



ISO 8583 SIMPLIFIED

ISO 8583 Presentation

RANJITH GOWDA NAGARAJA
rnagaraja@moi.gov.qa

Table of Contents

1	Introduction	2
2	ISO8583 Message.....	2
2.1	Message Structure	2
2.2	Message Format.....	2
3	Message type indicator (MTI).....	2
3.1	Versions of ISO8583	2
3.2	Message Class	2
3.3	Message Functions.....	3
3.4	Message Origin	3
4	MTI Overview	3
5	Bit Map.....	4
6	Data Elements.....	4
6.1	Some of the Data Element.....	4
7	Raw Data/Raw Message	5
7.1	Message consisting of primary bit map	5
7.2	Message consisting of secondary bit map	5
7.3	Legends	5
7.4	Encodings	5
8	Payment Eco System	6
9	Common Definition.....	7
9.1	Issuer	7
9.2	Acquirer.....	7
9.3	Certification Authority, Payment Scheme, Switching Interface	7
9.4	Cardholder	7
9.5	Issuer BIN's.....	7
10	SMS Transaction.....	8
11	DMS Transaction	8
12	Reference	8

Table of Figures

Figure 1 MTI Example	3
Figure 2 Payment Ecosystem example1	6
Figure 3 Payment Ecosystem example 2	6

1 Introduction

What is ISO 8583?

ISO 8583 is an international standard for financial transaction card originated interchange messaging. It is the [International Organization for Standardization](#) standard for systems that exchange electronic transactions initiated by cardholders using [payment cards](#).

2 ISO8583 Message

2.1 Message Structure

Header

Application Data

Trailer

Note: Header - it is very common to include a header with the length of the message when sending ISO8583 over a network. The header is usually 2 bytes long and is a binary unsigned integer with the length of the full message

Application data – Contains information of the Data elements

2.2 Message Format

Message type indicator (MTI)

Bit map (One or Two, indicating which data elements are present)

Data Elements (Actual information of the field for the message)

3 Message type indicator (MTI)

MTI - The message type indicator is a **four-digit** numeric field which indicates the overall function of the message.

- First Digit – ISO8583 Version
- Second Digit - The Message Class
- Third Digit – The Message Function
- Fourth Digit – The Message Origin

3.1 Versions of ISO8583

- 0XXX - ISO8583:1987
- 1XXX - ISO8583:1993
- 2XXX - ISO8583:2003
- 3XXX to 7XXX - Reserved
- 8XXX - National Use
- 9XXX - Private Use

3.2 Message Class

- x0xx - Reserved by ISO
- x1xx - Authorization Message
- x2xx - Financial Message
- x3xx - File Actions Message
- x4xx - Reversal Message
- x5xx - Reconciliation Message
- x6xx - Administrative Message
- x7xx - Fee Collection Message
- x8xx - Network Management Message

- x9xx - Reserved by ISO

3.3 Message Functions

- xx0x - Request
- xx1x - Request Response
- xx2x - Advice
- xx3x - Advice Response
- xx4x - Notification
- xx5x - Notification Acknowledgement
- xx6x - Instruction
- xx7x - Instruction Acknowledgement
- xx8x - Reserved for ISO use
- xx9x - Reserved for ISO use

3.4 Message Origin

- xxx0 - Acquirer
- xxx1 - Acquirer Repeat
- xxx2 - Issuer
- xxx3 - Issuer Repeat
- xxx4 - Other
- xxx5 - Other Repeat
- xxx6 - Reserved by ISO
- xxx7 - Reserved by ISO
- xxx8 - Reserved by ISO
- xxx9 - Reserved by ISO

4 MTI Overview



Figure 1 MTI Example

MTI	Meaning	Usage
0100	Authorization Request	Authorization Request
0110	Request Response	Request response to a point-of-sale terminal for authorization for a cardholder purchase
0120	Authorization Advice	When the Point of Sale device breaks down and you have to sign a voucher
0130	Issuer Response to Authorization Advice	Confirmation of receipt of authorization advice
0200	Acquirer Financial Request	Request for funds, typically from an ATM or pinned point-of-sale device
0210	Issuer Response to Financial Request	Issuer response to request for funds
0400	Acquirer Reversal Request	Reverses a transaction
0420	Acquirer Reversal Advice	Advises that a reversal has taken place
0430	Issuer Reversal Response	Confirmation of receipt of reversal advice
0800	Network Management Request	Hypercom terminals initialize request. Echo test, logon, logoff etc.
0810	Network Management Response	Hypercom terminals initialize response. Echo test, logon, logoff etc.

Table 1 MTI definition examples

5 Bit Map

- Indexing Technique
- To indicate which Data Elements are Present.
- '1' represents the presence
- '0' represents the absence

Note: The individual bits indicate which of the later fields are present in this particular message instance. The primary bitmap specifies whether fields 1 - 64 are present. If a secondary bitmap is also included, it specifies whether fields 65 - 128 exist.

6 Data Elements

Carry Information of Transactions.

