



# **STANDARD FOR INTEROPERABLE QR CODE PAYMENTS**



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NATIONAL BANK  
OF ETHIOPIA

## **Interoperable P2M Payments Using QR Code**



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## Glossary

Abbreviation	Description
CRC	Cyclic Redundancy Check
EMVCo	EMVCo is the global technical body that facilitates the worldwide interoperability and acceptance of secure payment transactions.
ET	Ethiopia (assumed based on context)
IPS	Immediate Payment Service (assumed based on context)
MAI	Merchant Account Information
MCC	Merchant Category Code
O2O	Offline-to-Online
P2M	Peer-to-Merchant
P2P	Peer-to-Peer
PACS.008	A type of financial message format
PAIN.013	Another type of financial message format
PFI	Payload Format Indicator
POI	Point of Initiation
PSO/PSP	Payment System Operator/Payment Service Provider
QR	Quick Response (in the context of QR Code)
RTP	Request to Pay
TTC	Transaction Type Code (assumed based on context)
UPI	Unified Payments Interface (commonly used in India)



## 1. Objective

The aim of introducing this QR Standard is to foster an environment that promotes wider access to and utilization of affordable acceptance methods for digital payments (specifically QR Codes), with the ultimate goal of digitizing merchant payments through standardized and unified QR codes and reduce the use of cash in the economy.

This standard is proposed keeping the following individual goals and principles in mind.

- Reduce capital as well as transactional costs for mass adoption of digital payments.
- Devise a unified QR standard to support multi-scheme model (both domestic and international).
- Promote wider adoption of QR code for different types of electronic payments (in-store, ecommerce, bill presentment & payments).
- Provide an enabling environment to offer discounts & loyalty rewards using the QR code.
- Enable static and dynamic QRs at acceptance points.
- Harmonize the practices of QR placement at merchant locations.
- Encourage small and medium merchants for digital payments.
- Enable domestic payment schemes to enable QR Code payments.
- Allow authorized merchant aggregators/non-bank acquirers to enter into merchant acquiring business for the overall growth of QR acceptance ecosystem.

## 2. Scope and Applicability

This standard is based on the EMVCo standard and applicable to all Banks, Micro Finance Institutions, Payment Instrument Issuers and PSO/PSPs in the country that are either offering or are desirous to offer a P2M QR Code as a mechanism for merchant payments to their customers.

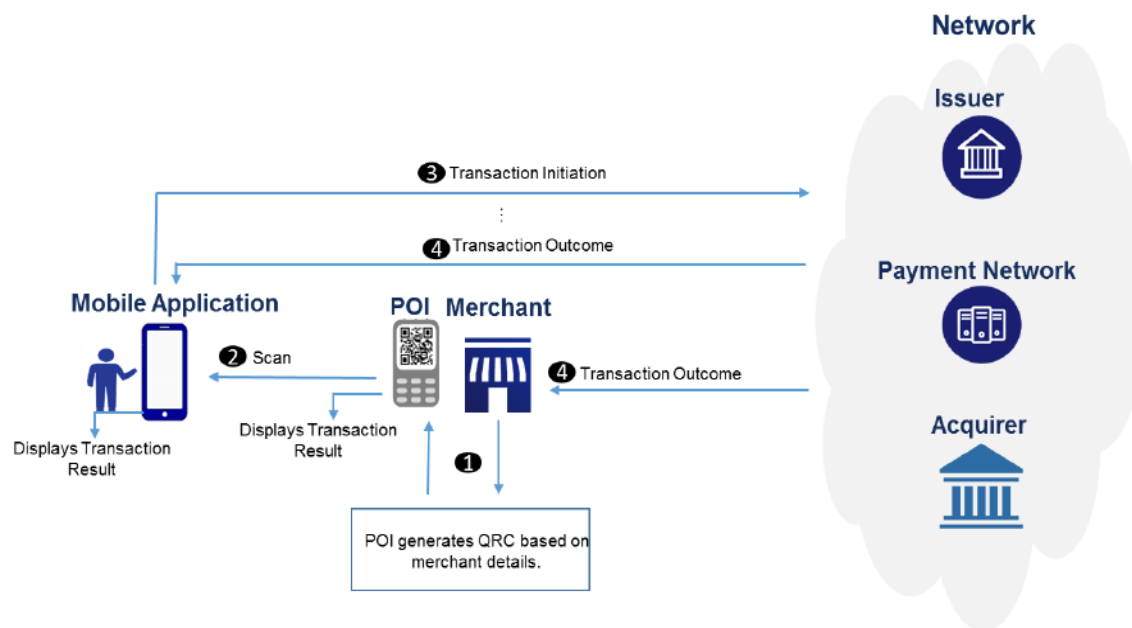
The EMVCo QR Code Specifications for Merchant Presented QR Code Payments<sup>1</sup> is used, this provides a standardized template for the generation of QR codes that will work consistently everywhere to deliver convenient and reliable card and account-based payments, however, the EMVCo Standard must be tailored to the Ethiopian context, that is the purpose of this document.

