



Life of a QR code. To
scan or not to scan,
that is the question?

Warren Finch



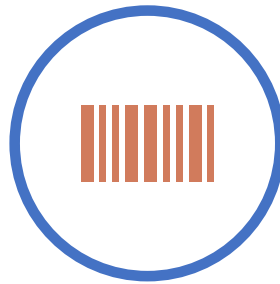
How to use QR code



QR Code



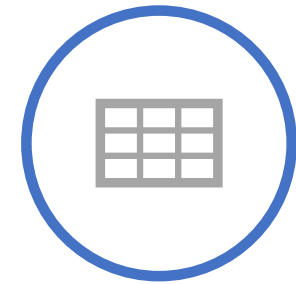
QR CODE IS AN ABBREVIATION FOR
QUICK RESPONSE CODE;







IT IS A TYPE OF 2-D BARCODE;



INVENTED IN 1994 BY A JAPANESE
AUTOMOTIVE COMPANY NAMED,
DENSO WAVE;



CONSISTS OF A SET OF SQUARE
DOTS ARRANGED IN A SQUARE
GRID PATTERN WITH WHITE BACK
GROUND.

		QR Code	PDF417	DataMatrix	Maxi Code
Developer (Country)		DENSO (Japan)	Symbol Technology (USA)	RVSI Acuity CiMatrix (USA)	UPS (USA)
Example					
Type		Matrix	Stacked Bar Code	Matrix	Matrix
Data Capacity	Numeric	7,089	2,710	3,116	138
	Alphanumeric	4,296	1,850	2,355	93
	Binary	2,953	1,018	1,556	-
	Kanji	1,817	554	778	-
Main Features		- Large Capacity - Small Size - High Speed Scan	- Large Capacity	- Small Size	- High Speed Scan
Standardization		- AIM International - JIS - ISO	- AIM International - ISO	- AIM International - ISO	- AIM International - ISO

Examples of 2D Barcodes

Rise of the QR code

- 2011 - 6.2% of people used a QR code in the USA
- 2016 - \$5.5 trillion paid with smartphones in China, compared to \$112 billion in USA. **WeChat Wallet** was only released in China in 2015
- 2017 - Visa, Mastercard and Amex combined to launch the world's first interoperable QR code acceptance system. That was in India.
- 2017 - EMV card payment specs, unveiled two QR code payment specifications – one for merchant-presented codes, one for and consumer-presented.
- Any camera phone can scan them, and the cost of displaying them for a merchant is virtually zero

<https://mobileecosystemforum.com/2017/08/31/scan-rise-fall-possible-rise-qr-codes/>

QR Code usage



Contact Information



Calendar Events



Email Address



Geo Location



Phone Number



SMS



Text



URL



WiFi Key



Micro QR Code



Frame QR

A QR 2D bar code as specified by [ISO/IEC 18004:2015]

QR code usage

- Autonomous vehicles / systems
- Payment systems
- Sharing information
- Ticketing systems



