Industry Guideline MPM ShortQR

Front-end specifications

Australian Payments Network

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1   Introduction

1.1   Australian Payments Network (AusPayNet)

AusPayNet is the industry association and self-regulatory body for Australian payments. AusPayNet enables competition and innovation, facilitates industry collaboration and system-wide standards and co-ordinates the operation of Australian Payments Systems.

The Industry Guideline MPM ShortQR is a voluntary guideline setting out front-end specifications of MPM ShortQR. The aim of the Industry Guideline is to enable a consistent interface for the creation and scanning of ShortQR codes for payments and related transactions in Australia. The Industry Guideline is limited to front-end specifications. The Industry Guideline does not address back-end specifications including the exchange of transaction details and details of payment initiation, and it does not ensure interoperability with the back-end of the different ShortQR solutions.

The Industry Guideline ShortQR code is free to use.

1.2   ShortQR

ShortQR is a type of QR code that contains a reference to a resource where the actual information can be found or retrieved. In the scope of this guideline, the ShortQR is defined as follows:

- As a Merchant Presented Mode (MPM) QR code
- Contains a reference intended for payments
- Allows for Value Added Service transactions (VAS transactions) that are directly related to that payment. Examples are loyalty, receipts, vouchers, warranty etc.
- Contains information that the scanning device can use to retrieve payment details and related transaction information/details via a back-end interface (not via a website).
- Is scoped to dynamic QR only, meaning every QR code represents a uniquely identifiable transaction.
- Is different from the Long QR that contains all relevant payment and transactional data elements in the QR payload

1.3   Benefits of ShortQR

Benefits of ShortQR compared to 'Long QR' are:

- Functionality: Information exchange via the back-end interfaces of the Customer Service Provider and the Merchant Service Provider[1], allows for both sending and receiving of information between these actors. Since there is no limit on the amount of information that can be exchanged via the back-end channels, this creates an opportunity to use ShortQR for richer use cases.
- Performance: Low, limited data in the ShortQR code results in a reduced density of the QR. This makes it easy for screens to display the QR code clearly and for cameras to capture data from the QR code.

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[1] Or central platform provider, depending on the model

- Security: The QR code itself does not contain any information that can be used for malicious activity. The exchange of information via the back-end channel allows for improved security and access control to this data.

1.4 Terminology and terms

The Industry Guideline uses a few conventions when referring to specifications; see the table below.

Must	Defines a product or system capability which is mandatory within the Guideline
May	Defines a product or system capability which is optional or a statement which is informative only and is out of scope for this specification.
Should	Defines a product or system capability which is recommended.

Table 1 Terminology

1.5 Availability of Industry Guideline ShortQR

The Industry Guideline for ShortQR is available for use by any organisation interested in offering ShortQR code solutions.

2   Scope

2.1   In scope

The scope of this Industry Guideline is restricted to the following topics as part of the front-end specifications for dynamic MPM ShortQR codes:

- ShortQR Payload
- Branding
- Security aspects.

2.2   Out of scope:

The following items are out of scope of this Industry Guideline:

- The structure of the URL after the hostpath
- Specifications for registration of scanning applications to URLs on different mobile operating systems
- Model and specifications for the exchange of transaction details between back-ends of Customer Service Provider and Merchant Service Provider (or Central platform provider)
- Interaction between Scanning application and Customer Service Provider
- Interaction between Merchant PoS system and Merchant Service Provider
- Execution of related transactions, such as the payment initiation and loyalty processes.
- Onboarding and contracting processes between Customer Service Providers and Merchant Service Providers

3   ShortQR model and roles

Figure 1 describes the ShortQR model and the basic roles that are involved in a ShortQR transaction. The exact model can be different across different QR solution providers. Although the back-end interface/model is not in scope of this Guideline, a basic version is depicted in Figure 1 for illustration purposes. The roles in this model are independent: different entities can fulfil these roles, and one organisation can fulfil more than one role.
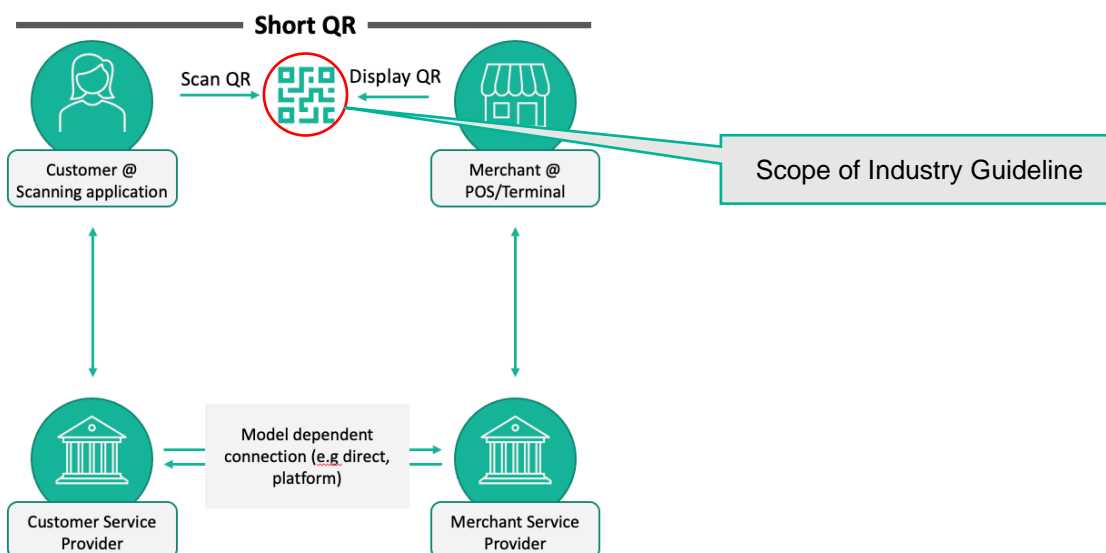