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<sup>1</sup> <https://www.emvco.com/specifications/emv-qr-code-specification-for-payment-systems-emv-grcps-merchant-presented-mode/>

### 3. QR Code Transaction Flows

QR codes have revolutionized the way commerce takes place. This streamlined process usually involves merchants generating QR codes with their details, consumers scanning these codes via a mobile app to initiate transactions, the app sending transaction requests to the network, and the network communicating the transaction outcome to both merchant and consumer. Below is a standard sequence of events to do a QR transaction.



- [1] Merchant generates and displays QR Code based on merchant details.
- [2] Consumer scans QR Code using a mobile application to initiate the transaction, with CDCVM if required.
- [3] Mobile application sends the transaction initiation request to the Network.
- [4] The Network processes the transaction and informs the Merchant and the Consumer of the transaction outcome.

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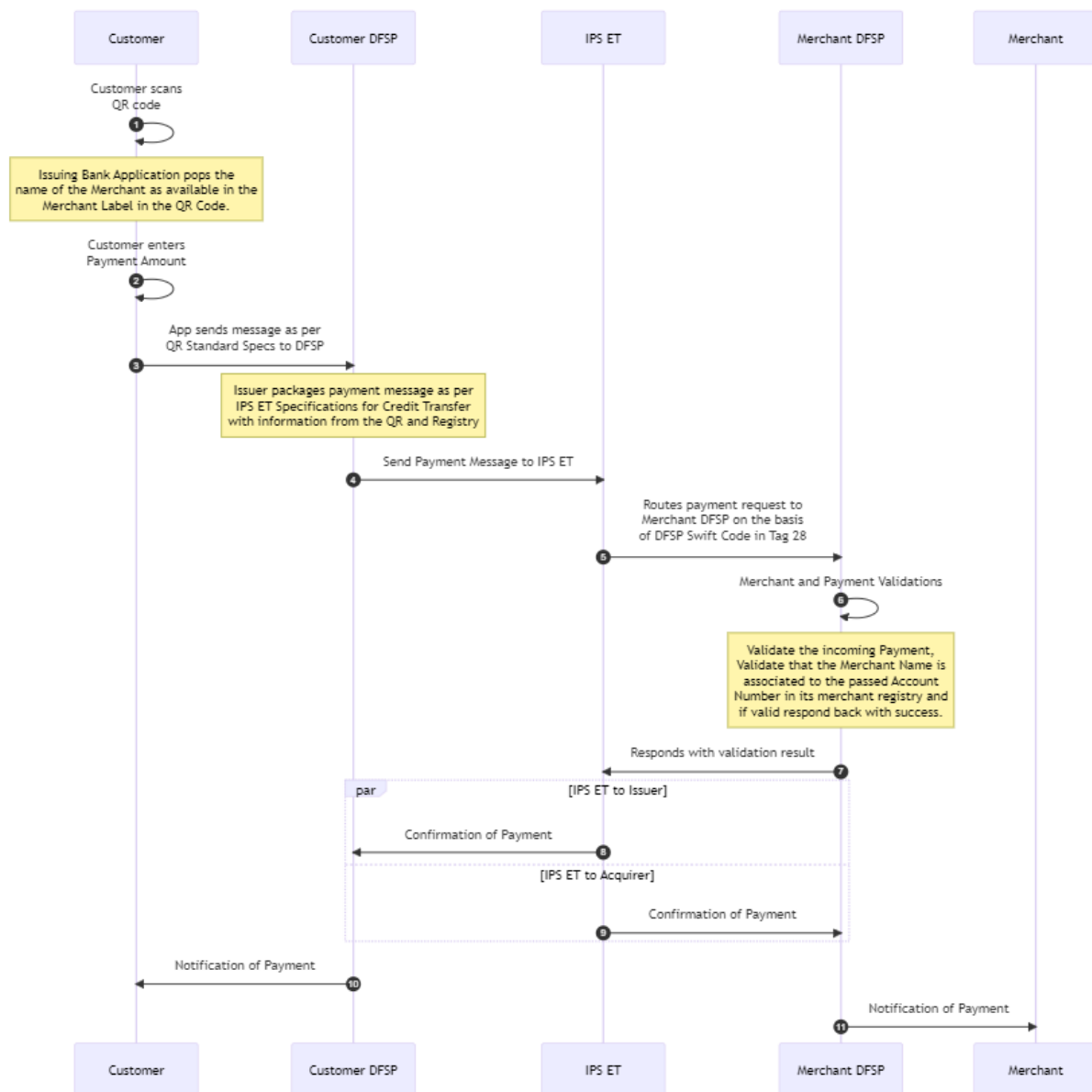
Within the domain of QR transactions, two fundamental types of QR codes play a pivotal role: static and dynamic. These variations add a layer of versatility to the transaction process, each catering to distinct needs. Understanding the contrast between static and dynamic QR codes is essential for optimizing payment experiences. As we move forward, let's delve into the specifics of these two QR code types and the unique advantages they offer in facilitating seamless transactions.

