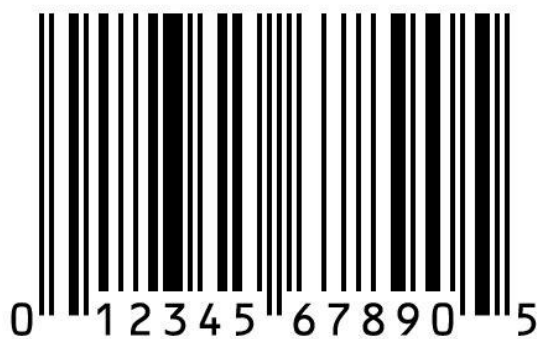# QR Codes

QR (Quick Response) codes are two dimensional barcodes that can store various types of data. They can store website addresses (URLs) which provides an easy way to open a website on a smartphone along with many other types of data.

One dimensional bar codes, like UPC (Universal Product Code) barcodes on packages look like a set of lines of varying thickness. They can store up to 128 characters and look something like this:

QR codes are two dimensional images made of up squares. This one goes to my website (http://davetaenzer.com/docs/)

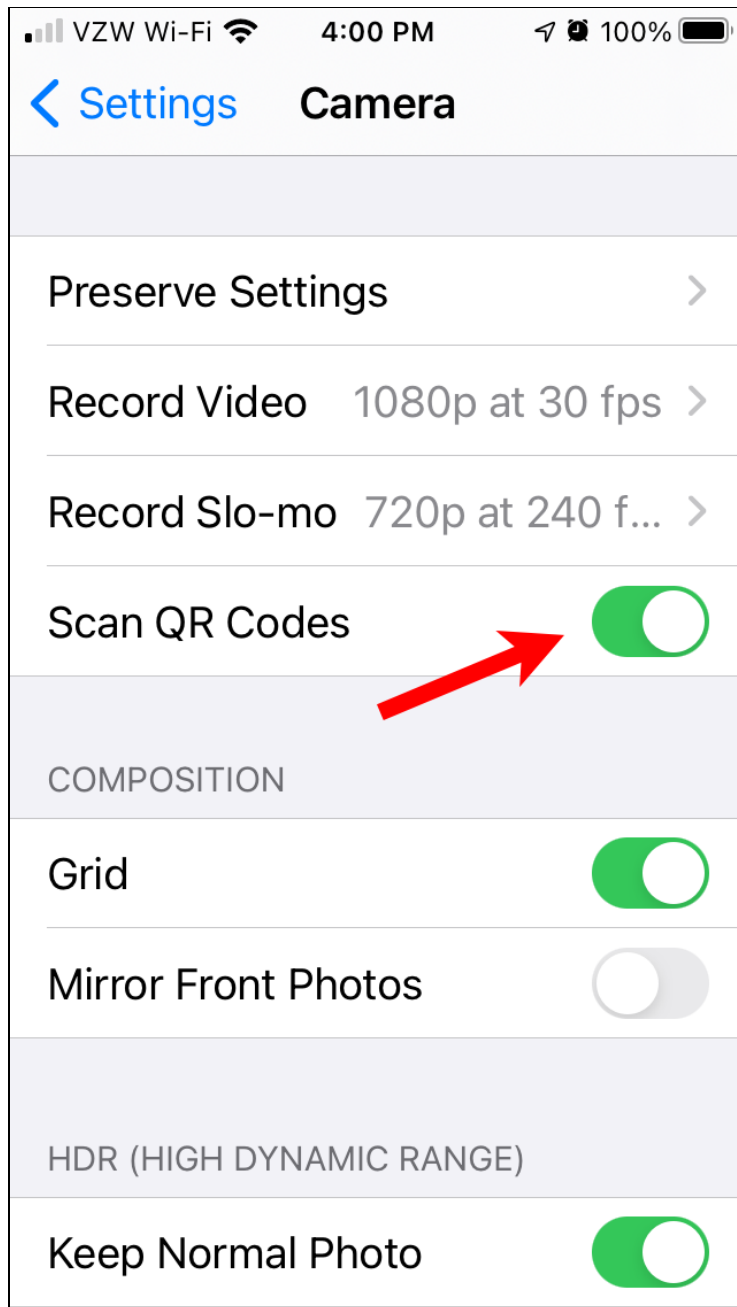They can store up to 7089 numeric digits or 4096 alphanumeric.

