



# MOBILE PAYMENT FORUM OF INDIA (MPFI)

(A non-profit registered society)  
Website: <http://www.mpf.org.in>  
E-mail: [mpfi@idrbit.ac.in](mailto:mpfi@idrbit.ac.in)

29-11-2010

## Amendments to Interoperability Standards for Mobile Payments

Based upon the inputs of the pilot for Interbank Mobile Payment Services (IMPS), the amendments to the earlier released MPFI Interoperability Standards for Mobile Payments document dated September 22<sup>nd</sup>, 2010 has been made in the present document. Members of Mobile Payment Forum of India (MPFI) and general public may send their comments and feed back, if any before December 15<sup>th</sup>, 2010 to Dr.Gaurav Raina (IIT-Madras): [gaurav@lantana.tenet.res.in](mailto:gaurav@lantana.tenet.res.in)

This document has been also uploaded onto the MPFI website for comments.

**Dr.V.N.Sastry**

**Executive Secretary (MPFI)**



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E-mail: [mpfi@idrbt.ac.in](mailto:mpfi@idrbt.ac.in)

**BY**

**The MPFI Technology Committee**

<b>VERSION</b>	<b>DATE</b>	<b>AUTHOR</b>	<b>COMMENTS</b>
V1 A.1	November 18,2010	TeNeT Group, IIT Madras	First Draft



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## Abstract

Mobile payments or m-payments may be defined, for our purposes, as information exchange between a bank and its customers for financial transactions through the use of mobile phones. Mobile payment involves debit/credit to a customer's account on the basis of fund transfer instruction received over the mobile phones [1]. A mobile payment system could supplement cheques and also other forms of payments, like debit and credit cards. Examples of a mobile device may include a mobile phone, a personal digital assistant, a wireless tablet or any other device that may connect to a mobile telecommunication network and make it possible for payments to be made. For our purposes, the mobile device is assumed to be uniquely identified by a telephone number and an IMEI number.

It shall be possible to let a Customer of a particular financial institution make a payment to a Customer associated with any other financial institution. This means that the mobile payment providers, financial institutions and network operators need to use open standards for interaction with each other to provide interoperability.

This document describes interoperability standards for mobile payments. It starts by describing the various entities and gives a description of the functions of each of the players involved.

It also provides an overview of the mode of payment, namely, the push process. This is followed by a detailed description of the processes including the complete details required for implementation for each of the entities that are involved in the process.

The document is intended for the implementation of interoperability standards by banks and the other entities that are involved in effecting mobile payments.



## 1 Modifications from v1.10

This version of the interoperability standards document has been significantly revised from the preceding version v1.10. This has been done to enhance security and usability for mobile payment users.

The major changes to take effect in this version are as follows: (a) removing the default account concept by (b) moving to a central switch architecture which uses (c) a seven digit identifier called Mobile Money Identifier (MMID) for each account belonging to a mobile phone number

## 2 Introduction

A mobile payment is defined as an information exchange between a bank and its customers for financial transactions through the use of mobile phones. Mobile payment involves debit/credit to a customer's account on the basis of fund transfer instruction received over the mobile phones [1]. Mobile payment can be made through a mobile device, such as a cellular telephone, a smart phone, or a personal digital assistant. Using m-payments, a person with a mobile device could pay for items in a store, settle a restaurant bill, or simply deposit money into a friends account. In essence, it is a financial transaction made via a mobile device between a customer (payer) and a beneficiary (payee).

This document describes the interoperability standards for mobile payments in India, and the requisite procedures that need to be followed when different entities communicate with each other during a mobile payment process. For the purposes of this document interoperability is defined as a property referring to the ability of diverse systems and organizations, for example Telecommunication Service Providers, Financial Institutions and Mobile Payment Providers, to work together (inter-operate).

This standard is defined for mobile payments as specified in the RBI Guidelines [1]. The standard has been defined with future requirements in mind. However, as and when the RBI issues new guidelines in future, the standard may need revision.

This document is for payments initiated from a mobile with transfer of funds from one bank account to another bank account. It does not cover mobile-initiated transactions that use other payment mechanisms such as ATM or credit card networks. Such other mechanisms may be incorporated in future versions of this standard.

[Section 1](#) lists the modifications of this standard document from the previous standard document v1.10. [Section 2](#) is an introduction to mobile payments and interoperability. Section 3 defines important entities involved and referred to in the document. [Section 4](#) is an overview of the payment process. [Section 5](#) lists the responsibilities of the different entities and [Section 6](#) outlines the registration process to be followed by the Customer. [Section 7](#) describes the confidentiality practices. The push model is described in detail in [Section 8](#). Finite state machines for each entity and the related transition tables are also illustrated in this section. The possible error scenarios and solutions have been listed in [Section 9](#). For each of transaction described in the earlier sections, message formats have been defined in [Section 10](#). [Section 11](#) explains the role of the transport layer and [Section 12](#) deals with the security aspects at the relevant interfaces. [Section 13](#) gives a brief about the changes for member banks both as remitter and beneficiary bank. Settlement and reconciliation is explained in [Section 14](#). [Section 15](#) describes the risk management. A



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table of default constant values is given in [Section 16](#) and a glossary of terms is provided in [Section 17](#). [Section 18](#) lists the related documents. The account holder's interaction with any of the other entities is out of the scope of this document.

## 2.1 Terminology

This standard has various elements, some mandatory, some optional, some advisory, etc. In this section, we define words and phrases that are used to specify the notion of the elements.

**Must:** This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification [6].

**Must Not:** This phrase, or the phrase "SHALL NOT", means that the definition is an absolute prohibition of the specification [6].

**Should:** This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course [6].

**Should Not:** This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label [6].

**May:** This word, or the adjective "OPTIONAL", means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option **MUST** be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option **MUST** be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.) [6]

**Such As:** This phrase means that the list of examples that follows is not exhaustive, and that other equivalents may also be used.

**Etc.:** This word means that the list preceding the word is not exhaustive and other equivalents may also be applied.

## 3 Entities Involved

The following entities are involved in a mobile payment process: Telecommunication Service Provider (TSP), Mobile Payment Provider (MPSP), Bank, Customer, Beneficiary and the National Payments Corporation of India . There could also be an entity called a Payment Settlement Agency (PSA). Figure 1 highlights the logical communication channels between the various entities in a mobile payment process. The Customer is registered with TSP A and is registered with at least one Bank/MPSP, MPSP A. The Beneficiary is registered to TSP B and is linked to at least one Bank/MPSP, MPSP B. Note that TSP A can be either same or different from TSP B. If both the parties have accounts in the same bank then MPSP A can also be either same or different from MPSP B. The various aforementioned entities are defined below.



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## 3.1 Telecommunication Service Provider

A licensed telecommunication company that provides mobile and other telecommunication services. TSPs are regulated by the Telecommunications Regulatory Authority of India (TRAI).

## 3.2 Bank

A "banking company" means any company which transacts the business of banking which is defined as accepting, for the purpose of lending or investment, of deposits of money from the public, repayable on demand or otherwise, and withdrawable by cheque, draft, order or otherwise [4].

Banks are regulated by the Reserve Bank of India (RBI).

For the purposes of this document, a Bank provides accounts to its Customers. An account is any financial instrument by which the Customer can make or receive payments to/from other parties. It includes current and savings accounts, debit cards, etc.

We note that an entity providing payment via prepaid cards as per the RBI guidelines issued on August 14, 2009 is also considered as a Bank for the purpose of this standard. As per the guidelines [5], such an entity will have restrictions on the transactions it can perform.