<sup>2</sup> Reference: EMV® QR Code Specification for Payment Systems Merchant-Presented Mode Overview to EMV® QR Code Payment, Page 13



## Interoperable P2M Payments Using QR Code

### Static QR Code Flow



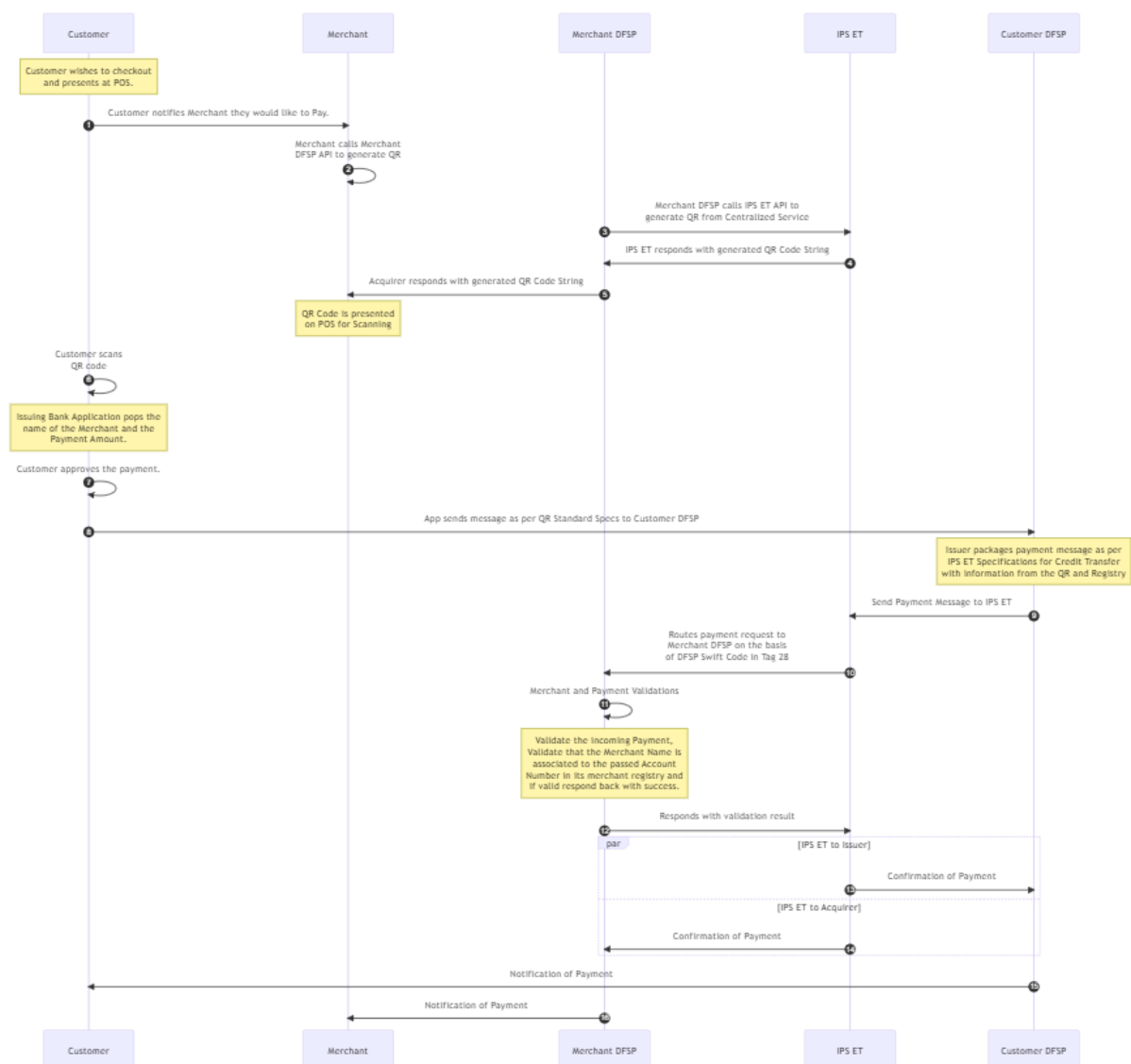
1. Customer scans the QR code. At this stage the Issuing Bank Application displays the name of the Merchant, retrieved from the Merchant Label in the QR Code.
2. Customer enters the Payment Amount.
3. Customer's app sends a payment initiation message to the Issuer (Customer DFSP). The Issuer packages the payment message according to IPS ET Specifications, using information from the QR and Registry.
4. The Issuer sends the Payment Message to IPS ET.
5. IPS ET routes the payment request to the Merchant DFSP (Acquirer) based on the DFSP Swift Code in Tag 28.



## Interoperable P2M Payments Using QR Code

6. Acquirer (Merchant DFSP) performs Merchant and Payment Validations: It validates the incoming Payment. Validates that the Merchant Name is associated with the passed Account Number in its merchant registry.
7. The Acquirer responds with success if validations are successful.
8. IPS ET confirms the payment to the Issuer and the Acquirer.
9. Acquirer (Merchant DFSP) receives the confirmation of payment from IPS ET.
10. Issuer notifies the Customer about the successful payment.
11. Acquirer notifies the Merchant about the successful payment.

