR code generator available online. But mostly, they only function for a limited time.

For example, some QR code generators will require you to have a 14-day trial period, and after that, your static QR code will not function.

Thus, redirecting you to an error 404 page. But we can't produce as many static QR codes as we like, and it will expire, and your QR codes will have limited scans!

The data behind a static QR code will only lead you to a permanent address, and it is not changeable.

This applies to all QR code generator software. Once the QR code is static, the information is hard-coded and cannot be changed.

2. Dynamic QR codes:-

Dynamic QR codes will require your active subscription in any QR code generators online. That's how it is.

But dynamic QR codes are an advanced type of QR code.

Meaning, you can update the data behind your QR code even when it has been printed or deployed!

Mostly, dynamic QR codes make active participation as a tool in business, marketing, and advertising, where the user has full control of his QR codes, where he can change or re-target his QR code to another landing page or information.

Furthermore, dynamic QR codes are not just editable, but they are also trackable.

Using a dynamic QR code generator online to where the dynamic QR codes are stored, scanning activity such as when your QR code gets the most scans, the location of your scanners, and the map view.

Scope

With ever-increasing digital fintech solutions, the demand for scan-to-pay contactless payment is also increasing. Every big and small merchant or bank is using and promoting the QR codes. The easy, simple, affordable, and most accessible payment mode that has ever come into the digital payment world is QR code payments.

This payment solution is more facilitated because of the wallets integrated with it. These wallets are linked with banks and are made available by financial institutes. So ultimately everyone, using QR codes is acting as an added advantage for banks and financial institutions.