## 3.3 Mobile Payment Provider

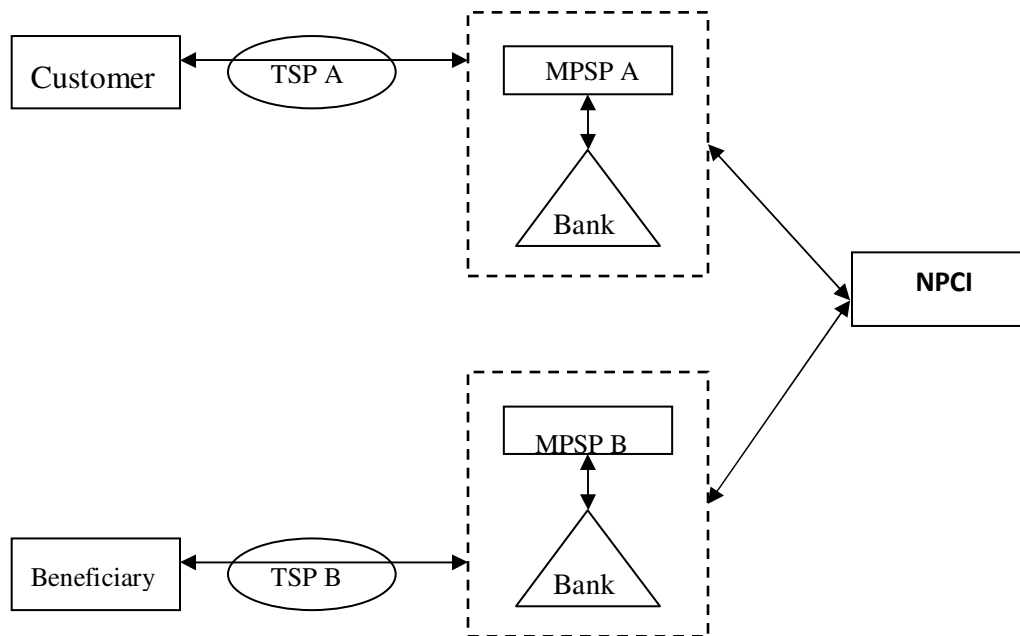
A logical entity which facilitates financial transactions between mobile phone Customers. An MPSP performs financial functions, as relating to a mobile payment on behalf of banks and it may also be a Mobile Payment Application Provider. A bank can choose to be its own MPSP or it can choose a third party to be its MPSP. An MPSP must be registered after due process by RBI.

## 3.4 Customer

The buyer, or payer, who purchases goods and/or services from another entity, sends a gift or pays a loan to another entity, etc.; essentially the person who pays the money. The Customer uses a bank account as defined in [Section 3.2](#) above. The Customer may have multiple bank accounts in one or more banks.

## 3.5 Beneficiary

The seller, or payee, who benefits from the purchase of a good and / or a service, receives a gift or repayment of loan, etc.; essentially the person who receives the money. The Beneficiary uses a bank account as defined in [Section 3.2](#) above to receive payments. The Beneficiary may have multiple bank accounts in one or more banks.



**Figure 1: Network diagram showing the logical communication channels and interoperability interfaces**

### 3.6 National Payments Corporation of India

National Payments Corporation of India (NPCI) is formed to switch all the retail payments and fund transfer transactions in India from a central Infrastructure.

NPCI intends to leverage the payment infrastructure to facilitate the online inter bank mobile remittance. This requires building an interface with the member banks systems to send and receive the online Mobile Remittance transactions.

NPCI will receive a 4 digit BankId which will be used to route the transaction to the intended destination bank. It is also be responsible for settlements between banks. It will be responsible for providing the above mentioned services for all Banks/MPSPs of the country, which are registered with it.

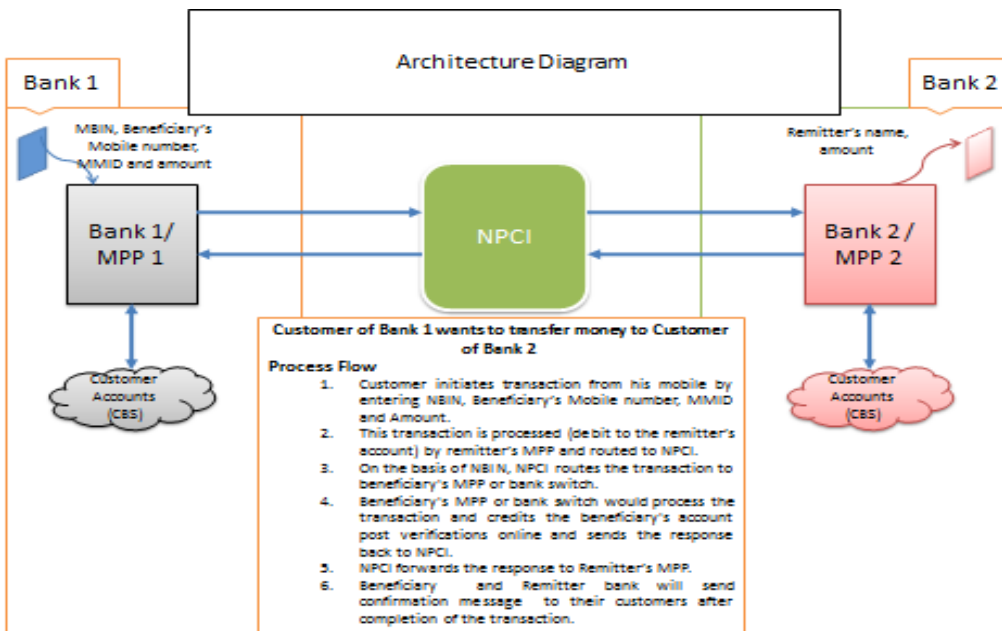
### 3.7 Payment Settlement Agency

NPCI's settlement agency, CCIL (Clearing Corporation of India Limited) will arrange the necessary inter-bank settlement of credits and debits to the banks' respective current accounts with RBI.

## 4 Payment Process Overview

For the mobile payment process to function we need the following entities. Customer/Remitter, Beneficiary, Customer/Remitter's Bank, Beneficiary's Bank and the NPCI.

The architecture diagram is shown in Figure 2 and the following sub section gives an overview of the payment process.



**Figure 2: Architecture Diagram**

## 4.1 Push Process

The payment process has been defined only for the Push Process where the Customer initiates the transaction. The transaction initiated by the Customer will require the Beneficiary's mobile phone number, a 7 digits MMID and amount to be entered. The transaction is routed to NPCI via the (MPSP and) Bank where the MMID is used to perform routing of the transaction to the Beneficiary's Bank. At the end of the transaction a notification will be sent to either of the parties.

On successful transaction the Customer's account will be instantly debited and also the Beneficiary's account will be credited immediately. The funds transfer between the Customer's and Beneficiary's Bank is not real-time and may actually take place later in batch mode via NEFT or other settlement mechanism.

The details of the process are described in [Section 8.1](#).

## 4.2 Security

Security of TCP link for Bank-MPSP uses SSL/TCP. There will be a separate document on Security.

## 5 Responsibilities of Different Entities

### 5.1 Bank

Bank will be responsible for generating the Mobile Account Selector (MAS) for each of its mobile payment subscriber. The MAS will be unique for all accounts registered with a particular phone number. The Banks are also expected to map the 4 digit BIN entered by the customer to a 6 digit Bank Id used for input to NPCI.



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Customer's Bank will be responsible to do all the following checking,

- 1) Balance authorization.
- 2) Mobile Number and account Validations/Verifications.
- 3) Number of Transactions in a day.
- 4) Multiple Requests from same handset within X time period with same ref/transaction number (This is to avoid multiple requests for the same transactions).
- 5) Maximum limit in a day.
- 6) AML related validations for Funds Transfer transaction for the debit leg (online or offline).
- 7) Fraud Check (online or offline).
- 8) Ensure that alert SMS for Debit leg will be sent to sending customer with details of sender's and Beneficiary details.
- 9) Population of correct values in verification request.
- 10) NPCI will not validate or match any of the values sent in the verification request with the original transaction.