## Dynamic QR Flow



1. The customer presents at the Point of Sale (POS) for checkout, the customer notifies the Merchant about their intention to pay.



#### Interoperable P2M Payments Using QR Code

2. The merchant calls the Merchant DFSP API to generate a QR code by providing it all relevant information necessary to generate the QR Code.
3. Merchant DFSP (Acquirer) calls the IPS ET API to generate a QR code through the Centralized Service.
4. IPS ET responds to the Acquirer with the generated QR code string.
5. Acquirer (Merchant DFSP) responds to the Merchant with the generated QR code string and the QR code is displayed on the POS for scanning.
6. Customer scans the QR code. At this stage the Issuing Bank Application displays the name of the Merchant, retrieved from the Merchant Label in the QR Code.
7. Customer enters the Payment Amount.
8. Customer's app sends a payment initiation message to the Issuer (Customer DFSP). The Issuer packages the payment message according to IPS ET Specifications, using information from the QR and Registry.
9. The Issuer sends the Payment Message to IPS ET.
10. IPS ET routes the payment request to the Merchant DFSP (Acquirer) based on the DFSP Swift Code in Tag 28.
11. Acquirer (Merchant DFSP) performs Merchant and Payment Validations: It validates the incoming Payment. Validates that the Merchant Name is associated with the passed Account Number in its merchant registry.
12. The Acquirer responds with success if validations are successful.
13. IPS ET confirms the payment to the Issuer and the Acquirer.
14. Acquirer (Merchant DFSP) receives the confirmation of payment from IPS ET.
15. Issuer notifies the Customer about the successful payment.
16. Acquirer notifies the Merchant about the successful payment.





## 4. QR Specification Standard

The following outlines the guidelines for acquirers to create QR Codes for merchants and for issuers to develop their applications accordingly. **According to EMVCo**, Tag IDs (02-25) are exclusively allocated for international Payment Schemes, while tags 26 to 51 can be utilized by domestic schemes. Therefore, Merchant Account Information for our standard inherited from EMVCo but adapted to the Ethiopian Context is as follows.

ID	Scheme Allocation
02 – 03	Reserved for Visa
04 – 05	Reserved for Mastercard
06 – 08	Reserved for EMVCo
09 – 10	Reserved for Discover
11 – 12	Reserved for Amex
13 – 14	Reserved for JCB
15 – 16	Reserved for UnionPay
17 – 25	Reserved for EMVCo
26 – 51	Reserved for additional payment networks or domestic schemes. <ul style="list-style-type: none"> <li>• 26 – 27 reserved for future use.</li> <li>• 28 – 30 reserved for <b>IPS ET</b>.</li> <li>• 31 – 51 reserved for future use.</li> </ul>

Table 1: Merchant Account Information Definition as per EMVCo

### Standard Template for QR Codes with Multiple Schemes Embedded

- The scheme identifier (first two digits of the MAI) will be issued by EthSwitch only to those authorized PSO/PSPs which are desirous to offer QR Codes for merchant payments in the country.
- The proposed template of Standard QR is placed below covering EMVCo Tag IDs, adjusting multiple payment schemes (international and domestic), newly reserved Tag ID for domestic schemes as well as reserved templates for future use.
- Participants can decide to include additional objects from EMVCo as per their design considerations and requirements. Reference can be made to the EMVCo QR Code Specifications for Merchant Presented QR Code Payments<sup>3</sup> for anything not explicitly defined in this document.

<sup>3</sup> <https://www.emvco.com/specifications/emv-qr-code-specification-for-payment-systems-emv-grcps-merchant-presented-mode/>



## Interoperable P2M Payments Using QR Code

**EthSwitch QR Code Template (Table 2)**

EMVCo Tag ID	00	01	02	04	06	26	28	52	53
Desc.	PFI	POI	MAI1 Visa	MAI2 Mastercard	MAI3 UPI	MAI4 Domestic Scheme 1	MAI5 Domestic Scheme 2	MCC	Currency

EMVCo Tag ID	54	55, 56 & 57	58	59	60	62*	63	64	80
Desc.	Amount	Convenience Fee	Country Code	Merchant Name	Merchant City	Additional Data Field	CRC	Alternate Language	Transaction Context

62\* Additional Data Field is further broken down and explained below

EMVCo Tag ID	81	82	83	84	85	86	87	88	89-99
Desc.	Discounts & Loyalty Programs	Offline to Online	e-comm.	Scheme Specific			Acquirer Specific		CRC

**Additional Data Field Template (ID 62) (Table 3)**

EMVCo Tag ID	62								
Description	01	02	03	04	05	06	07	08	09
	Bill Number	Mobile Number	Store Label	Loyalty Number	Reference Label	Customer Label	Terminal Number	Purpose	Addl. Customer Data

EMVCo Tag ID	62						
Description	10	11	50	51	52-54	55-56	57-99
	Merchant Tax. ID	Merchant Channel	Due Date	Amount after Due Date	Scheme Specific	Acquirer Specific	Reserved for Future Use