Figure 1: Basic ShortQR interaction model

The QR payload contains the reference that the Customer Service Provider can use to retrieve payment details and exchange other VAS transaction details with the Merchant Service Provider. These payment details can then be used to initiate a payment.

The payment process and VAS transaction will require other (existing) roles and processes to execute or complete the transaction (e.g. issuer and acquirer bank for payments, or separate loyalty providers), and these are outside the scope of this Industry Guideline.

3.1   Definitions of roles

#	Roles	Definition
1	Customer	A legal or natural entity that uses a Scanning Application to scan a ShortQR code to make a payment and possibly execute other transactions. A Customer uses a Scanning Application which is provided by the Customer Service Provider. The role of a Customer can be fulfilled for example by: • Consumer using an app on a mobile device to scan a ShortQR • Business representative scanning a ShortQR using ERP software
2	Customer Service Provider	The Customer Service Provider provides the Scanning Application to the Customer and has a back-end interface via which transaction details related to the ShortQR Code can be retrieved. The role of a Customer Service Provider can be fulfilled for example by: • Digital Wallet provider

#	Roles	Definition
		• Issuer • FinTech • Retailer
3	Merchant	A legal or natural entity that uses a ShortQR code to allow the Customer to execute a payment transaction and related transactions. A Merchant has a relation with a Merchant Service Provider that stores the transaction details and provides the back-end connection to allow Customer Service Providers to retrieve this information (directly or via a platform). The role of a Merchant can be fulfilled for example by: • Multi store retailer • Small retailer
4	Merchant Service Provider	The Merchant Service Provider provides QR related services to the Merchant such as storage of QR transactions and connectivity to the Customer Service Providers. **PLEASE NOTE**: depending on the QR model, part or all of these functionalities can also be fulfilled by a Central Platform Provider. So wherever in this Guideline a reference is made to the Merchant Service Provider, please read and/or Central Platform Provider The role of Merchant Service Provider can be fulfilled for example by: • Retailer • Acquirer • FinTech • POS terminal provider
5	Scanning Application	An application from a Customer Service Provider, which can be a mobile App or other form of application. In the case of a mobile App, the Scanning Application is distributed for example by the App Store, Play Store or other mobile operating system app-store. For other Scanning Applications, the control and distribution may be via another trusted provider. A Scanning Application is hosted by a Customer Service Provider that has onboarded with the Merchant Service Provider that was used for the creation of the QR code – during this process, the Scanning Application is registered by the Merchant Service Provider. The role of Scanning Application can be fulfilled for example by: • Mobile Banking App • Digital Wallet • Multi store retailer app • ERP scanning software
6	POS/Terminal	The device that the Merchant uses to display the ShortQR code to the Customer. This device has a connection to the Merchant Service Provider system to exchange ShortQR code transaction details
7	ShortQR code	A ShortQR code (Quick Response code) is a two-dimensional barcode. The ShortQR code is a dynamic QR code that contains a reference/link to a resource that holds the transaction details for the QR code. The structure of the ShortQR code must adhere to the specifications within this Guideline.

#	Roles	Definition
		The QR Code is a registered trademark of DENSO WAVE[2]

Table 2: Overview of basic roles in ShortQR

3.2   Generic ShortQR payments process

The different steps of a basic ShortQR payments flow are described here. The actual payment process is not part of the QR process and therefore that part is not described here. For illustration purposes the back-end process steps are also included here.

3.2.1   ShortQR process steps

1. Merchant creates a payment request
2. Merchant Service Provider generates a unique payment transaction ID and generates a QR code payload. This QR payload contains the transaction identifier
3. Merchant presents QR code to Customer
4. Customer scans QR code with their device
    4.1. Customer uses Scanning Application to scan QR code (continue from step 5)
    or
    4.2. Customer uses native camera to scan QR code,
        4.2.1.   Scanning Application opens (continue from step 5)
    or
    4.3. Customer uses native camera to scan QR code, but no Scanning Application that is associated to the QR code URL is available on the device
        4.3.1.   Landing page opens
        4.3.2.   Customer can proceed to download Scanning Application (continue from step 4)
5. Customer Service Provider receives QR payload data from Scanning Application
6. Customers Service Provider requests payment details from Merchant Service Provider based on the URL in the QR payload and the payment transaction ID
7. Merchant Service Provider returns payment details associated with the transaction ID to Customer Service Provider
8. Customer proceeds with payment process (out of scope).