Beneficiary Bank will be responsible for following checking,

- 1) Transaction and incoming message validation coming from NPCI.
- 2) Destination mobile number validation and posting of transaction to the linked primary account number.
- 3) Ensure that alert SMS for credit leg will be sent to beneficiary customer with details of remitter's and Beneficiary's details.
- 4) Beneficiary must send the response with beneficiary name and account number. If unable to do so, beneficiary bank can decline the transaction.
- 5) In case of the beneficiary account is in lien or blocked or any other condition which is banned by regulatory for credit transaction, transaction shall be declined by beneficiary bank.
- 6) Multiple Requests from same handset within X time period with same ref/transaction number (This is to avoid multiple requests for the same transactions).
- 7) Maximum limit in a day.
- 8) AML related validations for Funds Transfer transaction for credit leg (online or offline).
- 9) Fraud Check (online or offline).
- 10) Validate the value of original transaction in the verification request sent by Remitter bank and respond appropriately.

## 5.2 MPSP

The MPSP acts as an intermediary between the account holder and the financial institution. As such the MPSP is responsible for:

- 1) Maintaining full details of all transactions in order to support auditing and to answer Customer queries. To answer Customer queries the MPSP must be informed about the status of the transaction and this can be done by querying the Bank for the status of any transaction.



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- 2) The MPSP shall provide a mechanism by which the Customer can check the status of recent transactions, and can file a request for reconciliation in case of dispute.

## 5.3 NPCI

NPCI will be responsible for switching all mobile payment transactions from remitting Bank to Beneficiary Bank

## 5.4 TSP

TSPs are expected to conform to all the responsibilities as defined by TRAI. No extra responsibilities are defined for the purpose of this document.

## 6 Registration Process

All subscribers need to be registered with the Bank and all Banks providing mobile payment service should be registered with NPCI.

### 6.1 Registration with the Bank

Bank customers willing to participate in Mobile Payment Service offered by banks need to register for the service with their respective banks. The registration procedure should be safe and secure and would be defined by individual member banks.

While registering a customer, the bank would communicate to the customer a three digit random code called MMID and the National Bank Identification Number (NBIN).

- a) MAS helps in checking the correctness of the beneficiary's mobile number and eliminates the possibility of a remitter sending a payment request to an unintended mobile number, inadvertently. It also facilitates registration of multiple accounts to a single mobile phone.
- b) National Bank Identification Number (**NBIN**) indicates the unique identification number of the bank offering mobile payment service. (The same has been referred to as MBIN in earlier documents)

In the initial phase, the mobile number of the beneficiary needs to be accompanied by the 4 digit NBIN and 3 digit MAS. Thus the structure of the unique destination of a mobile banking customer would be

**4 digit NBIN + 10 digit Mobile number + 3 digit MMID**

These 17 digits would uniquely identify a bank account linked with a mobile.

### 6.2 Registration with NPCI

Will be done by Banks and NPCI

## 7 Confidentiality Practices

- (1) The Beneficiary's account number is never revealed to the Customer except possibly for dispute resolution.



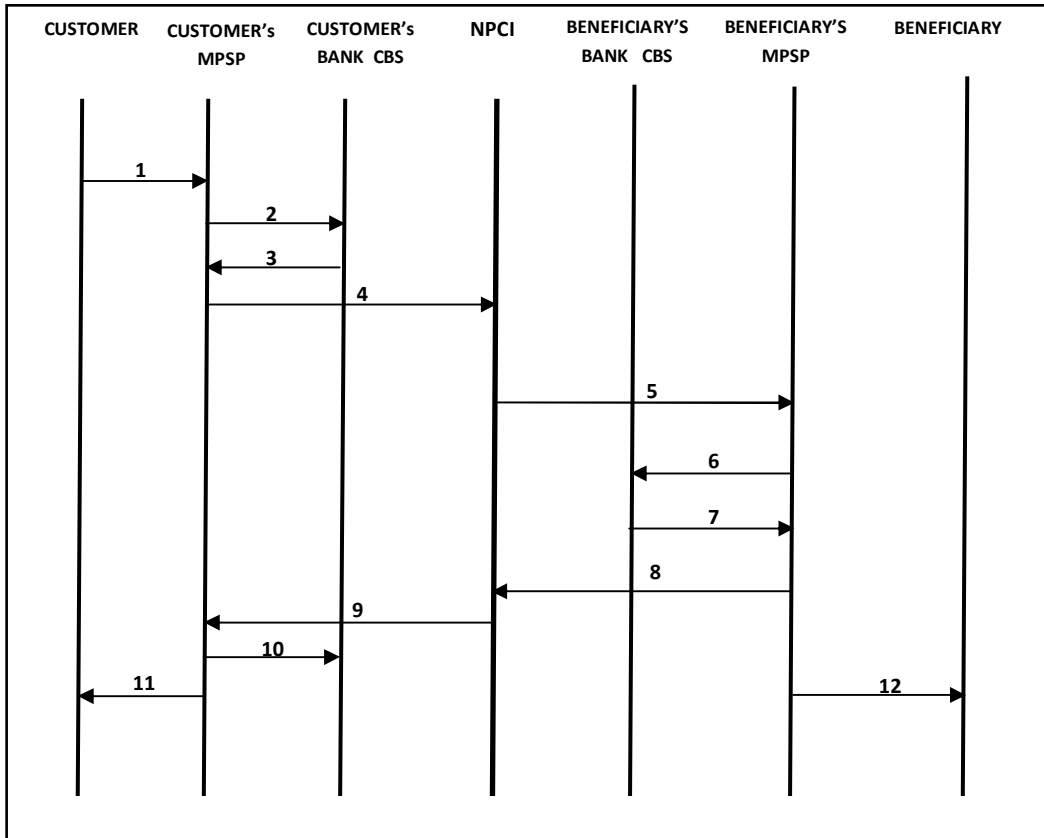
## 8 Payment Process Details

This section describes the flow of operations and a representative interaction diagram for the various entities in the Push process of payment. It also describes in detail the Finite State Machines for the Push processes. In both the flow of operations and in the interaction diagram, we only highlight a caricature of a typical successful transaction. Errors and situations that may lead to an unsuccessful transaction will be considered in detail later in the document.

We first outline the flow of operations, and then show a diagram Figure 3 that captures the interaction between the various entities in the Push process of payment.

The flow of operations in the Push process is outlined below:

- (1) Customer inputs the Beneficiary mobile number, MMID along with NBIN (routing detail) and the amount which needs to be sent to the beneficiary.
- (2) Customer's MPSP receives the request for remittance from customer and it sends the request to Customer's Bank for debiting the account.
- (3) Customer's Bank on receiving the request from MPSP debits the customer's account and sends confirmation to the MPSP.
- (4) MPSP on receiving the confirmation sends the transaction to NPCI to be forwarded to the respective institution of Beneficiary.
- (5) After resolution of destination (mapping of NBIN with Bank would be kept on Switch), NPCI sends the transaction to Beneficiary's MPSP.
- (6) Beneficiary's MPSP will send the transaction to Beneficiary's Bank for crediting the account.
- (7) After crediting Beneficiary's account, Bank sends a confirmation to Beneficiary's MPSP.
- (8) After receiving the confirmation, MPSP sends the confirmation to NPCI.
- (9) NPCI sends the confirmation to MPSP of the Customer.
- (10) Customer's MPSP sends the confirmation message to Customer's Bank.
- (11) Customer MPSP sends a confirmatory message to customer stating completion of transaction.
- (12) Beneficiary's MPSP sends the confirmation to customer stating account being credited with certain amount.



**Figure 3: Customer-Beneficiary Remittance Transaction Interaction Diagram (Push Method)**

## 8.1.1 Finite State Machines for the Push Process

We first outline the flow of operations in the Push process, and then discuss the error scenarios that may occur in such a process.

### 8.1.1.1 Customer

In this section we outline the various states (Table 1) and events (Table 2) that a Customer goes through in the push mode of payment. Note that the diagram in Figure 4 is a representation of these tables in which impossible or ignored <state, event> pairs are not shown. The corresponding transition table is shown in Table 3, where, in each cell, the action is shown in italics and the next state is shown below that.