## Details of Data Objects within QR Standard

The details of all tags identified in the standard in the previous section are defined in Table 4 below:

EMVCo Tag ID	Name	Format	Length	M/O/C	Description	IPS Specific Notes
00	Payload Format Indicator	N	02	M	Default value is 01 as per EMVCo.	
01	Point of Initiation Method	N	02	O	11- for Static QR 12- for Dynamic QR	Mandatory in RAAST P2M QR
Refer Table 1	Merchant Account Information	ANS	var. up to 40 each	M	At least one MAI should be present	MAI 28 will contain following in Sub-tags: <ul style="list-style-type: none"> <li>Sub Tag 00: GUID - A [UUID] without the</li> </ul>



# Interoperable P2M Payments Using QR Code

						<p>hyphen (-) separators. For example, "581b314e257f41bfbb dc6384daa31d16"</p> <ul style="list-style-type: none"> <li>Sub Tag 01: Creditor Institution BIC which is MSP (8 or 11)</li> <li>Sub Tag 02: Merchant Account (24)</li> </ul> <p>Payer Bank will scan QR and use Creditor institution BIC and Merchant IBAN to create payment message (pacs.008).</p>
52	Merchant Category Code	N	04	M	The category under which merchant falls (as per ISO 18245)	
53	Transaction Currency	N	03	M	Currency Code of the transaction (as per ISO 4217)	'230' for ETB
54	Transaction Amount	ANS	var. up to 13 each	O	Amount of the transaction – either built into the QR (dynamic) or prompted from the customer (static)	Payer Bank's application should have the logic to prompt for amount if amount is not present.
55	Tip or Convenience fee Indicator	N	02	O	If required.	<p>TIP Indicator will only be applicable in specific merchant categories that should be allowed in IPS ET P2M Scheme Rules.</p> <p>Merchant service providers will ensure this tag is only included if the category of Merchant is enabled for TIP. Merchant services provider (MSP) would determine if a particular merchant category is to be enabled for collection of TIPs.</p> <p>The following values as per EMVCo standard will be used.</p> <ul style="list-style-type: none"> <li>01 – Prompt customer for Adding Tip in payment.</li> </ul>



# Interoperable P2M Payments Using QR Code

						<ul style="list-style-type: none"> <li>02 – Fixed Tip Amount included in QR (Tag 56)</li> <li>03 – Percentage based TIP as per %age defined in Tag 57.</li> </ul> <p>e.g.            01 = 1000 + [xxx]            02 = 1000 + [100] = 1100            03 = 1000 + 5% = 1050</p> <p>Refer: Section 3.4 of EMV-Merchant-QR-Guidance-and-Examples-1.0 document</p>
56	Value of Convenience Fee (fixed)	ANS	var. up to 13 each	C	Any of these two is required if ID 55 is populated.	
57	Value of Convenience Fee (%)	ANS	var. up to 05 each	C		
58	Country Code	ANS	02	M	Country code of the merchant. (Alpha-2 code - ISO 3166)	“ET” for Ethiopia
59	Merchant Name	ANS	var. up to 25 each	M	“Doing business as” name of the merchant as per acquirer’s record.	
60	Merchant City	ANS	var. up to 15 each	M	City of physical presence of Merchant. If QR is generated through an online portal, then the scheme shall decide how this field should be populated.	<p>For online merchants, the CITY should be registered head office location of the Merchant.</p> <p>List of Cities to be shared with Participants which will be acceptable.</p>
62	Additional Data Field Template	S	var. up to 99 each	O	This includes information that may be explicitly defined in QR or may be prompted to the customer. This is an optional field in EMVCo covering many sub- fields	



# Interoperable P2M Payments Using QR Code

					described in Table 5 below.	
63	CRC	ANS	04	M	Cyclic Redundancy Check (as per EMVCo QRCPS)	
64	Merchant Information – Language Template	S	var. up to 99 each	O	This allows the merchant's name and city to be kept in an alternate / local language. The scheme shall decide how to populate this field in accordance with EMV QRCPS.	Participant may opt to use this to display Merchant Name in Local Language(s) If Present, Payer application will show the Merchant Name in Alternate language as well. Refer to EMVCo Document Section 3.6 for example.
80	Context of Transaction	ANS	var. up to 50 each	O	Context/Particulars of the Tx; may be prompted from the customer or explicitly defined in the QR.	This field can be used by Merchant to convey Context of transaction. For example, if School Fee is being paid then Context can be a free text "School Fee for August 2022."  Merchant Service Provider / Payee who generates QR must include either this field OR Field 62/08 (Purpose of Transaction) in the QR.  Payer Institution will see if Tag 80 or Tag 62/08 is present then display this on screen to customer.
81	Discounts & Loyalty Programs	ANS	var. up to 30 each	O	This field is reserved for Discounts & Loyalty programs by the scheme or the acquirer / issuer.	Isn't needed right now but good to have for future use.
82	Offline to Online	ANS	var. up to 50 each	O	Reserved for Offline to Online Payments. O2O is the experience where the customer scans a QR code at the merchant location	Isn't needed right now but good to have for future use.



