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# NepalQR Standardization Framework and Guidelines

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Nepal Rastra Bank  
Payment Systems Department

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February 2021

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**Abbreviations**

<b>S.N.</b>	<b>Abbreviation</b>	<b>Full form</b>
<b>1</b>	CVV	Card Verification Value
<b>2</b>	KYC	Know Your Customer
<b>3</b>	KYM	Know Your Merchant
<b>4</b>	MDR	Merchant Discount Rate
<b>5</b>	OS	Operating System
<b>6</b>	OTP	One Time Password
<b>7</b>	P2P	Person to Person
<b>8</b>	PIN	Personal Identification Number
<b>9</b>	PSO	Payments System Operator
<b>10</b>	PSP	Payments Service Provider
<b>11</b>	QR	Quick Response
<b>12</b>	UI	User Interface
<b>13</b>	UX	User Experience

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## **Acknowledgement**

Nepal Rastra Bank, Payment Systems Department would like to take this opportunity to acknowledge all involved in finalizing this document, specially to International Finance Corporation (World Bank Group) for their technical assistance.

## 1. Background

Nepal Rastra Bank (NRB), the Central Bank of Nepal and Regulator of the Payment system of the country defines the regulatory framework, and is responsible for the supervision and oversight of the authorised entities in the ecosystem. It is also responsible to develop Tech led innovations to bring in operational efficiency and minimise cost. Thereby, promoting digital payments and increase its adoption.

In payment industry, a change can be observed in consumer behaviour: the payments landscape in Nepal is shifting gears from cash to Digital mode. A digital payment brings in ease and convenience to the consumer and is therefore responsible for its growth and adoption. The new age Start-ups and Fin Techs are largely responsible for popularising Digital payment trend. These entities have identified many industries need and provided innovative solution. One such Payment innovation trending the retail space is QR payments. Quick Response (QR) code payments are an alternative to cash or debit/credit card payments. It is an excellent alternative to cash/ debit/ Credit card payments.

## 2. Importance of QR codes across the globe

With improved digital infrastructure like internet & growing number of smart phone users, the adoption of QR based payments is only poised to grow. Incidentally, the present pandemic situation reeling with the ‘fear of proximity’ and ‘need for distance’, drives the need of low-cost contact-less payment mode, and QR codes are the best suited to address this challenge.

We’re seeing increased adoption of QR based payments around the globe, with emerging economies like China and India spearheading the movement. It is gaining traction in other developing economies as well. We have observed several QR initiatives in Ghana, Brazil, Singapore, Japan and a host of other countries.

The main reason for such uptake has been the acceleration of digitization of economies that QR codes bring about. As low-cost solutions like QRs are easy to adopt countries are able to leap frog the plastic era in digital payments and bring their merchants and individuals online faster. Implementation of QR codes for payments have been found to directly impact and promote the growth of any nations GDP. <sup>1</sup>

## 3. Need for Standard QR in Nepal

QR is emerging as preferred mode of payments amongst consumers and merchants equally. Wallets are largely responsible for popularising mobile payments across globe and have greatly influenced the consumer’s behaviour to scan QR for payments. In Nepal too, many licensed PSOs have embarked this journey and popularised this payment trend.

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<sup>1</sup> A study by the China ICT institute in May 2020 points out that WeChat directly and indirectly contributes to about 9% of China’s GDP and has helped create about 35 million jobs. This has been possible only because of the network effects that a single QR implementation has.

Whilst this market/ industry led trend of QR payments has its advantages, there have been undesirable impacts leading to inequitable situations too. Most of these QR providers are closed loop i.e., QR codes developed and deployed by these providers can be scanned and paid by using their consumer apps only, therefore non-interoperable. So, if a customer wants to use a phone to pay at multiple retailers – acquired by multiple providers– he or she would need to download and manage separate apps – Overhead and an inconvenience to consumer.

As the payment ecosystem matures and the number of payments systems operators/providers proliferate there is an increasing threat of an imbalance. It therefore becomes necessary to develop standards to bring in uniformity and provide equal opportunity for all players in payment space. This standard provisions for three major payment principles - **Interoperability, Scalability and Security**.

It is therefore proposed to have prescribed Standards for QR codes and design a framework for its implementation and usage.

## 4. Framework for QR based payments

This section defines the broad framework for QR payments in Nepal. Based on the provider's role in the QR payment lifecycle, the framework shall be suitably applicable. All the guidelines, procedures developed by Scheme/Networks should follow related NRB directives/circulars.