Each Data Element specifies data format and size

Data Element Representation:

- Data type of the content
- Length of the Content

Note: Data Elements are fields carrying the information of the transaction itself. There are up to 128 Data Elements in the original ISO 8583 (1987) standard

6.1 Some of the Data Element

Index	Name	Type
DE 2	Primary account number (PAN)	n..19
DE 3	Processing code	n 6
DE 4	Amount, transaction	n 12
DE 22	Point of service entry mode	n 3
DE 35	Track 2 data	z.. 37

8 Payment Eco System

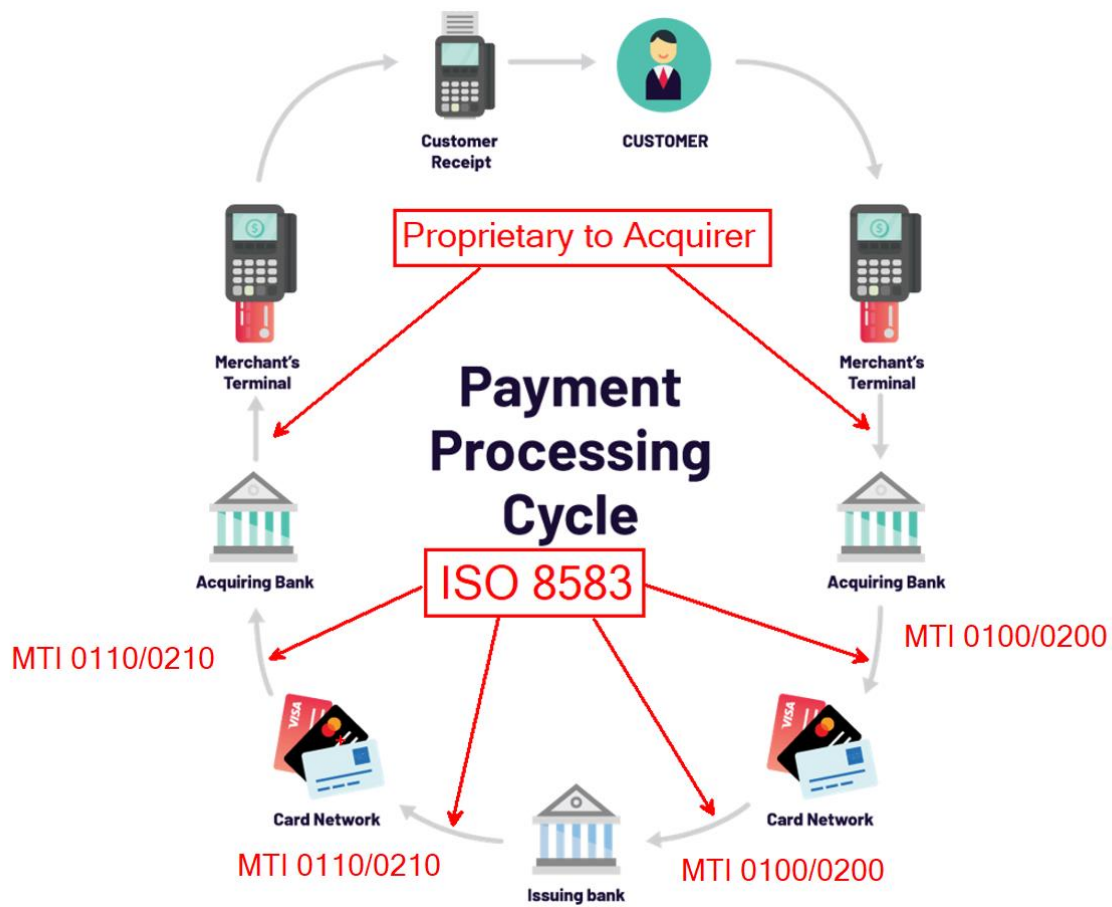


Figure 2 Payment Ecosystem example1

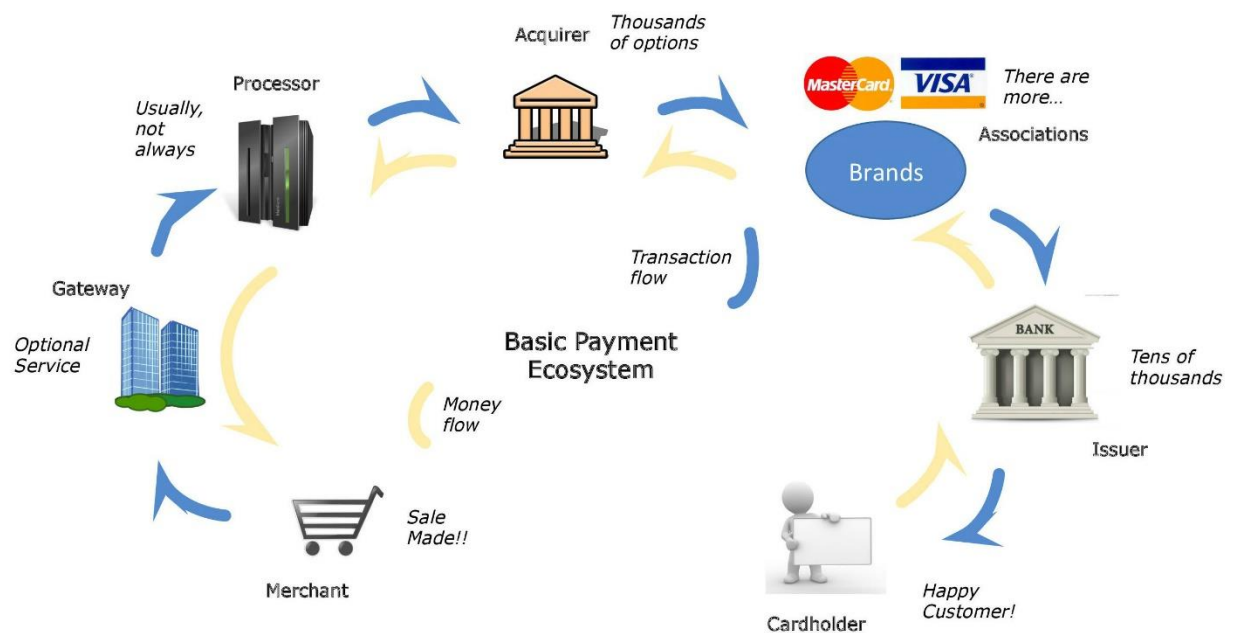


Figure 3 Payment Ecosystem example 2

9 Common Definition

9.1 Issuer

An issuing bank is a bank that offers card association branded payment cards directly to consumers, such as credit cards, debit cards, contactless devices such as key fobs as well as prepaid cards. The name is derived from the practice of issuing cards to a consumer.

9.2 Acquirer

An acquiring bank (also known simply as an acquirer) is a bank or financial institution that processes credit or debit card payments on behalf of a merchant.[1] The acquirer allows merchants to accept credit card payments from the card-issuing banks within an association. The best-known (credit) card associations are Visa, MasterCard, Discover, China UnionPay, American Express, Diners Club, Japan Credit Bureau and Indian Rupay.

The acquiring bank enters into a contract with a merchant and offers it a merchant account. This arrangement provides the merchant with a line of credit. Under the agreement, the acquiring bank exchanges funds with issuing banks on behalf of the merchant and pays the merchant for its daily payment-card activity's net balance—that is, gross sales minus reversals, interchange fees, and acquirer fees. Acquirer fees are an additional markup added to association interchange fees by the acquiring bank, and those fees vary at the acquirer's discretion.