# Interoperable P2M Payments Using QR Code

					which contains a URL and subsequently routes the customer to the merchants. website/portal.	
83	E-Commerce	ANS	var. up to 40 each	O	Reserved for e-Commerce related transactions.	Isn't needed right now but good to have for future use.
84-86	Scheme Specific	ANS	var. up to 40 each	O	To be used by the domestic scheme for its participants.	<p>Tag 84 will contain End-End ID of 35 characters in case of Dynamic QR generated by Payee/Merchant service Provider, with Request to Pay (RTP).</p> <p>Acquirer will generate Dynamic QR with Tag84 containing same E2E ID which is sent in RTP - this is special RTP which will not go to Payer FI - It will be like RTP now.</p> <p>The Field will be scanned by Payer and passed on in the PACS.008 message so it can be matched with Request to Pay (PAIN.013) message.</p> <p>Tag 85 will contain valid value of TTC</p>
87-88	Acquirer Specific	ANS	var. up to 40 each	O	To be used by the acquirer / issuer for onward usage of its own customers.	
89-99	Reserved for Future Use	ANS	var. up to 40 each	O	Reserved for future use.	

## Key Assumptions:

- IDs from 80-99 are unreserved under EMVCo, a few of which have been customized under this standard to be used within the country.
- The acquirers, while generating QR Code, will ensure that the overall length of the payload should not exceed 512 characters as per EMVCo. specification.



#### Interoperable P2M Payments Using QR Code

- Whereas ID 82 has been reserved for Offline-to-Online transactions (O2O) and already described in table 2 above; extra care should be taken in terms of its security considerations. It shall be the responsibility of the acquirer to ensure that the URL being mapped in this field pertains to the legitimate and secure website/portal of the merchant. The acquirer shall also undertake necessary measures on ongoing basis related to information security of the user for this purpose, including but not limited to; periodic checks of the URL for authenticity and ensuring that no sensitive information (any identity disclosing information, any password, OTP, or any other financial information) is asked from user on that URL at any given point of time. Since this is an optional field, the issuers may develop their apps/portals to prohibit reading / processing of this field for off-us transactions OR allow it only for on-us transactions (where the QR provider and app/portal provider is the same entity).

(Below) Table 5: Details of Data Objects for Additional Data Field Template under ID 62

EMVCo Tag ID	Name	Format	Length	M/O/C	Description	IPS Specific Notes
01	Bill Number	ANS	var. up to 25	O	Bill/Invoice/Voucher number. E.g., Utility bills, school fee vouchers, challan vouchers etc.	<p>Will be present as Mandatory for specific Merchant Category codes and Transaction Codes where Payment is made against specific Order.</p> <ul style="list-style-type: none"> <li>Utility Bills (consumer number)</li> <li>P2G payments (Invoice or Bill Number as issued by Govt. Agency Biller)</li> <li>Any Other bills (Bill Number/Voucher number)</li> </ul> <p><b>Usage in case of Customer initiated Payment.</b> The QR will have bill specific Information and Payer will scan and pass this information in PACS.008 to Payee for them to validate before accepting Payment.</p>
02	Mobile Number	ANS	var. up to 25	O	Mobile number of the merchant.	Can be used for Mobile top-up. Payee will put "****" if they need Mobile Number of



# Interoperable P2M Payments Using QR Code

						<p>transaction processing. (e.g., Mobile top-up)</p> <p>Payer will send Mobile Number in Payment message in (PACS.008) in appropriate field as per Message Specifications.</p>
03	Store Label	ANS	var. up to 25	O	The branch name of the merchant.	For Proximity Payments, this field will contain the Branch Name of Merchant
04	Loyalty Number	ANS	var. up to 25	O	The identifier assigned to a customer by a merchant/brand/business for loyalty rewards.	<p>If the Payee has a Loyalty program and wants customers to input their Loyalty Card Number during payment, then the QR will contain this field with “****”</p> <p>Management of Loyalty program(s) will be the responsibility of MSP/Payee institution.</p> <p>Payer application will prompt customer to Enter their Loyalty Card Number while making payments so they can earn loyalty points.</p> <p>See EMVCo document Section 3.5.1 for example.</p>
05	Reference Label	ANS	var. up to 25	O	A label or reference number that needs to be attached to a QRC or Transaction.	<p>For merchants using electronic systems for managing Sales, this field will be mandatory and will contain Merchant provided additional information which they need to reconcile Payment against and order.</p> <p>See EMVCo Document Section 3.5 for examples</p>
06	Customer Label	ANS	var. up to 25	O	The consumer number issued by the merchant to uniquely identify a customer. For eg subscriber id, student enrollment no. etc.	This field will be present in specific Category codes where Customer is enrolled by Merchant/Biller.