### 4.1 Definitions

For all intents and purposes the following have been defined as parties to a QR code-initiated transactions:

- 1. Acquirers:** are the financial institutions or the payment service provider (e-money operators), responsible for enrolling merchants, assigning merchant IDS, maintaining merchant records/accounts and settling merchants. They are the network members who create and owns merchants.
- 2. Customers:** are the individuals or entities using Issuers' Application for NepalQR based payment services.
- 3. Issuers:** are the network members who create and owns customers and facilitate payments from current accounts, savings accounts, mobile based e-money accounts and cards.
- 4. Merchant:** are entities registered with acquirers who accept NepalQR based payments .
- 5. Network Members:** are Banks and Financial Institutions (BFIs), Payment System Operators (PSOs), Payment Service Providers (PSPs), other service providers, and their successors and assigns to join the network under the terms and conditions stipulated in the respective membership agreement to provide the service under the particular network to their customers and/or agents.
- 6. Payment System Operator (PSO):** Are the entities licensed as PSO by NRB.
- 7. Payment Service Provider (PSP):** Are the entities licensed as PSP by NRB.
- 8. QR Code:** As defined by EMVCo, a QR Code is an ISO 18004-compliant encoding and visualization of data. "QR Code" is a registered trademark of DENSO WAVE.
- 9. Scheme/Network:** means a shared payment network developed and managed by Payment System Operator (PSO) which allows transactions and payments routing among and within its members.

## 4.2 Eligibility for Scheme/Network

Licensed Payment System Operator (PSO) will be eligible to operate QR Scheme/Network under NepalQR.

A PSO must seek approval from NRB for starting service under NepalQR.

## 4.3 Eligibility for Acquiring and Issuing.

The merchant acquiring and issuing can be done by Bank & Financial Institution and Payment Service Providers (PSPs) licensed by NRB.

## 4.4 Major Responsibilities of Scheme/Network:

1. Scheme/Network shall maintain, upkeep and manage the infrastructure and technology components; prepare and implement necessary business continuity plan (BCP) to ensure that the Network is not disrupted or services are not suspended at any point of time.
2. Scheme/Network shall prepare mechanisms, policies and procedures for the settlement of disputes between the individuals/parties involved in transactions and enforce them throughout the network and participants.
3. Scheme/Network shall settle the transaction and provide the transaction reports, fees and charges details, fee sharing reports and settlement reports to the network participants through secured media for timely reconciliation of accounts of all the participants involved in the respective transactions.
4. Scheme/Network shall provide necessary system interface and support to the participants to integrate and operate under the Scheme/Network.
5. Scheme/Network shall prepare necessary operating procedures, rules and regulations regarding the transaction settlement and reconciliation; fees and charges; duties, rights, liabilities and remedies of each individual involved in the transaction and it shall be the responsibility of all the participants to follow and abide by all such operating procedures, rules and regulations of Network/Scheme.

## 4.5 Major Responsibilities of Acquirer:

1. The Acquirer must ensure to undertake KYC and prescribed due diligence for all merchants on-boarded.
2. If the acquirer provides for instant on-boarding convenience, the acquirer must ensure to impart requisite training to merchants and ensure the KYC and merchant on-boarding guidelines are not compromised at any point of time.
3. Prior to entering into a Merchant Agreement, an Acquirer shall ensure that the Merchant are registered entities as per prevailing laws. In case of sole proprietorship, an arrangement can also be made to accept the payments in merchant's saving accounts. However, KYC status of those accounts should be intact.
4. Merchant on-boarding process shall at minimum include the following steps:
  - a. Pre-screening
  - b. Identity verification/KYM
  - c. Business review of merchant
  - d. Assurance that the merchant shall keep customer data confidential
  - e. Merchant agreement

Acquirer may seek additional documents with merchants to be stringent while screening and approval terms.

Additionally, for online Merchants (someone who sells products or services exclusively over the Internet) including E-commerce Merchants, review of following aspects shall have to be conducted by the acquirer:

- a. Secure network, system and applications
  - b. Transaction/customer data to be encrypted during transmission
  - c. Implementation of vulnerability management program
  - d. Restrict access to customer data based on “Need to Know and Right to Know”
  - e. Implementation of access controls
  - f. Tracking and monitoring all access to network resources and customer data
  - g. Regular testing of security systems and processes
  - h. Maintenance of information security policy
  - i. Content of website and merchant information standards
  - j. Name displayed on website matching merchant description
  - k. Privacy policy
  - l. Products offered for sale
  - m. Links to other sites
  - n. Minimum website data security requirements for payment purposes following international best practices
- 5.** The QR provided by the Acquirer must at all times be compliant to the QR standards prescribed by the NRB.
  - 6.** The provider shall solely be responsible for the transactions initiated by the merchant – similar to the guidelines prescribed by the respective Scheme/Network.
  - 7.** The Acquirer must provide the marketing name of the merchant in the QR or by means of API to the App provider.
  - 8.** In case of Aggregated means (via third party acquirer) of merchant on-boarding; the name of the end merchant rendering goods/services; customers point of contact must be translated to the App provider.
  - 9.** The Acquirer must ensure to populate the requisite Merchant Category code (MCC) to identify the business of the merchant.
  - 10.** In case of Aggregated means (via third party acquirer), the Acquirer must ensure to populate the Merchant Category code (MCC) of the end merchant rendering goods/ services.
  - 11.** The onus and accountability of populating the Merchant name and MCC lies with the Primary acquirer, therefore any dispute/risk/fraud arising on account of negligence of the aforementioned requisites shall be the responsibility and borne by the primary acquirer.
  - 12.** The acquirer’s merchant module must comprise of the following major suite of services based on the infrastructure of the merchant:
    - a.) Transaction status – A confirmed status of the transaction; Success or Failed
    - b.) Payment status – Status of payment credit to his account
    - c.) Check transaction status – A facility to verify the status of the transaction; in case of no confirmation on payment or transaction
    - d.) SMS/notification for every transaction – Confirmed message to assure the merchant of transaction for successful transactions

- e.) Menu options for viewing transactions history
- f.) Helpdesk service
- g.) Instant refund facility
- h.) Activity log
- i.) Respond to Dispute/ Complaint - With option to upload any proof or document related to dispute/ complaint
- j.) Disputes settlement status tracking facility

#### **4.6 Major Responsibilities of Issuer:**

1. The Issuer shall be responsible for facilitation of QR scan to the customer.
2. The Issuer shall make honest attempt to communicate the QR scan feature to customer and prominently place or locate, preferable on the home page, such that it is easily accessible and used by the customer.
3. The Issuer shall present the parsed information of the QR in a UI format with the mandatory parameters such as merchant name, transaction amount etc. and any other parameter requiring customer inputs such as tips, remarks etc.
4. The Issuer application shall scan the QR, parse all the parameters of the QR and provide the customer with all the registered payment options on the app. The app must offer the customer the right to choose his/ her preferred payment option.
5. The Issuer shall not patronise any payment mode or scheme or mandate the customer to choose any particular mode/ scheme.
6. The Issuer shall design an intuitive UI or build in prompts such that the customer is conscious and fully aware of the actions of authorisation (e.g. PIN input) and subsequent debit to his account.
7. The Issuer must provide for the following;
  - a. Transaction confirmation page: Post authorisation (e.g. PIN input), the subsequent page must display the status of the transaction to the customer with transaction reference number
  - b. Notification for every transaction or activity initiated by the customer – Confirmed message to confirm the status of transaction; both Success or failed transaction; change of status in Dispute or Complaint.
  - c. Summary of transaction: An option providing for a summary of transactions with beneficiary name and requisite details for the customer to raise dispute.
  - d. Transaction enquiry page: The customer can check the status of transaction.
  - e. Option to raise a complaint and dispute
  - f. Complaint/ Dispute status: Intuitive UI indicating the status or stage of complaint/ dispute raised with final closure status.
8. The Issuer must provide a customer service number and must prominently display the same on the app.
9. The Issuer shall take explicit customer consent for using the transaction data and record the same in the Terms of Services.

#### **4.7 Fees and Charges:**

1. No charge shall be levied on the customer for QR code-initiated transactions unless exclusively allowed by NRB. Acquirers are strictly advised to make sure that the merchants do not recover full/part of MDR from the end customer.
2. Charges may be levied on merchants in the form of a MDR. Merchant Acquirers shall ensure that the lowest possible MDR rates prevail in order to encourage faster and widespread adoption of QR Codes in Nepal.

3. Initially, NRB may allow market forces to determine the MDR thus creating a healthy competition among Acquirers, and if required, NRB may intervene in order to regularise and stabilise the MDR.

## **4.8 Settlement Mechanism**

The Issuer and the Acquirer shall be guided by the Operating guidelines prescribed by the respective scheme/network for Settlement and Dispute management. The settlement framework would cover the mechanism to address smooth settlement. The following process indicated is an illustration.

### **Broad overview of the Settlement & reconciliation process**

This section outlines the procedures for settlement, a process by which a central network/any other such nominated entity, as the settlement agency, would credit/debit from the members' settlement account maintained as per NRB regulations, the amount as per the summary level data it receives from the central switch/Network.