QR Codes could help homeless people in the UK

Amanda Giasson



Lost in Translation

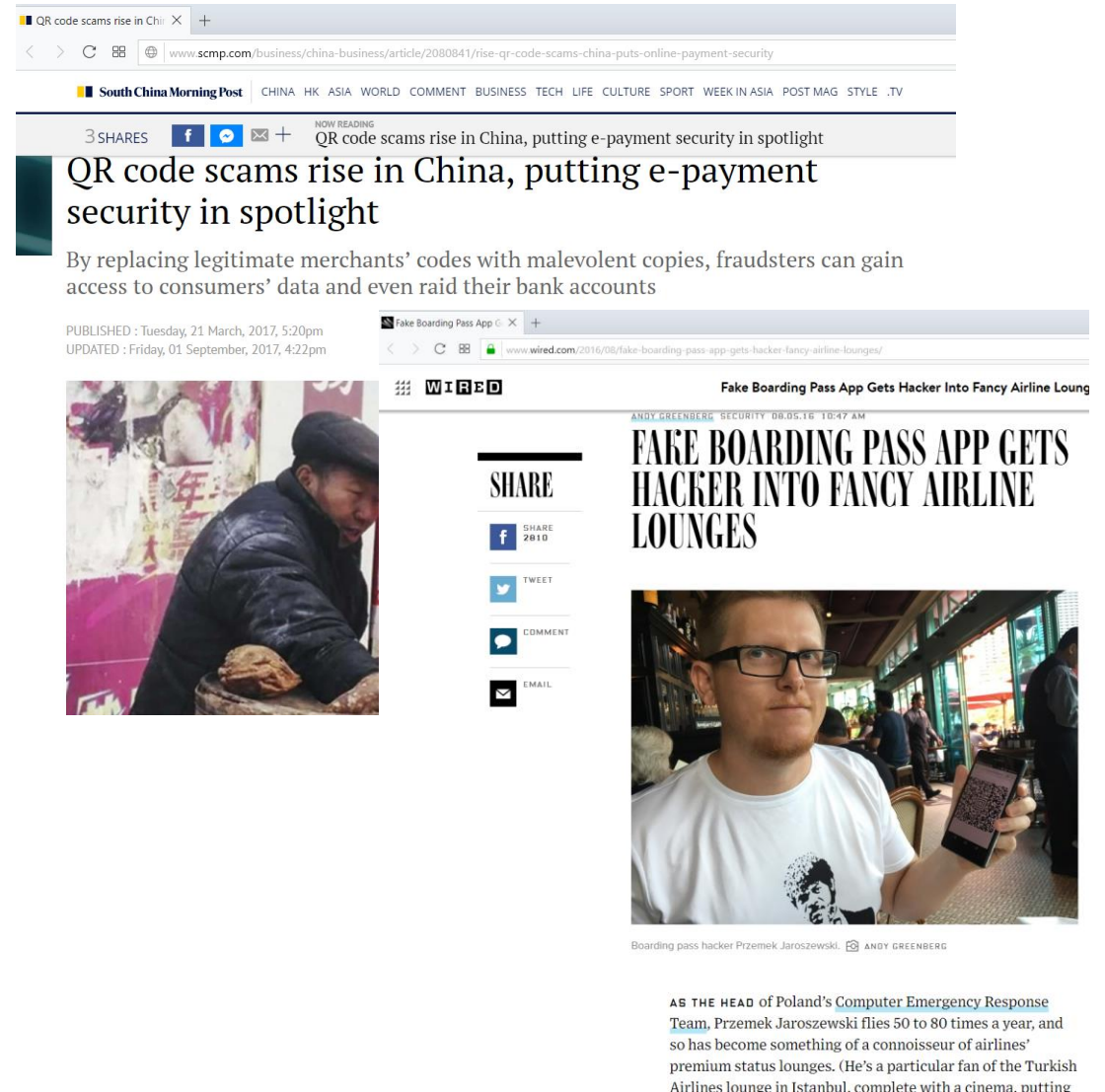


<https://myFakeWhatsApp.site>



Attack vectors / infection points

- Phishing attacks
- Malicious software distribution
- Redirect to malicious site
- [Physical Tampering](#)
- Replacing the QR code
- Impersonation



QR code scams rise in China, putting e-payment security in spotlight

By replacing legitimate merchants' codes with malevolent copies, fraudsters can gain access to consumers' data and even raid their bank accounts

PUBLISHED : Tuesday, 21 March, 2017, 5:20pm
UPDATED : Friday, 01 September, 2017, 4:22pm

FAKE BOARDING PASS APP GETS HACKER INTO FANCY AIRLINE LOUNGES

Boarding pass hacker Przemek Jaroszewski.

AS THE HEAD of Poland's Computer Emergency Response Team, Przemek Jaroszewski flies 50 to 80 times a year, and so has become something of a connoisseur of airlines' premium status lounges. (He's a particular fan of the Turkish Airlines lounge in Istanbul, complete with a cinema, putting

Attack vectors / infection points

MalQR is a collection of malicious QR Codes & Barcodes that can be used to test the security of scanners and applications