# Interoperable P2M Payments Using QR Code

07	Terminal Label	ANS	var. up to 25	O	The counter ID or Till ID where the QRC is placed.	For Proximity Payments where Person is paying a merchant in person, the QR code will contain Terminal ID information.
08	Purpose of Transaction	ANS	var. up to 25	O	The purpose of transaction. May be prompted from the customer or explicitly defined in the QR.	Purpose will be List of values that will be provided by EthSwitch, and it is Mandatory that Tag 62/08 will always be present – Tag 80 may or may not be present. Example of Purpose can be “Fee Payment”
09	Additional Customer Data Request	ANS	var. up to 25	O	This includes additional data request (Address, Mobile number, email address) from the consumer which may be prompted from the user.	<p>The field will contain the characters:</p> <ul style="list-style-type: none"> <li>A = Address Request</li> <li>M = Mobile Number</li> <li>E = Email</li> </ul> <p>The QR can contain either all characters or only specific characters.</p> <p>The payer app will prompt customers to enter the information or show the default information already registered with payer to be shared with MSP/Payee against this request. Payer FI will send the information in Payment Message (PACS.008) in appropriate field as per specifications.</p>
10	Merchant Tax ID	ANS	var. up to 25	O	The identification number assigned to the merchant by federal or provincial tax authority.	Will be kept optional. Merchants who are registered with the tax authority so that they can put their Tax Identification Number in this tag.
11	Merchant Channel	ANS	03	O	The characteristics of the channel used for a particular transaction. Refer	



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					to EMV QRCPS for details	
12 – 49	Reserved for Future Usage for EMVCo	S	-	O		
50	Due Date	N	08	O	The due date of payment in the format DDMMYYYY. This may be used for Bill/Voucher payments.	For Payments which have a Due Date, this will be present.  If the QR is not generated dynamically, the Payer must ensure that Amount prompted to customer is accurate based on Due Date. The Payee will also validate the same when receiving PACS.008  In case of Dynamic QR generated as Request to Pay, the QR code should contain appropriate Transaction Amount payable for the bill.
51	Amount After Due Date	N	var. up to 13	C	The amount to be paid after Due date has passed. This shall be present if “Due Date” Field is populated.	Present if Due Date is present in Tag 50.
52 – 54	Scheme Specific	S	var. up to 25	O	To be used by the domestic scheme for its participants.	
55 – 56	Acquirer Specific	S	var. up to 25	O	To be used by the acquirer / issuer for usage of its own customers.	
57 – 99	Reserve for Future Usage EthSwitch/NBE	S	var. up to 25	O		



## 5. QR Code Interoperability for In-Store Purchases

One of the objectives of this standard is to harmonize the practices of QR Code placement at merchant locations. While devising a country-wide standard for QR codes, the possible scenarios in terms of QR generation and placement may be kept in mind at the time of merchant onboarding. The idea is to introduce interoperability of QR codes at the merchant level using multi-scheme QR template as described earlier. The following table exhibits these scenarios as well as the desired action of the acquirer at the time of merchant onboarding:

QR Placement Scenario	Description	Q1. Will the acquirer place a new QR at merchant location?	Will the existing QR be replaced by a new and backward compatible QR?	# of QRs at Merchant Location
Scenario 1	A merchant is being onboarded by the acquirer for the first time.	Yes	N/A	One QR
Scenario 2	A merchant, already onboarded by an acquirer on an international scheme, is being onboarded by the same acquirer on another international scheme.	Yes	Yes, the new QR code will be interoperable for both schemes.	One QR
Scenario 3	A merchant, already onboarded by an acquirer on international scheme(s) is being onboarded by the same acquirer on a domestic scheme.	Yes	Yes, the new QR will be interoperable for all previous schemes as well as new one.	One QR
Scenario 4	A merchant onboarded by an acquirer on an international or domestic scheme is being onboarded by a different acquirer on an international or	Yes	There will be two QRs at merchant location in this scenario.	Two QRs



	domestic (or both or multiple of them)			
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## 6. Roles and Responsibilities

The broad roles and responsibilities of respective participants are as follows:

### Acquirers

1. For all the acquirers currently working or intending to undergo QR offerings, it will be mandatory to be on-boarded with IPS ET as a domestic payment scheme, in due course as per the plan shared by the EthSwitch team. However, they may also work with international payment schemes and other domestic schemes as per their choice and feasibility.
2. The acquirers will start to generate QR codes for newly onboarded merchants and replace existing QR Codes in compliance with this standard.
3. For the situation depicted in scenario 2 and 3 in section above, where an acquirer has onboarded or is onboarding the same merchant to an additional scheme; the acquirer will replace the QRC(s) at merchant locations with a unified and interoperable QR code using multi-scheme template under this standard.
4. The QR acquirers are encouraged to generate dynamic QRs through online portals /apps (for e- Commerce) or digital display screens (for in-store purchases).
5. All acquirers shall offer QR codes to the merchants under IPS ET, in addition to other domestic and international schemes. The acquirers working in the closed-loop model shall cease to issue closed-loop QR and only scheme-based (open-loop) QR codes will be operational.
6. The acquirers may use the data objects, reserved as Acquirer Specific, for their own customers i.e., where the acquirer and issuer are the same entity.