1. The Network calculates the net debit/credit position based on the total netting of acquiring, issuing transactions and adjustments for a particular member.
2. In case of net debit, the member has an obligation towards other members. Thus, it owes the amount equal to the net settlement amount to other members in the network. During the settlement process, the network debits the member which is under net debit, and credits the member under net credit. To affect this, the net debit member should hold sufficient funds in its settlement account.
3. Members should therefore ensure to fund the settlement account with sufficient amount to meet the settlement obligation sent by the Network. Members should periodically review daily settlement amount trend and ensure to fund their settlement accounts to avoid the out of fund situation.
4. The network will arrive the settlement amount and will post settlement amount through the settlement account.
5. At the end of each cutover time and completion of Settlement File generation, Net Debit Credit (NDC) limit would be refreshed, the net receivable or payable of each member would be generated, and a daily settlement report would be prepared and made available to all members through secured means.
6. In the event of shortfall in the account of the member at the time of settlement, the settlement would be as per the process laid down to address such scenarios in the rule/regulations of the respective scheme/network.
7. For the purpose of reconciliation, the members will have to compare the report provided by the network with the report generated by members' switch & core banking system.
8. Any differences, identified during the reconciliation process, should be addressed by the members through Scheme/Network's dispute and settlement guidelines.

## **4.9 Risk and Compliance**

1. All transactions initiating on QR must follow the Fraud and Risk management protocol similar to other legit payment modes.
2. The issuer and App provider must build velocity checks at interface level to mitigate unwanted transactions or fraud.
3. The issuers & App providers could introduce velocity & value limits in the system to mitigate frauds.

4. The issuers & App providers should provide for online fraud reporting mechanism with capture and process requisite information pertaining to fraudster, to be referred & perused by the ecosystem for potential miscreants.
5. The app providers & Issuers must develop competencies to identify frauds through the usage patterns and taking appropriate measures to mitigate such risks. For e.g. multiple transactions within a very short span of time, changes in geolocation, frequent incorrect entries in case of generating PIN, OTP or passcode.
6. Apps taking geo-location based on consumer consent, the same may be passed on and be made available to the Issuer.
7. All the stakeholders in case of any major cyber-attack/fraud shall notify NRB as soon as possible.
8. All schemes/networks shall abide to NRB's guidelines and any circular/directives as applicable. In addition to that, participants shall also follow and comply with Operating guidelines issued by Scheme/Network from time to time.
9. All participants shall adhere to regulatory compliance towards various laws i.e. Payment & Settlement, IT, Prevention of money laundering etc.
10. All schemes/networks shall submit annual compliance assessment to NRB.

#### **4.10 Customer Service, Grievance Handling and Dispute Management**

1. The Issuer must provision for customer to raise dispute or complaint from the app and ensure complaint management process as per the operating guidelines prescribed by the respective scheme/network.
2. The Issuer must provision for customer disputes arising out of these methods of payment and design a process to address complaints raised through these channels.
3. The Acquirer must honour and facilitate a mechanism to handle complaints & dispute arising through the QR channel. They must explicitly provision for these in terms and conditions and binding agreement with merchant.

#### **4.11 Information Security Program**

1. Security test and security audit of the Application being used for QR Code based payment must preferably be conducted by Issuer.
2. Use of encrypted and signed API instruction between issuer, banks, network or any other participant involved must be ensured.
3. Any Personally Identifiable Information (PII) data should not be stored in the device.
4. Merchant name and masked credential must be displayed in the app after scanning a QR, to enable safe transactions.
5. App should allow customers to have deeper understanding of security.
6. Scheme/Network should prepare Information security guidelines including but not limited to the following and mandate compliance to the same
  - a.) Data Storage
  - b.) Data Encryption
  - c.) Channel Encryption
  - d.) Infrastructure Security – Annually
  - e.) Source code review (Front-end & Back-end) – Annually
  - f.) Application Security - Annually
7. The Issuer must do the needful to assure the following
  - a.) Ensure the security and confidentiality of Personal Data

- b.) Protect against any anticipated threats or hazards to the security, confidentiality and integrity of Personal Data
- c.) Protect against any actual or suspected unauthorized processing, loss or unauthorized acquisition of any Personal Data
- d.) Ensure the proper and secure disposal of Personal Data
- e.) Must undertake requisite audits and submission to ensure and establish the same

#### **4.12 Customer Education and Awareness**

1. All participants should invest earnest efforts to drive education and awareness campaigns for QR payment adoption.
2. Issuers should explore to provide multi language (at least in Nepali and English) support for application as well as for customer education and awareness.
3. Issuers should provide customer a deeper understanding of security, Consumer education and awareness towards usage of secured Wi-Fi network or his/her own mobile network for digital transactions.
4. Awareness through intuitive UI, Print & Television advertisement, social media etc. emphasising the threat and consequences of divulging sensitive personal information like PIN/OTP/CVV etc. on phone or website or any other interface.