- SQLi
- XSS
- Command injection
- Fuzzing

<https://malqr.shielder.it>

Command injection



Attack vectors / infection points

- QRLJacking



<https://www.owasp.org/index.php/Qrljacking>

Attack vectors / infection points

- QRLJacking

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QRLJacking
#QRLJacker is a customizable framework to demonstrate "QRLJacking Attack Vector" and shows How easy to hijack services that relies on QR Code Authentication!
#A Social Engineering Attack Vector by: Mohamed A. Baset (@SymbianSyMoh)
#Coded by: Karim Shoair (@D4Vinci)

Vulnerable Web Applications and Services:
1.Chat Applications
2.Mailing Services
3.eCommerce
4.Online Banking
5.Passport Services
6.Mobile Management Software
7.Other Services
8.Customization
9.Exit

Choice > 1
1.WhatsApp
2.WeChat
3.Weibo
00.Back To Main Menu

Second Choice >
```

<https://github.com/OWASP/QRLJacking>

QrJacker - QrJacking Exploitation Framework

A python framework which goal is to exploit QrJacking attack vector easily

Requirements

- Python 2.7.x
- Requests
- Pillow
- Selenium

https://www.youtube.com/watch?time_continue=349&v=4QwyBXiZhG0

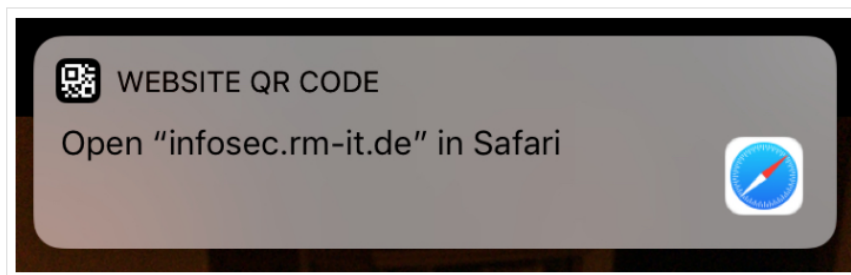
iOS camera QR code URL parser bug

Posted on [2018-03-24](#)

I've learned recently that the iOS 11 camera app will now automatically scan QR codes and interpret them.

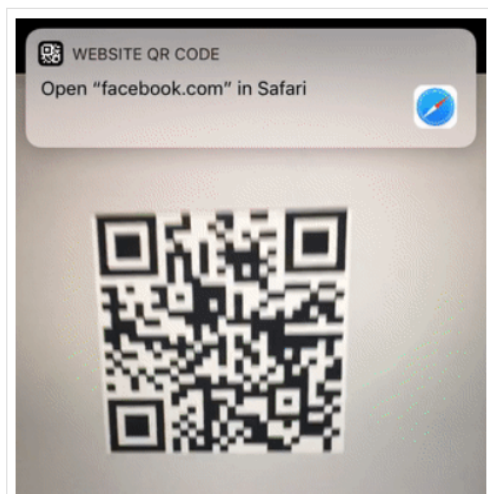
This is pretty cool, until now you needed special apps to do that for you on iOS.

When scanning a QR code which contains a URL – in this case <https://infosec.rm-it.de/> – iOS will show a notification like this:



Naturally the first thing I want to try is to construct a QR code which will show an unsuspecting hostname in the notification but then open another URL in Safari.

And this is exactly what I found after a few minutes. Here it is in action:



iOS camera QR code URL parser bug

`https://xxx\@facebook.com:443@infosec.rm-it.de/`

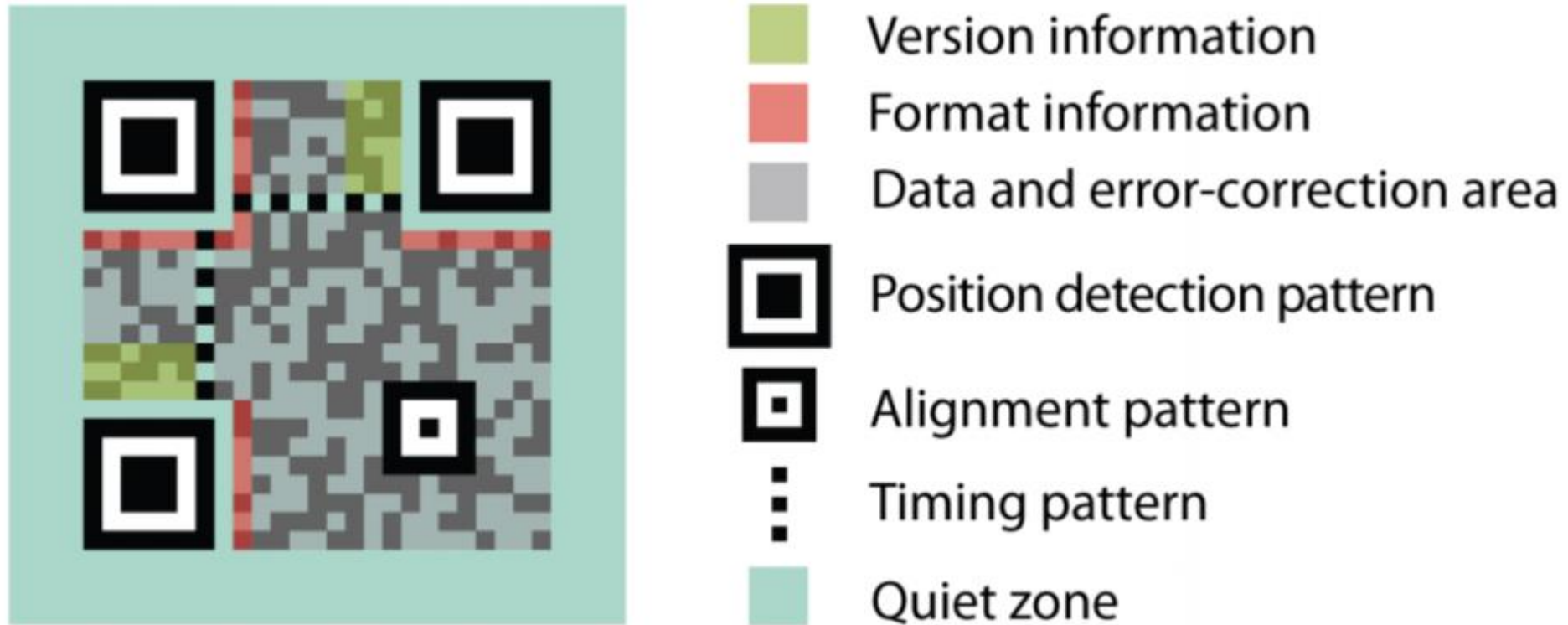
Creating QR codes

- Determine which encoding mode to use
- Encode the data
- Generate error correction codewords
- Interleave blocks if necessary
- Place the data and error correction bits in the matrix
- Apply the mask patterns and determine which one results in the lowest penalty
- Add format and version information

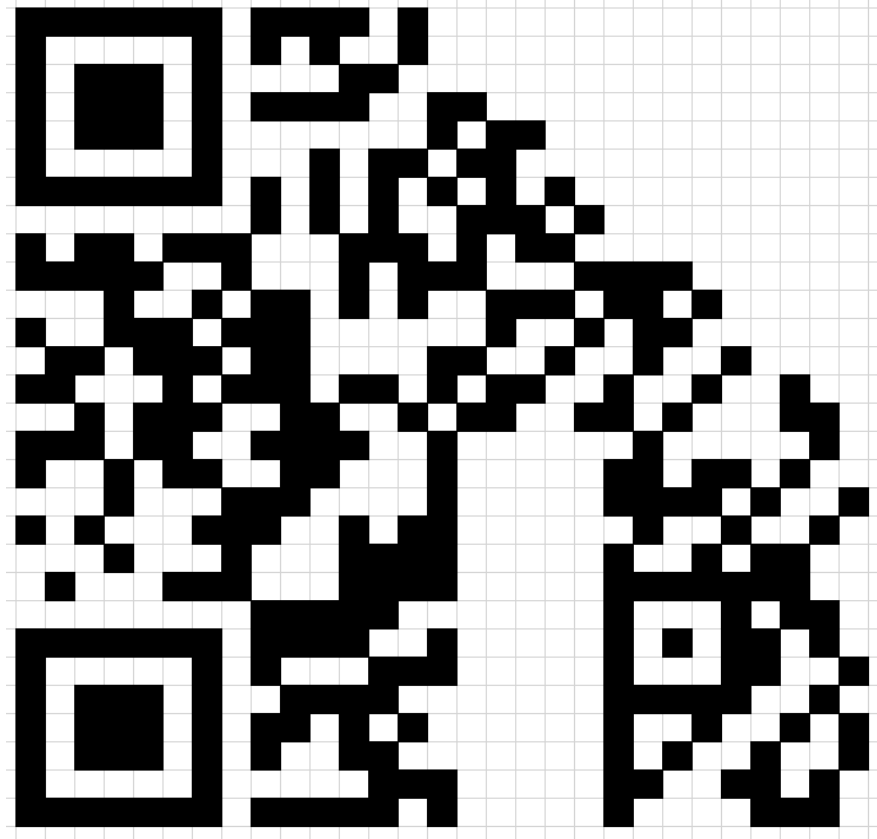
https://developers.google.com/chart/infographics/docs/qr_codes



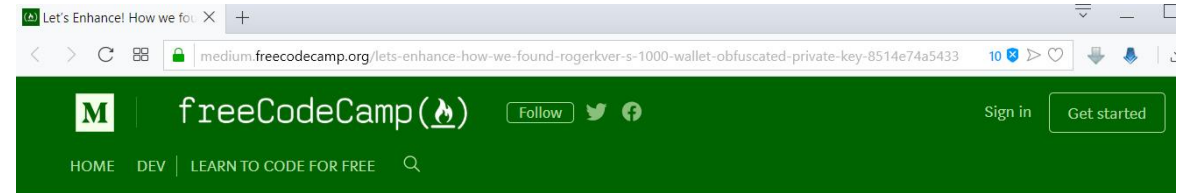
What makes a QR code



Rebuild a QR code



https://www.cyberchallenge.com.au/pdf/CySCA2014_Random.pdf



The intro

Last week France 2 broadcasted a documentary about Bitcoin. They interviewed @rogerkver who decided to offer \$1000 in Bitcoin to the quickest viewer. Unfortunately, the QR code and the private key were obfuscated by France 2.