When the transaction begins, the Customer is in *Start* state where he is ready to initiate the payment transaction request which contains the Beneficiary's and Customer's mobile phone number, MMID and the amount to be paid. After sending the request, the Customer transits to another state where he *Waits for Notification* from the MPSP. In this state the Customer can receive various events.



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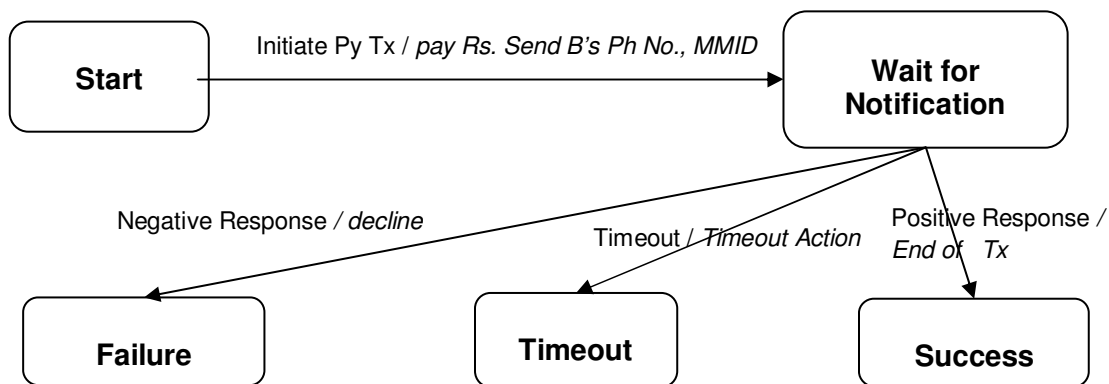
- 1) *Positive Response*: This event occurs when the Customer receives a positive notification from his MPSP. This message ends the payment transaction as it is successful and he moves to *Success* state.
- 2) *Negative Response*: The Customer might receive this when the transaction is declined due to various reasons like non-existent of funds in his account etc., The transaction is cancelled by thereby moving the Customer to the *Failure* state.
- 3) *Timeout*: Customer Times Out waiting for notification from his MPSP. The information is either lost, delayed. A Timeout action can occur where the Customer can re-initiate the transaction or invoke the dispute mechanism, as applicable. This takes the Customer to the *Timeout* state.

**Table 1: List of States for Customer**

State	Description
Start	Customer is ready to initiate a new payment transaction request
Wait for Notification	After initiating the payment transaction request the Customer is waiting for the fund transfer notification from his MPSP
Success	The transaction initiation is successful. Customer has received positive notification from his MPSP regarding funds transfer.
Failure	Transaction initiation was unsuccessful.
Timeout	The mobile payment application and/or the Customer may decide to retry or abandon or take any other action

**Table 2: List of Events for Customer**

Event	Description
Initiate Payment Transaction	Customer initiates the payment transaction using some mobile payment application
Positive Response	Customer receives the notification from his MPSP thereby marking the end of the transaction.
Negative Response	Customer receives a negative notification from his MPSP. The transaction is declined due to various reasons.
Timeout	Notification does not arrive within the timeout period



**Figure 4: State Machine for Customer**

**Table 3: Transition Table for Customer's FSM**

<i>Event</i> \ <i>State</i>	<i>Start</i>	<i>Wait for Notification</i>	<i>Success</i>	<i>Failure</i>	<i>Timeout</i>
<b>Initiate Payment Transaction</b>	<i>Send Payment transaction info to Customer's MPSP</i> ->Wait for Notification	Null (duplicate)	Null (duplicate or delayed)	Null (duplicate or delayed)	Null (duplicate or delayed)
<b>Positive Notification</b>	NA	<i>End of Transaction</i> -> Success	Null (duplicate)	Null (delayed)	Null (duplicate or delayed)
<b>Negative Notification</b>	NA	<i>Decline</i> -> Fail	NA	Null (duplicate)	Null (duplicate or delayed)
<b>Timeout</b>	NA	<i>Timeout</i> -> Timeout	NA	NA	NA

Null (duplicate): ignore the duplicate event.

Null (delayed): ignore the delayed event.

NA: not applicable – this <state, event> pair should never occur. Usually indicates a software bug and should be logged and reported to the software developers.

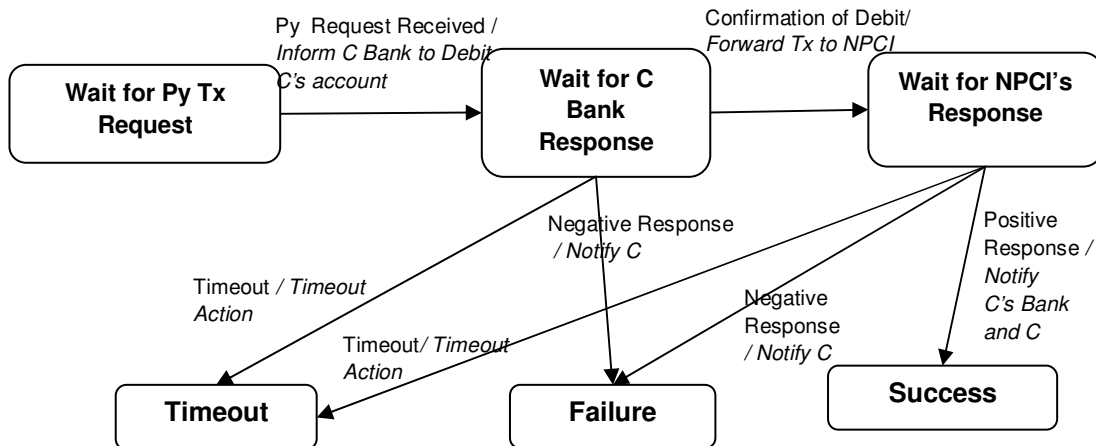
### 8.1.1.2 Customer's MPSP

In this section we outline the various states (Table 4) and events (Table 5) that a Customer's MPSP goes through in the push mode of payment. Note that the diagram in Figure 5 is a representation of these tables in which impossible or ignored <state, event> pairs are not shown. The corresponding transition table is shown in Table 6, where, in each cell, the action is shown in italics and the next state is shown below that.

Customer's MPSP is initially in state of *Waiting for a Payment Transaction Request* to arrive. When the payment request is received, the Customer's MPSP sends a message to the Customer's Bank to Verify C's Bank account and to debit Customer's account and then moves to a state *Waiting for Customer's Bank Response*.

During this state, the following events can occur:

- 1) When the Customer's Bank confirms the debit from Customer's account then MPSP forwards the transaction information to NPCI and moves to waiting for response from NPCI state.
- 2) Negative Response: This event may occur due to various reasons like if the Customer's account is invalid, nil balance, etc., then the MPSP informs Customer and moves to *Failure* state.
- 3) Timeout: Customer's MPSP *Times Out* waiting for a response from the Customer's Bank which is either lost or delayed. A *Timeout* action occurs in this case. The Customer's MPSP moves to the *Timeout* state.



**Figure 5: State Machine for Customer's MPSP**

While the Customer's MPSP is waiting for NPCI to send a response, the following events can be encountered in this state:

- 4) Positive Response: This event happens when the payment transaction has gone through successfully and money has been credited to Beneficiary's account. Customer's MPSP informs the Customer and his Bank about the successful transaction.
- 5) Negative Response:
- 6) Timeout: Customer's MPSP *Times Out* waiting for a response from the NPCI which is either lost or delayed. A *Timeout* action occurs in this case. The Customer's MPSP moves to the *Timeout* state.