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4   QR payload requirements

4.1   General principles

This ShortQR Industry Guideline relies on the following general principles for the QR payload:

- The QR code represents a URL structure. This allows Customers to scan the QR code using their native camera. Alternatively, the Customer can first open the Scanning Application and then scan the QR code
- Using the native camera to scan the QR code will trigger either the internet browser app (e.g. Safari) or a pre-installed Scanning Application
  - o For the Scanning Application to be triggered, the Customer Service Provider should follow the implementation guide of the device Operating System (OS) e.g Apple iOS or Android. In general the following rules apply: the Merchant Service Provider associates the Scanning Application's unique app ID to the URL of the QR (this can be done for multiple apps on the same URL) and the Customer Service Provider adds code to its app to respond to the URL (this can be done for multiple URLs in one app).
  - o If the Customer has more than one suitable Scanning Application installed on their device, the device's operating system will prompt the Customer to select the application of choice
  - o When no Scanning Application is available on the Customer's device, the internet browser app will be opened to visit the landing page using the QR Code URL.
- The landing page must provide the following information:
  - o Explanation of why the Customer is seeing this page (e.g. 'App is required to proceed with this transaction. Please download the App from app-store')
  - o Information on Scanning Applications that can be downloaded via trusted stores

4.2   QR structure and payload

4.2.1   URL structure and requirements

- The QR code represents a URL string which has the following functions:
  1. Uniquely identify the Merchant Service Provider
  2. Provide the Universal Link to either trigger a Scanning Application or route to a webpage
  3. Uniquely identify the transaction
- The hostpath of the URL must be:
  - o https://[Merchant Service Provider]/
  - o Using https is based on best practice recommendations for the use of universal links to protect users' privacy and security[3]
- The hostpath must be used by the Customer Service Provider
  - o As a Universal Link registered in the Scanning Application, so it triggers launching of the Scanning Application when the Customer uses the native camera to scan the QR

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[3] E.g. https://developer.apple.com/library/archive/documentation/General/Conceptual/AppSearch/UniversalLinks.html

- o   To Uniquely identify the Merchant Service Provider (or central platform, depending on the model), so that the Customer Service Provider can place the API call to the correct back-end service of the Merchant Service Provider
- The URL must contain a Transaction identifier to uniquely identify the transaction. The Guideline only describes that the URL must contain this identifier. The implementation can differ per Merchant Service Provider.
- The structure of the URL after the hostpath is out of scope for this Industry Guideline. This offers Merchant Service Providers maximum flexibility to use their preferred structure. Customer Service providers must refer to the specifications of the Merchant Service Provider in case they wish to understand the exact URL structure after the hostpath.
- The URL may contain additional information if this is functionally necessary for a specific QR solution (e.g. information on other relevant actors) but this should be kept to a minimum. Confidential and other sensitive information must never be included in the URL string.
- The maximum length of the URL is not specified by this Industry Guideline. URL length should be kept to a minimum to ensure the data in the QR Code is lean. This improves scanning performance and suitability for low-resolution displays.
- The URL must not be encrypted. There are no encoding requirements.

4.2.2   Payload

The table below provides more information on the mandatory fields of the URL.

Field	Format	Length	Value	Presence	Comments
Merchant Service Provider	AN	Unspecified	Unspecified	Mandatory	This is the domain name of the Merchant Service Provider (or central platform provider, depending on the model) that provides the API endpoint and hosts the landing page of the URL.
TransactionID	AN	Unspecified	Unspecified	Mandatory	This identifier refers to a unique transaction at the Merchant Service Provider (e.g. end-end ID, SessionID, Code). Parties can either use direct values or a value that can internally be resolved to a specific transaction.

Table 3: Specifications mandatory fields in URL

4.3   Security

Since the retrieval of the underlying transaction information is via a secure back-end channel instead of directly via the QR code, the ShortQR security relies on this design. The Guideline has no additional front-end security requirements, other than the aforementioned requirements to never include confidential and other sensitive information in the URL string and to make use of https in the URL.

5   Branding

5.1   Merchant QR Code Readability

Good readability of the QR has a positive influence on Customer acceptance, and therefore parties creating ShortQR codes should consider the following factors that improve readability:

- Test the QR readability with a wide range and representative set of devices.
- For QR codes on digital displays, the contrast ratio and resolution should be considered for readability.
- The angle the Customer can make to scan a QR is important to the readability as well. The Merchant should be encouraged to install the QR display terminal in an optimal position for the Customer to scan the QR code.
- QR Code has error correction capability to restore data if the code is dirty or damaged. For ShortQR, error level H is recommended, which means that approximately 30% of codewords can be restored.
- It is recommended to keep the size of QR data to a minimum to increase the readability and scanning performance of the QR.

5.2   Use of logo's

Use of logos for individual QR solutions is recommended to help Customers recognise trusted brands. Merchant Service Providers are recommended to use a trust mark for their QR solution. Customer Service Providers could add the logos of the QR solutions they've onboarded with, to their scanning application. This will help Customers recognise whether their scanning application supports a QR code when it is presented at a Merchant.