QR Codes can store various types of data:

- URL (browser link)

- Email Address (link to email client)

- Phone Number (dial, text message, save to contacts)

- Geo Location - latitude, longitude (find on map)

- Contact Information (save to contacts)

- SMS (send text)

- Text (free form text)

- Calendar Event (description, location, start/stop dates)
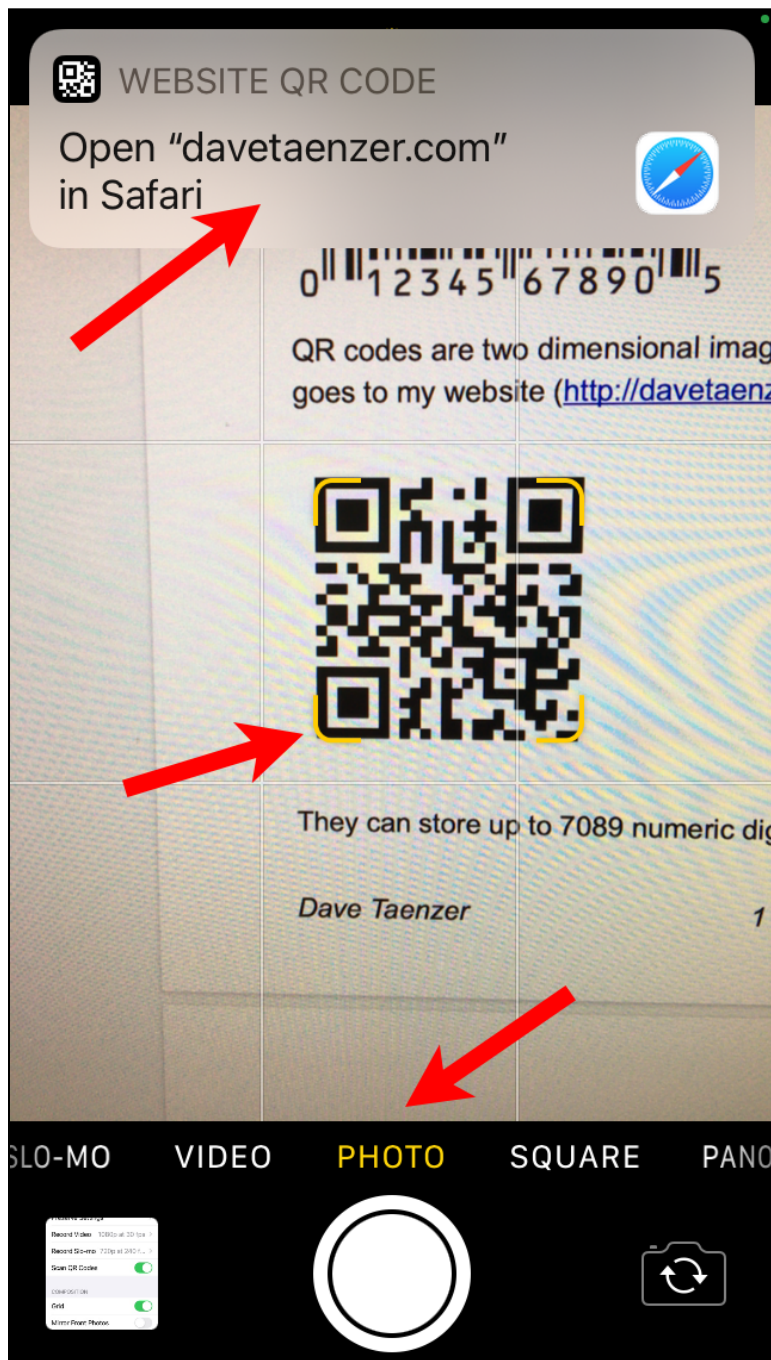
- Wifi Network (SSID, password)

QR codes can be easily read on smartphones. The Camera app on iPhones with IOS 11 or later will automatically read QR codes. QR codes can be read on Android with the camera app (on Android 9), Google Lens and various other QR scanning apps.

Another advantage of QR codes is they can be read from any angle and they also contain built-in error detection to avoid getting the wrong data from the QR code.

On the iPhone, you may need to go to the Settings app tap on Camera and make sure the QR scanning is enabled:

When you open your Camera app, make sure you are on PHOTO at the bottom, point your camera at the QR code. The code will show yellow corners and a popup notice will appear at the top of the phone. When you tap on that notice (in this case a website) it will open the website for the QR code in your default browser (e.g. Safari):
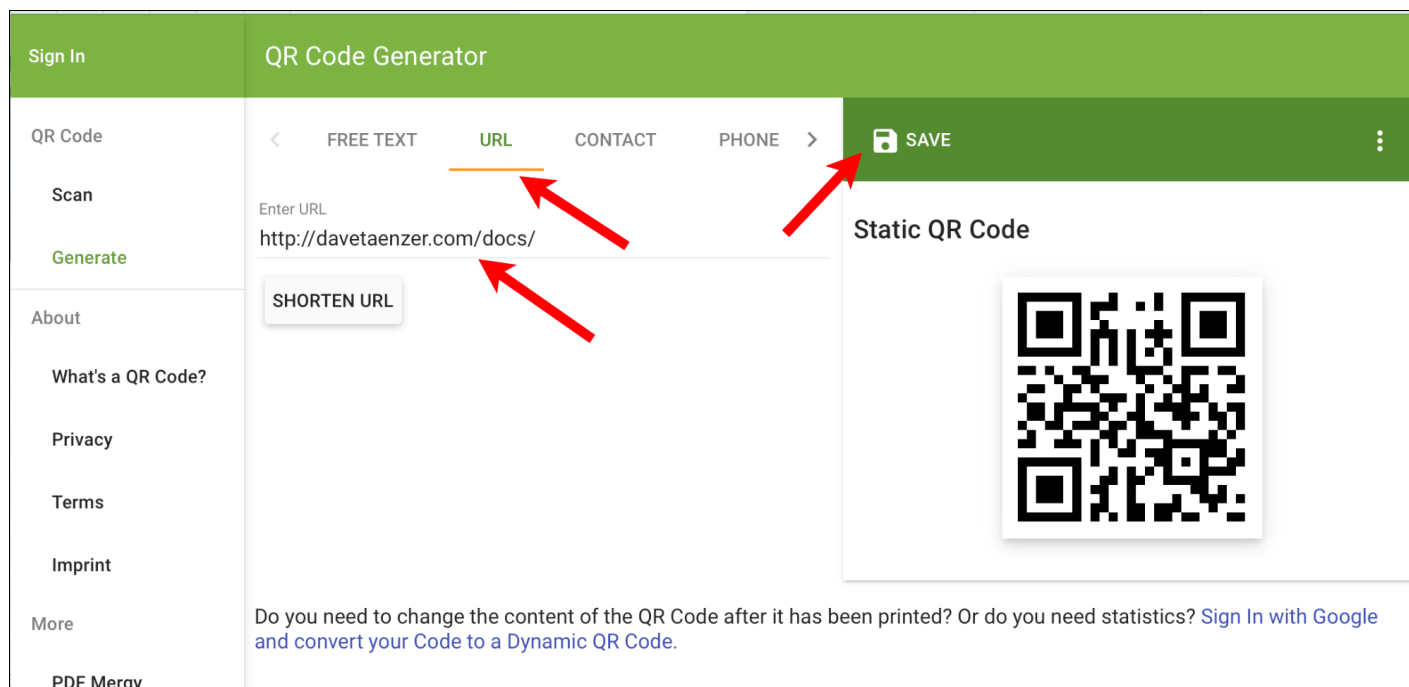
You can create QR codes on a number of on-line websites. There are two types of QR codes: static and dynamic. Static QR codes are free and can be used to create links to websites or a phone number to call.

Dynamic QR codes require a subscription for a QR code generator website. They are used for all the other types of QR codes (e.g. VCard for sharing a contact). One advantage of creating a dynamic code is that you can change it without having to update the QR code image. This makes them useful for business advertising.

A simple QR code generator website is

https://www.the-qrcode-generator.com

Which looks like this:

You select the type of QR code at the top (e.g. URL) and enter the data (e.g. the website address) then click the SAVE button to download the image file.

The main security issue related to QR codes is that they may take you to a malicious website. This is the same problem with phishing emails and similar scams.

To prevent this, take a close look at the popup notification that the smartphone renerates when you scan a QR code and only tap on it if you are sure it is safe.

Another option is to use a QR scanner app like Kaspersky QR Scan which automatically checks QR codes for safety. There is a link in the References section below which lists the best scanning apps.

Since static QR codes are free, you can try out some of the QR code generator websites and try out static codes for free. You could, for example, make up a paper contact list with QR codes for the phone numbers or a list of websites with QR codes to view them on your phone.

QR codes are a convenient way to quickly get to websites and other information. They are much easier to use than having to type a URL into a browser app, but you should use the same caution that you apply to email and websites. Make sure you only scan QR codes that you feel are legitimate and safe.

References

Introduction to QR Codes

https://www.nacha.org/system/files/resources/Introduction%20to%20QR%20Codes.pdf

QR Codes 101: A Beginner's Guide

https://www.qr-code-generator.com/qr-code-marketing/qr-codes-basics/

What is a QR code and how does it work?

https://www.qrcode-tiger.com/how-do-qr-codes-work

QR Code Types

https://www.qrcode-tiger.com/qr-code-types

Scanning QR Codes on iPhone video

https://www.youtube.com/watch?v=LMirtqYbpsc

Scanning QR Codes on Android Phones video

https://www.youtube.com/watch?v=pmM-hqUhmG0

7 best QR Code scanner apps for Android and iOS

https://blog.beaconstac.com/2019/09/best-qr-code-scanner-apps/

Free QR Code Generator *(there are many others)*

https://www.the-qrcode-generator.com

Free QR Code Generator With More Options

https://www.qrcode-tiger.com

QR Code Safety Issues

https://security.virginia.edu/QR-Hack