#### **4.13 QR Logo & Branding**

1. NRB, in consultation with concerned stakeholders, will prepare and implement the branding guidelines on usage & display of QR logo and visibility on the App.
2. The participants must be guided and compliant to the branding guidelines.
3. Acquirers must display the logo for acceptance and the app UI must educate and guide the customer on the App's support to scan the QR & support payment.

#### **4.14 Interoperability compliance**

Interoperability, as the primary objective for interoperable NepalQR based payments, will be based on the following levels of interoperability.

1. Inter-Network Interoperability
  - a. Based on the primary objective of "Interoperability", the network interoperability is what would be the ultimate objective. As of now, it is suggested for any PSOs [immediate member] participating in NepalQR to have payment inter-operability setup at technical level with proper settlement mechanism.
  - b. Inter-operability between networks will be further guided by the Inter-Network Settlement Guidelines issued by NRB.
2. The QR standard provides for all payment methods, therefore at the time of onboarding the Acquirer must provide the merchant with all possible payment modes registered by the Acquirer.
3. The Issuer may provide the customer to set any of his payment option or instrument as default, provided the customer has explicitly chosen (the default option should be pre-checked on 'No'). If the customer chooses to set the option as 'Yes', then the App provider is absolved from displaying all the payment options. The app should provision the customer to change or reset the default selection during the life cycle.
4. The Issuer should never mandate or force the customer to choose the payment option, choice of payment method or instrument is explicit choice of the customer

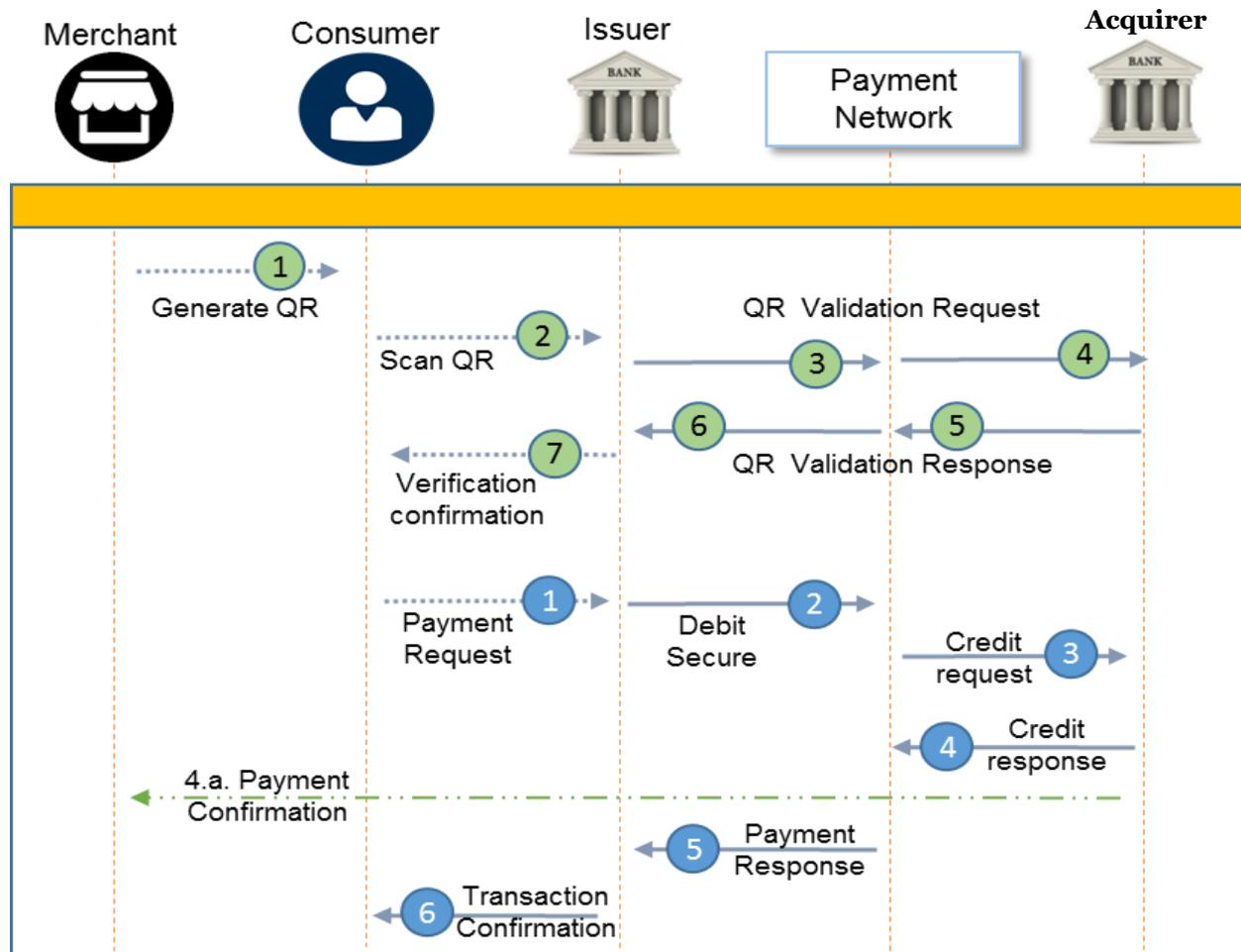
5. The transactions must be domestically routed, terminated and settled, if both Issuer and Acquirer are based and operated in Nepal.
6. Payment System Operators (PSOs) that use Proprietary QRs shall shift to NepalQR and no new Proprietary QRs shall be launched by any PSO for payment transaction after NRB defined date.