**Table 4: List of States for Customer's MPSP**

State	Description
Wait for Payment Transaction Request	Customer's MPSP waits for the payment transaction request from Customer
Wait for C Bank Response	Customer's MPSP waits for debit information from Customer's Bank
Wait for NPCI's Response	Customer's MPSP forwards the payment transaction information to NPCI and waits for its response
Success	Mobile payment transaction is successfully completed
Failure	Mobile payment transaction is unsuccessful due to a negative response from the NPCI
Timeout	Timeout event occurs when either one of the following occurs: <ul style="list-style-type: none"> <li>• The Bank's response has not reached the MPSP</li> <li>• Customer's MPSP does not receive a response from NPCI</li> </ul>



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**Table 5: List of Events for Customer's MPSP**

Event	Description
Payment Request Received	Customer's MPSP receives payment transaction request from the Customer
Confirmation of Debit	Customer's MPSP requests Customer's Bank to debit Customer's account and Customer's Bank after verification debits his account
Positive Response	NPCI sends a positive response to the Customers' MPSP and this ends the transaction successfully
Negative Response	Negative response can occur at the following places: <ul style="list-style-type: none"> <li>• During debiting Customer's account error may have occurred due to nil balance, invalid Customer, etc.,</li> <li>• NPCI send a negative response that cancels the transaction. This may occur due to various reasons like invalid Bank, etc.,</li> </ul>
Timeout	Timeout Occurs when there is no response received within a specified time mentioned in Section9. <ul style="list-style-type: none"> <li>• When a timeout occurs during <i>wait for C Bank Response</i> state, reversal will be generated by the Customer's bank to its CBS and the transaction is not processed further. Customer will be appropriately informed.</li> <li>• When a timeout occurs during <i>wait for NPCI Response</i> state, Customer Bank will treat this as timeout transaction and Customer bank will send out a Verification Request giving the reference number of the original transaction to NPCI and based on the verification request response will reverse the earlier debit.</li> </ul>



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**Table 6: Transition Table for Customer's MPSP's FSM**

<i>State</i> <i>Event</i>	Wait for Transaction Request	Wait for C Bank Response	Wait for NPCI's Response	Success	Failure	Timeout
<b>Payment Request Received</b>	<i>Inform C Bank to Debit C's account</i>  -> Wait for C Bank Response	Null(duplicate )	Null(duplicate)	Null (duplicate or delayed)	Null (duplicate or delayed)	Null (duplicate or delayed)
<b>Confirmation of Debit</b>	NA	<i>Forward Tx to NPCI</i> -> Wait for NPCI's Response	Null(duplicate)	Null (duplicate or delayed)	Null (duplicate or delayed)	Null (duplicate or delayed)
<b>Positive Response</b>	NA	NA	<i>Notify C's Bank and C</i> ->Success	Null (duplicate)	Null (delayed)	NA
<b>Negative Response</b>	NA	<i>Notify C</i> ->Failure	<i>Notify C</i> ->Failure	Null (duplicate)		
<b>Timeout</b>	NA	<i>Timeout Action</i> -> Timeout	<i>Timeout Action</i> -> Timeout			

Null (duplicate): ignore the duplicate event.

Null (delayed): ignore the delayed event.

NA: not applicable – this <state, event> pair should never occur. Usually indicates a software bug and should be logged and reported to the software developers.

### 8.1.1.3 NPCI

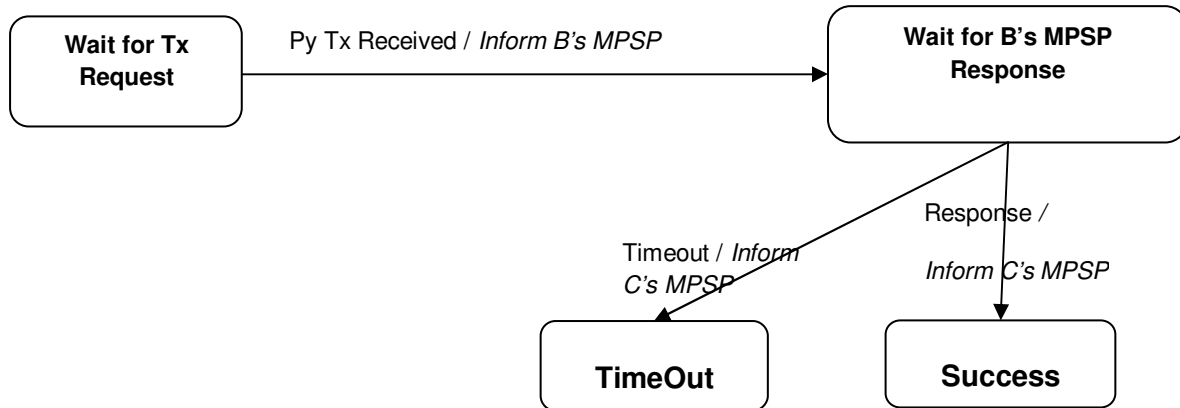


Figure 6: State Machine for NPCI

Table 7: List of States for NPCI

State	Description
Wait for Tx Request	NPCI waits for the payment transaction request from Customer's MPSP
Wait for B's MPSP Response	NPCI waits for response from B's MPSP
Success	NPCI receives response from B's MPSP
Timeout	Timeout event occurs when there is no response from Beneficiary's MPSP within a specified time

Table 8: List of Events for NPCI

Event	Description
Payment Request Received	NPCI receives payment transaction request from the Customer's MPSP
Response	NPCI receives response from the Beneficiary's MPSP and this ends the transaction
Timeout	Timeout Occurs when there is no response received within a specified time mentioned in Section9.

Table 9: Transition Table for NPCI FSM

State \ Event	Wait for Transaction Request	Wait for B's MPSP Response	Success	Timeout
Payment Request Received	Inform B's MPSP -> Wait for B's MPSP Response	NA	NA	NA
Response	NA	Inform C's MPSP ->Success	NA	NA
Timeout	NA	Inform C's MPSP -> Timeout	NA	NA

### 8.1.1.4 Beneficiary's MPSP

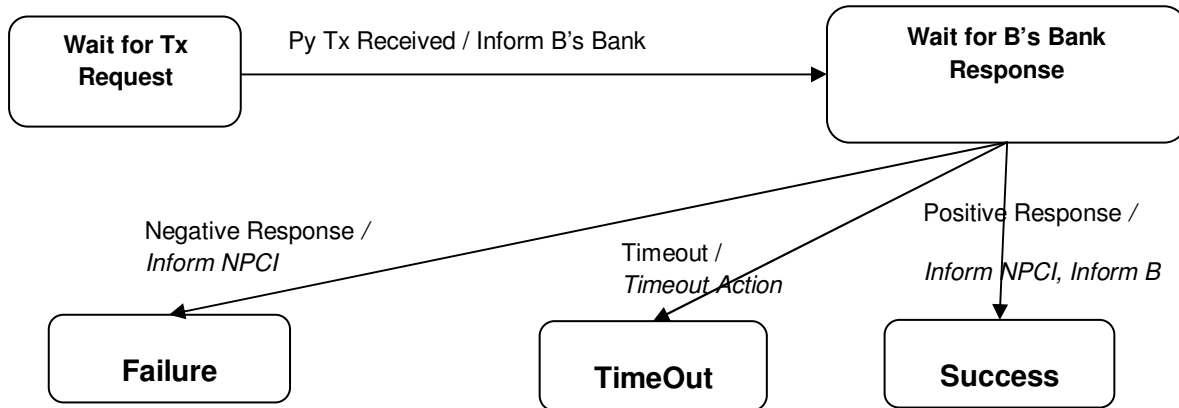


Figure 7: State Machine for Beneficiary's MPSP

Table 10: List of States for Beneficiary's MPSP

State	Description
Wait for Tx Request	B's MPSP waits for payment transaction request from NPCI
Wait for B's Bank Response	B's MPSP waits for response from B's Bank
Success	B's MPSP receives positive response from B's Bank
Failure	B's MPSP receives negative response from B's Bank
Timeout	Timeout event occurs when there is no response from Beneficiary's