### Issuers

1. The issuers of QRCs shall develop their apps and portals to be aligned with the specifications mentioned in this document, enabled to read all QRCs that have been generated in compliance to this standard, not later than Date to be shared.
2. For the merchant who has been onboarded on multiple schemes by an acquirer, the issuer's app will allow the customer to select between the scheme of the choice of the customer; to the extent that the scheme is recognized by the issuer. However, IPS ET will be the default scheme for all acquirers and issuers for processing payments through QR Codes.
3. The issuers shall enable their apps / portals to read the QR as a picture (.jpg, .png, etc.) from storage media, besides enabling the QR to be scanned through the camera.



## IPS ET QR Scheme

1. The PSO/PSPs and other regulated entities, desirous of offering QRs as a payment mechanism under their scheme(s), may approach EthSwitch to get their Merchant Account Information ID (MAI ID- first two digits) to be allocated. For this, the concerned PSO/PSP will have to submit their project plan along with respective scheme rules including fraud mitigation & management, merchant services management, consumer protection & dispute resolution mechanism. Once the MAI ID is issued to the PSO/PSP, it may go ahead to onboard acquirers and issuers on its QR scheme.
2. Only the entities licensed by NBE as PSPs are entitled to allow QR Code offerings through a scheme to their participants (acquirers and issuers). This is referred to as domestic QR scheme earlier in this document.
3. Applications for allocation of MAI (first two digits) along with the items mentioned above may be addressed to EthSwitch or NBE (yet to be decided).
4. IPS scheme participants shall follow the format of MAI and shall share with the participants. NBE will issue Bank Identification Codes (BICs) to the acquirers and issuers of the scheme.
5. The scheme operator shall also devise the items to be used under Scheme Specific Data objects for scheme's acquirers and issuers (if needed).
6. EthSwitch shall establish, maintain, and operate the scheme through well-defined system/business rules, fraud management, consumer protection and dispute resolution mechanisms etc. and will issue further details under System Rules



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Interoperable P2M Payments Using QR Code

## Annexure A – Sample QR

A sample QR Code is placed below which shows a single QR for a merchant which has been onboarded by a single acquirer on multiple schemes.

### Data Mapping for QR

RED: TAG ID

BLUE: TAG LENGTH

GREEN: TAG VALUE



### Deciphered Text of QR

000201010212021640001234567890120416534512345678901215166345123456789012287600325  
81b314e257f41bfbbdc6384daa31d160108CBETETAA0216000017123456789052045999530358658  
02ET5924TewodrosSpices&Grains6010ADDISABABA62890117234567854321234560211032400000  
000324Tewodros Spices & Grains05131238765432123071245678909876563045376

### QR Payload Transposed for Readability

Payload Format Indicator:	000201
Point of Initiation:	010212
MAI1 Visa:	02164000123456789012
MAI2 Mastercard:	04165345123456789012
MAI3 Unionpay:	15166345123456789012
MAI4 IPS ET:	2876 0032581b314e257f41bfbbdc6384daa31d16 0108CBETETAA 02160000171234567890
Merchant Category Code:	52045999
Currency:	5303586
Country Code:	5802ET
Merchant Name:	5924TewodrosSpices&Grains
Merchant City:	6007ADDISABABA
Addl. Data Template:	6289 011723456785432123456 0211032400000000 0324Tewodros Spices & Grains 05131238765432123 0712456789098765
CRC:	63045376



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Interoperable P2M Payments Using QR Code

## Annexure B – Existing QR Codes in Ethiopia

Several banks and non-banks today issue QR Codes, for example below two QR Codes are listed from



TeleBirr.

Deciphered text = 1398597851655077890

Deciphered text = 1633760219602558978

In both of the above examples, the QR codes takes the Merchant Till Number as the destination but it is constrained such that only TeleBirr App can scan TeleBirr QR Codes and payments can only be made within TeleBirr rather than interoperably from any bank account. Similarly this is not rich enough to pass transaction context.

- **Limited Acceptance:** Since it's a closed system, the QR code can only be used within a specific ecosystem or with specific merchants. This limits the user's flexibility to use it across different platforms or stores.
- **Interoperability Issues:** Closed-loop systems often face challenges in integrating with other payment systems or platforms. This can be a barrier to expanding the user base or collaborating with other service providers.
- **User Inconvenience:** Users might need to maintain multiple QR code apps or accounts if they transact with different ecosystems, leading to inconvenience and app fatigue.
- **Limited Reach for Merchants:** Merchants are restricted to the customers within that specific ecosystem, limiting their potential customer base.



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Also, these QR codes are not EMVCo Compliant. This means,

- **Lack of Interoperability:** EMVCo standards are designed to ensure that QR code payment systems can work seamlessly across different banks, merchants, and payment systems. Non-compliance means that the QR code system might not be compatible with other systems that adhere to EMVCo standards.
- **Security Concerns:** EMVCo standards incorporate a range of security features to protect against fraud. Non-compliant systems might not have these security features, making them more vulnerable to fraud and cyberattacks.
- **Fragmented Market:** Without a standardized approach, the market can become fragmented with multiple closed-loop systems operating independently. This fragmentation can hinder the overall growth and development of the digital payment ecosystem in the country.