

What are QR codes and are they safe?



QR codes, also known as Quick Response codes, are two-dimensional barcodes that can be scanned using a smartphone, smart device, or QR code reader. QR codes are not new, and as with any other technology, they have their share of problems if they get into the wrong hands. QR codes were first invented in 1994 by the Japanese company Denso Wave and were used for labeling automobile parts. QR codes are comprised of a pattern of black squares on a white background. When you scan a QR code with your phone, it decodes the information and generally opens the product's website, social media pages, or downloads content.

During the height of the COVID-19 pandemic, there was an increase in the use of QR codes, which played a major role in various aspects of public health and safety measures. QR codes' ability to store and quickly retrieve vast amounts of data, including complicated web addresses that are challenging to write manually, is one of the primary justifications for their use. **QR codes have been used during the COVID-19 pandemic in the following ways:**

- **Contact tracing:** Many establishments required visitors to scan a QR code before entering. This was the predominant use of QR codes for contact tracing purposes.
- **Health Declaration/Test results:** QR codes helped event venues verify vaccination status before allowing customers to enter. Airlines and workplaces also used QR codes to verify COVID-19 results.
- **Health information distribution:** QR codes have made it possible for health authorities and government officials to quickly access health information and instructional materials on COVID-19.

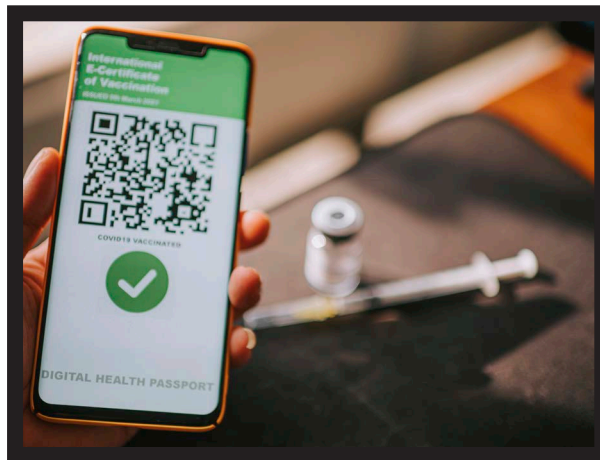
As the COVID-19 pandemic declines, businesses continue to use QR codes in the following ways:

- **Mobile Payments:** Preexisting mobile payment systems contain embedded QR codes. Users can initiate safe transactions and make payments directly from their mobile devices by scanning a QR code that is typically displayed on a website, at a point-of-sale terminal, or even on their televisions.
- **Digital menus and ordering:** Restaurants began using QR codes during the COVID-19 pandemic because they offered touchless menu options, which reduced the spread often caused by physical menus. Customers are able to scan QR codes to access a menu, place orders, and pay for orders from their mobile devices.
- **Marketing and Advertising:** Customers can use QR codes to quickly and easily access special deals, exclusive product content, and more by scanning a QR code that is displayed on packaging or printed materials and that directs the customer to social media pages, the product's website, or downloadable content.
- **Event ticketing:** Attendees of various events, venues, or transportation services can use QR codes saved on their mobile devices for seamless entry. Leading corporations such as Eventbrite, Ticketmaster, and airlines have embraced QR codes, providing their customers with a rapid and hassle-free ticketing option that simplifies the entry process.
- **Product tracking and authentication:** Due to the rise in product theft, QR codes are becoming more prevalent in inventory management and product tracking. Companies assign each product a specific QR code that is scanned at each stage of the supply chain to track its movement. Companies also use QR codes to combat the rise in counterfeit goods by verifying their authenticity.



- **Business cards and contact information:** QR codes can store contact information such as phone numbers, websites, and addresses. By scanning the QR codes on a flyer or business card, users can save the contact details to their address books.
- **Wi-Fi network access:** Users can connect to a Wi-Fi network without manually entering the network name and password by scanning a QR code with a smart device.

We have discussed how QR codes have assisted since the beginning of the COVID-19 pandemic and how they have offered convenience to our everyday lives. Like most great things, QR codes can have a negative side, which can pose certain security threats for users. **Here are a few common security issues associated with QR codes:**



- **Phishing attacks:** QR phishing attacks are also known as “QRishing, which occurs when a victim scans a malicious QR code that directs them to a phishing page intended to deceive them into divulging sensitive information or login credential. These phishing pages frequently imitate real websites, such as those for shopping or banking.
- **Counterfeit QR codes:** Cybercriminals can create counterfeit QR codes to replace the original codes placed by a legitimate business. When a victim scans the counterfeit QR code, the code redirects them to a phishing site or prompts them to download malware onto their devices without their knowledge.
- **Invasion of Privacy:** Cybercriminals can also gain access to a victim’s approximate location after the victim has scanned a counterfeit code. The cybercriminal can also alter the original code and add malicious software that provides them with the victim’s contact list and other data that can be sold to a third party. Additionally, scanning a QR code may cause the victim’s phone to call or text a number, which may then share the number with an unknown third party. Cyber criminals can access a user’s full name, address, email address, and social media accounts using online tools to mine internet



locations where user information might be publically available.

Here are a few ways that you can protect yourself from malicious QR codes:

- Exercise caution when scanning QR codes from unknown sources.
- If at all possible, locate and feel the QR code to see if a sticker has been placed over the genuine and original QR code.
- Verify the source and integrity of the QR code before scanning it by asking an employee of the business if the QR code is legit and preview the URL before following the QR code, especially in public places.
- Think twice about scanning QR codes located in public places especially if they appear to be randomly placed and not associated with a business.
- Use a secure QR scanner application that verifies the link against a list of known malicious links. The Android and Apple app stores includes a variety of scanner apps as well as user reviews to assist you in evaluating options. Ask your local IT department about which apps are considered safe and allowable on your government furnished equipment.
- If a QR code seems suspicious, report it immediately to the owner of the business where you discovered it.



If you have any questions about this article, please contact Cybersecurity@ihs.gov.

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