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	Bank within a specified time
--	------------------------------

**Table 11: List of Events for Beneficiary's MPSP**

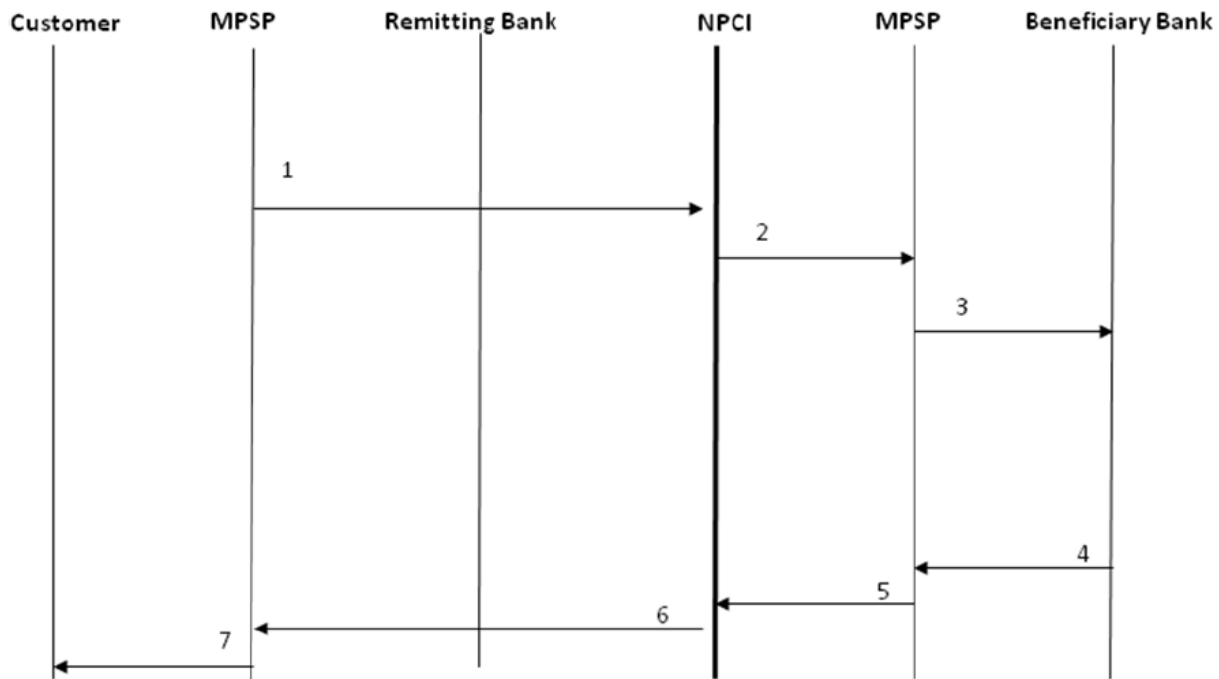
Event	Description
Payment Transaction Received	B's MPSP receives payment transaction request from the NPCI
Positive Response	B's MPSP receives positive response from the Beneficiary's Bank and sends notification to NPCI and B
Negative Response	B's MPSP receives negative response from the Beneficiary's Bank and sends notification to NPCI
Timeout	Timeout occurs when there is no response received within a specified time mentioned in Section9.

**Table 12: Transition Table for Beneficiary's FSM**

Event \ State	Wait for Transaction Request	Wait for B's Bank Response	Success	Failure	Timeout
<b>Payment Transaction Received</b>	<i>Inform B's Bank</i>  -> Wait for B's Bank Response	NA	NA	NA	NA
<b>Positive Response</b>	NA	<i>Inform NPCI, Inform B</i> ->Success	NA	NA	NA
<b>Negative Response</b>	NA	<i>Inform NPCI</i>  -> Failure	NA	NA	NA
<b>Timeout</b>	NA	<i>Inform NPCI</i>  -> Timeout	NA	NA	NA

### 8.1.1.5 Verification Request Process Flow

The following diagram explains the process flow of the verification request. The verification request is sent in case of timeout scenarios which are explained in the [section 9](#).



**Figure 8: Verification Request Process Flow Diagram**

**Table 13: List of abbreviations used in FSMs**

Abbreviation	Expansion
B	Beneficiary
C	Customer
Info	Information
Py	Payment
Tx	Transaction
Id/id	Identifier

## 9 Error scenarios

In this section we describe the error scenarios that can possibly occur in a mobile payment transaction.

Timeout scenarios for verification request:

- 1) In case of timeout scenarios Customer/Remitting bank will send the Verification Request post timeout period of Original Transaction (30 Sec)
- 2) The Verification request will carry the Original Transaction Elements. (Remitting Bank may send max up to 3 Retrieval Requests for one transaction, if it does not get a response)
- 3) Beneficiary bank will respond to this request as per status of the original transaction
- 4) Based on response to this request, Remitting Bank may reverse the earlier debit.
- 5) NPCI at the end of the day will ensure that status of the verification request transaction is reflected in the settlement.

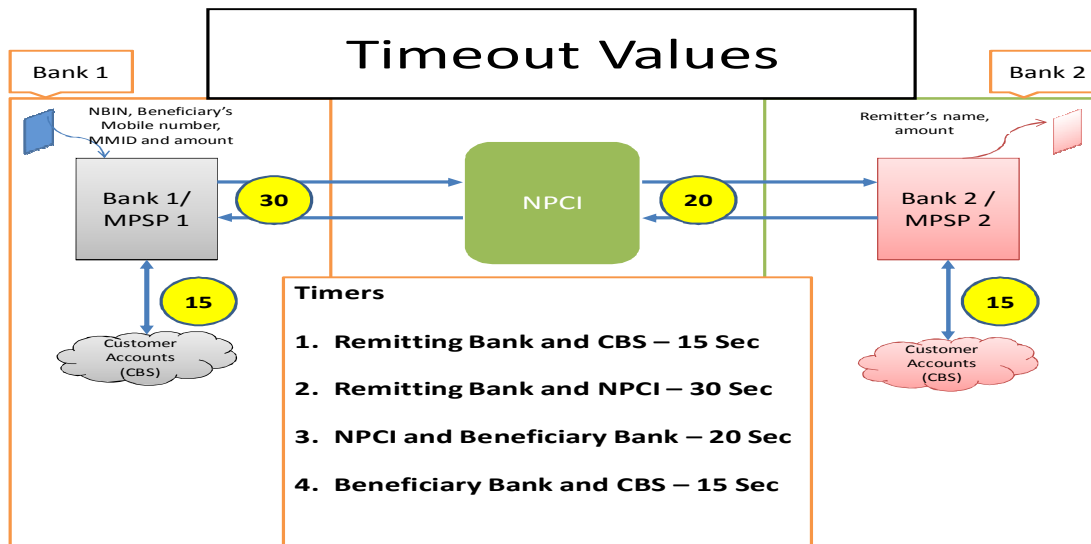


Figure 9: Timeout Values

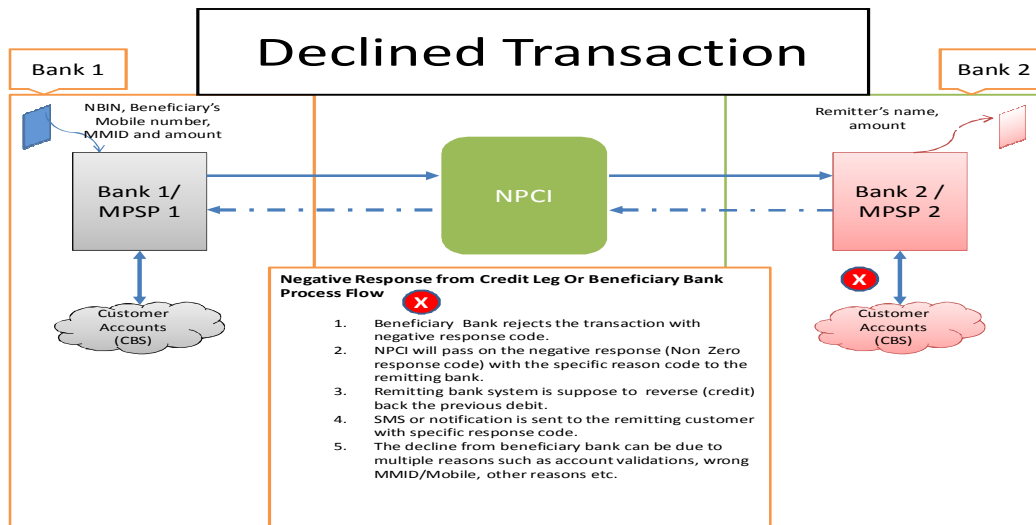
## 9.1 Error Conditions

The following will be the timeout scenarios:

- 1) When there is a timeout during debit, between Remitting Bank and its CBS, reversal will be generated by the Remitting Bank and the transaction is not processed further. The Customer is appropriately informed.
- 2) When there is a timeout after debit between Remitting Bank and NPCI, Remitting Bank will send a verification request giving the reference number of the original transaction to NPCI and based on the verification request response will reverse the earlier debit.
- 3) Another scenario is after debit, a timeout can occur between NPCI and Beneficiary Bank. This scenario is taken care of by sending a timeout response code by NPCI to the Remitting Bank. The Remitting Bank will then send a verification request which has the reference number of the original transaction. If the response of the verification request is "MO" (refer Table 18) then remitting Bank will reverse the earlier debit.
- 4) At the Beneficiary side when a timeout occurs between its Bank and CBS the transaction will be responded by sending a timeout response code to NPCI. It is then passed on to the Remitting Bank. The Remitting Bank will then send a verification request which has the reference number of the original transaction. If the response of the verification request is "MO" (refer Table 18) then remitting Bank will reverse the earlier debit.

## 9.2 Declined Transaction

When the Beneficiary Bank declines the transaction due to multiple reasons like account invalidation, wrong mobile number etc., it sends a negative response code to NPCI.



NPCI will pass on the negative response code with the specific reason code to the Remitting Bank. The Remitting Bank will reverse the previous debit and an sms is sent as a notification to the Remitting Customer with specific code.

## 10 Message Formats

For this mobile payment standard the ISO 8583 is preferable as it will simplify integration with other payment networks in future. In this standards document we are use ISO 8583-1:1987 version.

This section describes the ISO 8583-1:1987 version messages with detailed explanation of data elements used in the ISO messages for each of the administrative and financial messages.

The first column lists the Bit number of the data elements that are needed in a particular message. The second column gives the corresponding ISO 8583 name for the field. The third and fourth column indicates whether a field is Mandatory, Optional or Reserved for future use for that particular Message Type.

In all the messages that will be used, the TCP header should be in Hex with a length of two bytes. Bitmap should be Hex representation of binary value with a length of 16 bytes.

All message format definition tables use the symbols defined in the following table:

**Table 14: Symbols Used in the Message Tables**

Symbol	Meaning
M	Mandatory.
M+	Mandatory, echoed from request.
C	Conditional.
C+	Conditional, echoed from request.
C*	Conditional, value may change.
O	Optional.



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O+	Optional, echoed from request.
R	Reserved for future use.
-	Not used.

## 10.1 Administrative Messages

The administrative messages are used to check whether the systems connected to it are alive and the messages sent will be asynchronous.

Bank Systems and NFS systems will connect to each other using persistent socket connections.

Bank will act as client and NFS will act as server. Banks will be responsible to generate the logon (0800 message type) message after every successful TCP socket connection. NFS will generate cut over message (0800 message type) at 23:00 indicating business date change over. Banks and NFS will also generate Echo message (0800 message type) for keep alive during no transaction time. Ideal duration for the same should be 10 minutes.

The Mandatory and optional fields that will be used as the administrative messages are shown in Table 15. Message type 0800 is echo request message and 0810 is echo response message that is generated in response to the echo request message. The response codes are given in Table 18.

**Table 15: Administrative Messages**

Bit No.	Data Element	0800	0810
1	Secondary bitmap	M	M
7	Transmission date/time	M	M
11	STAN	M	M
15	Date, settlement	C	C+
32	Acquirer institution ID	O	O+
39	Response code	-	M
48	Key Data (Optional – Dynamic Key Exchange)	M	-
64	MAC Code (Optional – MACing)	R	R
70	NMIC (This will indicate the message is either logon/logoff/cut off/echo)	M	M
128	MAC Code 2 (Optional – MACing)	R	R

## 10.2 Financial messages

In Bank – Bank interface these financial messages are used. These messages are routed from the Remitting Bank to the Beneficiary Bank through the NPCI.

The message types used in the financial messages are 0200 for the request message and 0210 for response message.

The financial messages can be of two types, namely remittance transaction and verification transaction. Remittance transaction is the original message that is generated when the customer initiates the payment.



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When there is a timeout for the original initiated transaction then verification transaction message is sent by the Remitting Bank.

Table 16 shows the list of mandatory, optional and conditional fields used in financial messages. The data elements used in the remittance and verification transaction are explained in detail in [Section 10.3.15](#).

The response codes are given in Table 18. The main difference between the remittance and verification message is in the data element field 120.

**Table 16: Financial Messages**

Bit No.	Data Element	0200	0210
1	Secondary bitmap	C	C
2	Primary Account Number	M	M+
3	Processing code	M	M+
4	Amount, transaction	M	M+
5	Amount, settlement	C	C+
7	Date/time, transmission	M	M
8	Fee, cardholder billing	R	R
9	Conversion rate, settlement	C	C+
11	STAN	M	M+
12	Time, local transaction	M	M+
13	Date, local transaction	M	M+
14	Date, expiration	C	-
15	Date, settlement	C	C+
18	Merchant type	M	M+
22	POS entry mode	M	M+
25	POS condition code	M	M+
26	POS PIN capture code	C	-
32	Acquirer institution ID	M	M+
35	Track 2 data	C	-
37	Retrieval reference number	M	M+
38	Authorization number	-	C
39	Response code	-	M
41	Card acceptor terminal ID	M	M+
42	Card acceptor ID	M	M+
49	Currency code, transaction	M	M+
50	Currency code, settlement	C	C+
52	PIN Block	C	-
54	Additional amounts	-	C
64	MAC code	R	R
102	Account 1 identification	C	C
103	Account 2 identification	C	C



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120	Additional Data	M	M
121-123	Private use	C	C*
128	MAC Code 2	R	R

## 10.3 Data Element Definitions

### 10.3.1 DE-2 Primary Account Number, PAN

Format: LLVAR Type: n...19

Description: The PAN number is the combination of 4 digit NBIN number, 10 digit Mobile number, 1 digit Indicator (value 0-UID and 1-Mobile) 4 digits reserved for future use. It is mandatory for all 02xx and 04xx messages.

Field Edits: If present, it should be echoed in response and all subsequent messages.

Structure:

<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>BR</b>	<b>BR</b>	<b>I</b>	<b>BR</b>	<b>BR</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

B – NBIN (National Bank Identification Number)

BR – Reserved (To be filled with zeros)

M – Mobile number

I – Indicator (value '0' – UID and '1' – Mobile)

Note – All Remitters and Beneficiary's will have to incorporate reserved digits for future use so that whenever NPCI sends addendums or circular without any changes in the systems, it can be incorporated.

### 10.3.2 DE-3 Processing Code

Format: Fixed Length Type: n6

Description: A series of digits that describes the type of transaction and the accounts affected by the transaction. It consists of three, two-digit subfields:

#### Digit 1 and 2: Transaction Code

00	Purchase of goods/services
01	Cash withdrawal
20	Credit, refund
21	Deposit
22	Credit adjustment
31	Balance inquiry
<b>90</b>	<b>Extended transaction type**</b>

#### Digit 3 and 4: From Account Type\*

<b>00</b>	<b>Unspecified/unknown</b>
10	Savings
20	Checking
30	Credit cards

#### Digit 5 and 6: To Account Number\*

<b>00</b>	<b>Unspecified/unknown</b>
10	Savings
20	Checking
30	Credit card



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It is mandatory for all 02xxmessages.