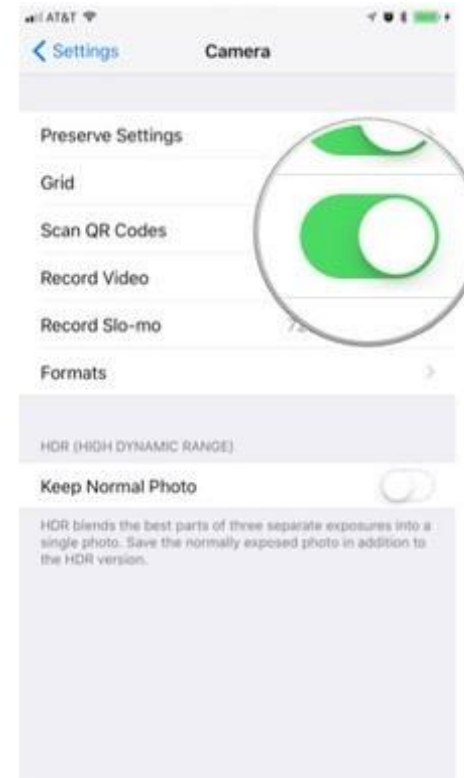


<https://medium.freecodecamp.org/lets-enhance-how-we-found-rogerkver-s-1000-wallet-obfuscated-private-key-8514e74a5433>

Protect Against Malicious QR Codes

- Observe before use
- Look at URL before proceeding
- Be suspicious
- Never give personal or login information
- Use a QR code scanner that has security features

Disable QR code scanning





Security features for QR Codes

Q Platform

SQRC

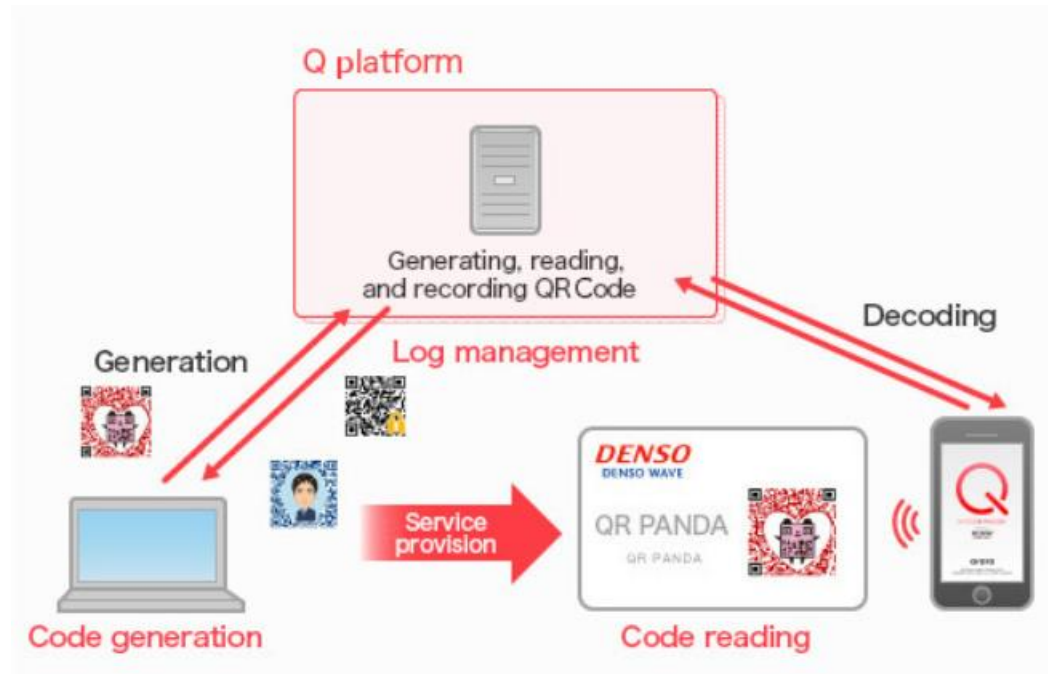
FrameQR

Q-revo trace

Q-revo protection

Q Platform

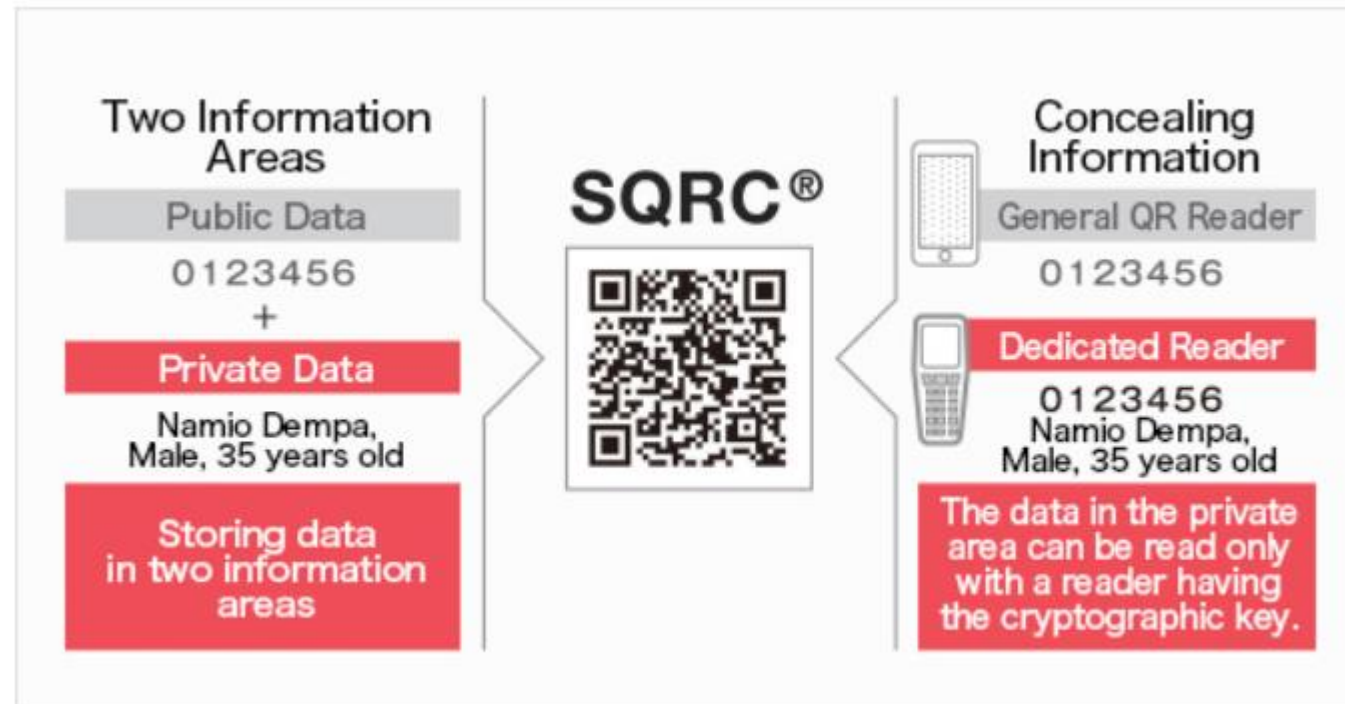
- A cloud server that generates, reads, and logs QR Code



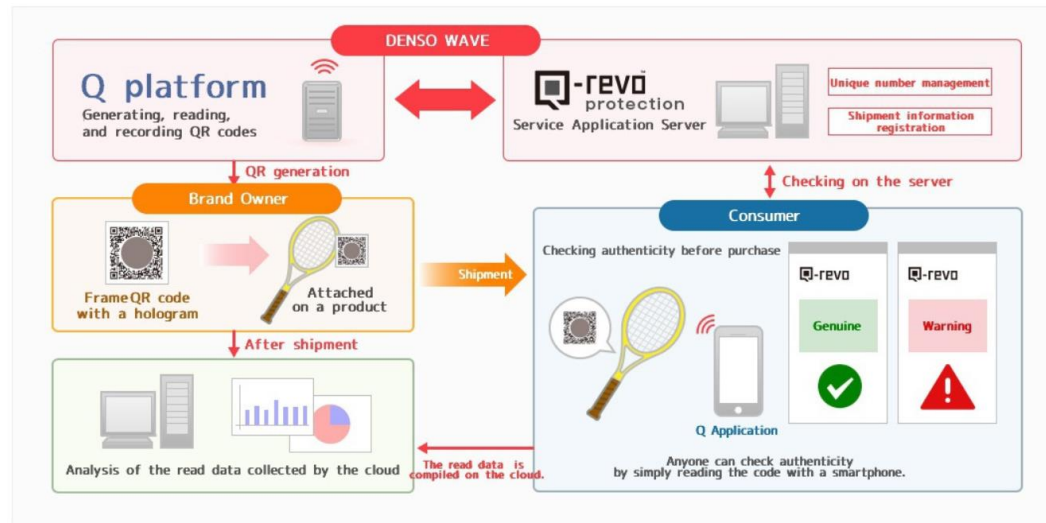
SQRC

<https://www.denso-wave.com/en/system/qr/product/sqrc.html>

- A single QR Code can carry public data and private data.



Cloud integration



- Q-revo protection
 - Checking authenticity
- Q-revo trace
 - Traceability service

FrameQR

- Released in Oct 2014
- A combination of a hologram and QR Code which can be used for anti-forgery measures and traceability.
- Is not compatible with normal QR Codes and requires different software to generate and read the codes



QR Code Reader “Q”

- To read the newer features, get the latest QR code reading software
 - <https://itunes.apple.com/jp/app/公式qrコードリーダー-q/id911719423?mt=8>
 - <https://itunes.apple.com/jp/app/%E5%85%AC%E5%BC%8Fqr%E3%82%B3%E3%83%BC%E3%83%89%E3%83%AA%E3%83%BC%E3%83%80%E3%83%BC-q/id911719423?mt=8>
 - <https://play.google.com/store/apps/details?id=com.arara.q&hl=ja>

Supported Smartphones	Android / iPhone (iOS 7 or later)	
Price	Free	
Supported Codes	2D codes	QR Code models 1 and 2 (GS1 format), Micro QR Code, SQRC, FrameQR, and MapQR
	Bar codes	AN-13, EAN-8 (JAN-13 and JAN-8), UPC-A, UPC-E, and UPC/EAN with add-ons