## **5. ANNEXURE I**

- Standardization of Quick Response (QR) Code- QR Specifications (Attached as a separate document below).

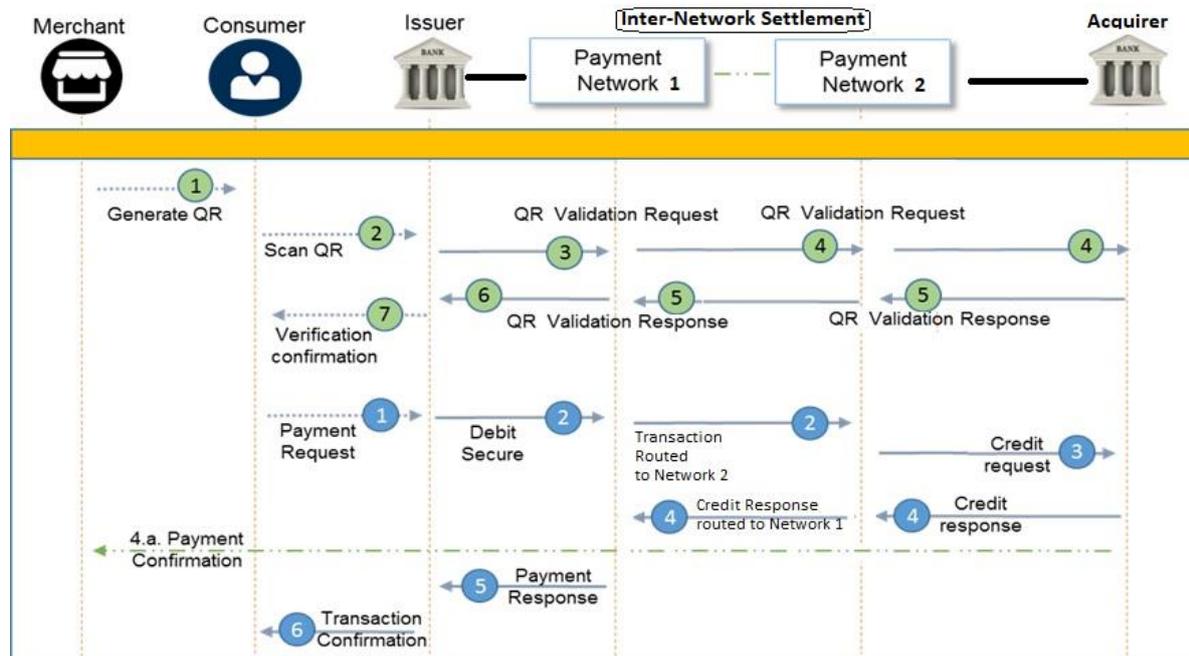
## 6. ANNEXURE II

Diagrammatic representation of QR Payment flow [within the same Scheme/Network]:

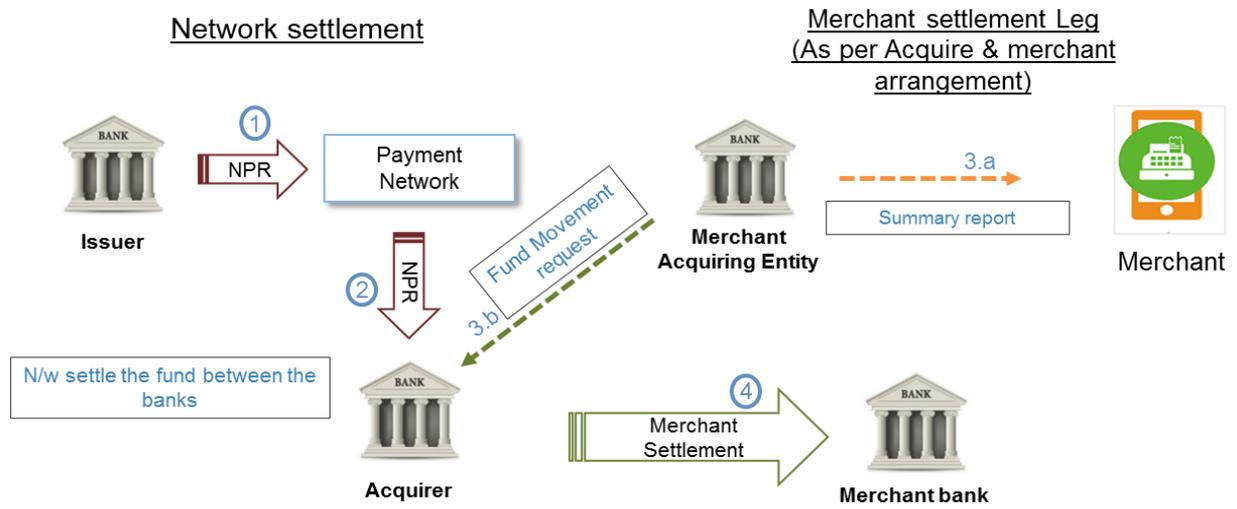


\*The above flow includes QR validation leg (non-financial) and Financial transaction

**Diagrammatic representation of QR Payment flow [Inter-Scheme/Network]:**



## Diagrammatic Representation of Payment Settlement



\*The payment network - Debits the issuers and credits the acquirers, generates reports for member banks reconciliation.

\*The Acquirer - Reconciles and credits the merchant account post service fee deductions.

**Taskforce on NepalQR Standardization Framework and Guidelines:**

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**Annexure: I**  
**Standardization of Quick Response**  
**(QR) Code –**  
**QR Specifications**  
**(Compliant to EMVCo. standard)**  
**Merchant Presented**

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**Version Information**

<b>Date</b>	<b>Version</b>	<b>Amendment/Change Description</b>
February 2021	1	Initial Publication

## 1. Overview

This document forms part of NepalQR Standardization Framework and Guidelines based on EMVCo. standards version 4.3.

## 2. NepalQR Specifications:

The QR code launched by any network/scheme operator has to adhere to NepalQR specifications.

Name	Tag Value	Encoding Format*	Len(2 digit BCD)	Usage	Description
<b>Payload Format Indicator</b>	00	N	02	Mandatory	Defines the version of the QR code release. Any increment to the version number would be jointly agreed between the participants (Cards & Network). The first version should be numbered "01".
<b>Point of initiation method</b>	01	N	02	Mandatory	In this two digit field first character indicates the method by which the data is presented by the merchant. The second character indicates if the data is static or dynamic. 1st character : 1 = QR 2 = BLE 3 = NFC 4-9:Reserved for future use  2nd character : 1=static, 2=dynamic 3-9:Reserved for future use  Example: "11" indicates QR static code "12" indicates QR dynamic code
<b>Merchant identifier as defined by network</b>	02-03	AN	Variable as defined by network	One of them is mandatory, anything more than one is optional	Tag to be followed by length and data as defined by Network 1 - Visa
	04-05				Tag to be followed by length and data as defined by Network 2 - Mastercard
	06-08				Tag to be followed by length and data as defined by Network 3 - NPCI
	09-10				Tag to be followed by length and data as defined by Network 4 - Discover