9.3 Certification Authority, Payment Scheme, Switching Interface

Card schemes are payment networks linked to payment cards, such as debit or credit cards, of which a bank or any other eligible financial institution can become a member. By becoming a member of the scheme, the member then gets the possibility to issue cards or acquire merchants operating on the network of that card scheme. Visa and MasterCard are two of the largest global brands, known as card schemes, or card brands. Billions of transactions[3] go through their cards on a yearly basis.

9.4 Cardholder

A cardholder is a consumer, who owns the debit or credit card, issued by their bank, or other financial institution. They aren't legally obliged to use a single card scheme and may own various types of cards, issued by numerous institutions.

9.5 Issuer BIN's

Issuing Network	IIN Ranges	Length
American Express	34, 37[5]	15[6]
China T-Union	31	19
China UnionPay	62	16–19[8]
Diners Club International[9]	36	14–19[8]
Diners Club United States & Canada[10]	54	16
Discover Card	6011, 644-649, 65	16–19[8]
Discover Card	622126–622925 (China UnionPay co-branded)	16–19[8]
UkrCard	60400100–60420099	16–19
RuPay	60, 65, 81, 82, 508	16
RuPay	353, 356 (RuPay-JCB co-branded)	16

InterPayment	636	16–19
InstaPayment	637–639	16
JCB	3528–3589	16–19[8]
Maestro UK	6759, 676770, 676774[11]	12–19
Maestro	5018, 5020, 5038, 5893, 6304, 6759, 6761, 6762, 6763	12–19
Dankort	5019	16
Dankort	4571 (Visa co-branded)[12]	16
Mir	2200–2204	16–19
NPS Pridnestrovie	6054740–6054744	16
Mastercard	2221–2720[13]	16
Mastercard	51–55	16
Troy	65, 9792[15]	16
Visa	4	13, 16

Table 3 Examples of BIN

10 SMS Transaction

11 DMS Transaction

12 Reference

1. https://en.wikipedia.org/wiki/ISO_8583
2. <https://gandal.me/2014/08/09/a-simple-explanation-of-fees-in-the-payment-card-industry/>
3. https://en.wikipedia.org/wiki/Acquiring_bank
4. https://en.wikipedia.org/wiki/Issuing_bank#cite_note-2
5. https://en.wikipedia.org/wiki/Payment_card_number