	11-12				Tag to be followed by length and data as defined by Network 5 - Amex
	13-14				Tag to be followed by length and data as defined by Network 6 - JCB
	15-16				Tag to be followed by length and data as defined by Network 6 – UnionPay
	17–25			Optional	Reserved by EMVCo. For additional Payment Networks
	26-51			Optional	To be allotted to existing/approved network/scheme operators considering present QR landscape and some tags will be reserved by Nepal Rastra Bank.
<b>Merchant Category Code</b>	52	N	04	Mandatory	As defined by ISO 8583:1993 for Card Acceptor Business Code
<b>Transaction Currency Code</b>	53	N	03	Mandatory	As defined by ISO 4217.
<b>Transaction Amount</b>	54	AN, limited to numeric and the "." symbol	Variable 13	Optional	This amount is expressed as how the value appears, amount “100.00” is defined as “100.00”, or amount “99.85” is defined as “99.85”, or amount “99.333” is defined as “99.333”, or amount “99.3456” is defined as “99.3456”
<b>Tip or convenience indicator</b>	55	N	02	Optional	01 : Indicates Consumer should be prompted to enter tip 02 : Indicates that merchant would mandatorily charge a flat convenience fee 03 : Indicates that merchant would charge a percentage convenience fee
<b>Value of convenience fee fixed</b>	56	AN, limited to numeric and the "." symbol	Variable 13	Conditional	The convenience fee of a fixed amount should be specified here. This amount is expressed as how the value appears, amount “100.00” is defined as “100.00”, or amount “99.85” is defined as “99.85”, or amount “99.333” is defined as “99.333” amount “99.3456” is defined as “99.3456” Note: 0 is not a valid value.

<b>Value of convenience fee percentage</b>	57	AN, limited to numerics and the "." symbol	Variable 05	Optional	The Convenience Fee Percentage is specified as whole integers between 000 (for 0%) to 100 (100%). E.g. "11.95" Note: 0 or 100 is not a valid value.		
<b>Country Code</b>	58	AN	02	Mandatory	As defined by ISO 3166.		
<b>Merchant Name</b>	59	ANS	Variable up to 23	Mandatory	Should always be the "doing business as" name for the merchant.		
<b>Merchant City</b>	60	AN	Variable up to 15	Mandatory	City of operations for the merchant		
<b>Postal Code</b>	61	AN	Variable up to 10	Mandatory	Zip code or Pin code or Postal code of merchant		
<b>Additional Data Field</b>	62 (constructed Tag)	AN	Variable 99 (up to the total length of the nested tags)	Conditional	Additional information beyond that mentioned above may be required in certain cases. This information may be either presented by the merchant or acquirer or the Consumer may be prompted for entry on the app. For consumer prompt, the value field of Tag would be 3 asterisks i.e. ***. The acquirer / merchant should provide only minimum information in order to avoid making the size of data onerous. The length of each tag is variable up to 26 characters and overall it is not to exceed the maximum of 99 characters for the total size of the Additional Data Field.		
					Tag Value	Item	Description
					01	Bill number	Invoice number or bill number
					02	Mobile number	To be used for top-up or bill payment
					03	Store Label	A distinctive number associated to a Store
04	Loyalty number	Typically a loyalty card number as provided by store or airline					

					05	Reference ID	Any value as defined by merchant or acquirer in order to identify the transaction
					06	Consumer ID	Typically a subscriber ID for subscription services or student enrolment number etc.
					07	Terminal ID	A distinctive number associated to a Terminal in the store. It will be mandatory value for all merchants on boarded for RuPay acceptance
					08	Purpose	Purpose of transaction like top-up for Mobile Top-Up use case- "Airtime", "Data", "International Package".
					09	Additional consumer data	
					10-49	Reserved for future use	
					50 - 99	Designated range of Identifiers that are dynamically allocable	
<b>CRC</b>	63	AN	04	Mandatory	CRC calculated to ISO/IEC 3309 compliant 16 bit CRC which includes all the preceding TLV objects till the Tag and length value of CRC i.e. A904. CRC would be the last TLV object.		

Table 1: NepalQR Specifications

### 3. QR data Objects & definitions:

#### 2.1 Merchant Account Information: Tag 02 to 51

This information identifies the merchant with the format and value being unique and specific to a payment system, also several values may be included in the QR Code

- 1) The specifications pre-defines tags for Global networks like Visa/ Master/ BharatQR/ JCB/ Discover/ UPI in tag 02 to 16
- 2) Tags 17 to 25 have been reserved by EMVCo for any other Payment Network in future use.
- 3) Tags 26-51 to be allotted to existing/approved network/scheme operators considering present QR landscape however some tags will be reserved by Nepal Rastra Bank for future purpose.

#### 2.2 Additional Merchant Information: Tag 52 to 62, Tag 64

This tag shall provide for generic merchant information such as Merchant category code, Merchant name, Country, Merchant info in any other language etc. (Refer *Table 1* above)

#### 2.3 Transaction value: Tag 53 to 57

This tag shall provide for additional information related to transaction such as Amount, Currency Tip and Convenience fee etc. (Refer *Table 1* above)

#### 2.4 Data Security: Tag 63

The EMVCo. Standard recommends Cyclic Redundancy Check (CRC), to detect any error on account of data corruption or tampering. It is the checksum calculated over all the data objects included in the QR code.

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