Notes: \* Other values may be used for optional features.

Field Edits: If present, it should be echoed in response and all subsequent messages.

### 10.3.3 DE- 11 STAN (System Trace Audit Number)

Format: Fixed Length

Type: N6

Description: A unique number (within one business day) used for matching response message to request message. It is not intended to remain the same throughout the life of a transaction (e.g. STANs in the reversal and/or store/forward messages will differ mutually, and from STAN of the original transaction). STAN is mandatory for all messages. This can be generated by mobile application or remitting bank systems.

Field Edits: STAN is set by a message sender and echoed by the message receiver.

### 10.3.4 DE-18 Merchant Category Code (MCC)

Format: Fixed Length

Type: n4

Description: MCC is four-digit code in accordance with the Visa/MasterCard MCC definitions. The data element is mandatory for 02xx request messages. It is never present in response messages.

The proposed values are 4814 – Financial Institutions providing remittance through Mobile Phone

### 10.3.5 DE-22 Point of Service Entry Mode

Format: Fixed Length Type: n3

Description: The code describing the way PAN (card number) and PIN are entered at a touch point. Data element consists of two sub-fields:

#### PAN Entry Mode

01	Manual
02	Magnetic stripe read.
05	ICC.
90	Full and unaltered magnetic stripe read

#### PIN Entry Mode

0	unspecified
1	PIN entry capability
2	No PIN entry capability
6	PIN pad inoperative
9	<b>Reserved for private use</b>

The data element is mandatory for 02xx request messages. It is never present in response messages

### 10.3.6 DE-25 Point of Service Condition Code

Format: Fixed Length

Type: n2

Description: Two-digit code indicating conditions at touch point:



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Table 17: Table for POS Condition Code

Two-digit code	Description
00	Normal
01	Customer not present
02	Unattended terminal (CAT, ADM)
03	Merchant suspicious
05	Customer present, card not present
07	Telephone request
08	MO/TO request

### 10.3.7 DE-32 Acquiring Institution Identification Code

Format: LLVAR

Type: n..11

Description: Identifies the acquiring institution for the transaction, or its agent. The value will be defined by the host. The data element is mandatory for 02xx request messages. It is optional for 08xx messages.

Field Edits: If present, it should be echoed in response and all subsequent messages.

Constraints: O: Member can choose whether to use DE-32 in 08xx messages or not.

**Note - NPCI shall assign appropriate codes to the participating banks to be used in this field.**

### 10.3.8 DE-37 Retrieval Reference Number

Format: Fixed Length

Type: AN12

Description: The reference, assigned by the acquirer, to identify a transaction uniquely. It remains unchanged for all messages throughout the life of a transaction and is used for matching original message with reversal and/or store/forward messages. The standard format of RRN is as follows:

YDDHHSSSSSS

Y – Last digit of year

DDD – Julian date of transaction

HH – Hour of transaction

SSSSSS – STAN of transaction (Same as in DE -11)

The data element is mandatory for 02xx, and 04xx request messages. The RRN can be used for the entire dispute management of the transaction lifecycle.

In verification request value of DE-37 should be same as original remittance transaction RRN



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Field Edits: It must be echo back in response message

## 10.3.9 DE-39 Response Code

Format: Fixed Length

Type: an2

Description: This code indicates the disposition of a message as detailed tables below.

Each code is associated with specific action code that is to be taken:

A Approve transaction D Decline transaction.

Field Edits: In reversal and store/forward requests, value identifies the reason for reversal or store/forward message.

The following is the addendum covering different scenarios for mobile remittance and appropriate Response codes supported for successful as well as declined transactions in addition to the existing response codes referred in the NPCI Host-to-Host specification document.

**Table 18: Table of Response Codes**

Code	Description	Action	Description
00	Remittance successful. Applicable only if the processing code in 200 is 45	A	Remittance transaction is successful
00	Original transfer successful. Applicable only if the processing code in 200 is 32	A	Verification transaction is successful and remittance transaction for which verification was raised is successful
M0	Verification successful but original credit transaction declined	D	If the verification request is successful but the original transaction for which verification was raised had declined due to some reason
M1	Invalid Beneficiary Mobile Number/MMID	D	If the mobile number/MMID combination entered by the customer is not registered or is mismatch
M2	Amount limit Exceeded	D	Daily allowed amount limit for the customer is exceeded.
M3	Account blocked/Frozen	D	Beneficiary account is frozen
M4	NRE Account	D	Beneficiary account is NRE account
M5	Account closed	D	Beneficiary account is closed



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M6	Limit exceeded for member bank	D	When the limit set for the member bank as per Settlement guarantee fund has been exceeded
M7			
M8			
M9			

### 10.3.10 DE-41 Card Acceptor Terminal Identification

Format: Fixed Length

Type: an8

Description: A unique code identifying the terminal at the card acceptor location. Special characters (including national character support characters) are not allowed since some networks and/or back-office systems may have problems accepting these characters. The data element is mandatory for 01xx, 02xx, and 04xx request messages.

The first 3 digits of the terminal ID should be institution name

Field Edits: If present, it should be echoed in response and all subsequent messages.

1-3 – <Bank Code> For example, for SBI transactions the code can be 'SBI', for ICICI transactions the code can be 'ICI'

4-8 – Last 5 digit of mobile number 'NNNNN'

This can also be populated with the merchant ID for merchant payment transactions.

### 10.3.11 DE-42 Card Acceptor Identification Code

Format: Fixed Length

Type: an15

Description: Identifies the card acceptor in a transaction if the card acceptor is different from the acquiring institution. Special characters (including national character support characters) are not allowed since some networks or back-office systems may have problems accepting these characters. The data element is mandatory for 02xx request messages.

The first 3 digits of the terminal ID should be institution name.

Field Edits: If present, it should be echoed in response and all subsequent messages.

1-3 – <Bank Code> For eg for SBI transactions the code can be 'SBI', for ICICI transactions the code can be 'ICI'

4-15 – Mobile Number as 'NNN\*\*\*\*NNN' the remaining bytes can be filled in with spaces

This can also be populated with the merchant ID for merchant payment transactions.

### 10.3.12 DE-43 Card Acceptor Name/Location

Format: Fixed Length



Type: an40

Description: The name and location of the card acceptor, which defines the point of service in both local and interchange environments. Special characters (including national character support characters) are not allowed since some networks or back-office systems may have problems accepting these characters. Data element consists of the sub-fields detailed in the table below. The data element is mandatory for 02xx 04xx request messages.

Field Edits: If present, it should be echoed in response and all subsequent messages.

1-25 <Bank Name>

26-38 – ‘MOB NNN\*\*\*\*NNN’

39-40 – ‘IN’

This can also be populated with the merchant address for merchant payment transactions.

### 10.3.13 DE-102 Account Identification 1

Format: LLVAR

Type: ans28

Description: A series of digits used to identify a customer account. It denotes the “From” account number involved in the transaction (e.g. the Debit account in withdrawal or transfer transaction). The account number in the Account Identification 1 field must be right justified with leading zeros.

Usage: In the Mobile based Fund transfer transactions, Remitter bank must send the “from account number” (The account number can be masked too as per bank’s policy) which is debited for the transfer amount.

Field Edits: If present, should be echoed in all subsequent messages.

Constraints: C: The data element is used in 02xx messages, whenever account information must be transferred.

### 10.3.14 DE-103 Account Identification 2

Format: LLVAR

Type: ans28

Description: A series of digits used to identify a customer account. It denotes the “to” account number involved in the transaction (e.g. the credit account in deposit or transfer transaction). The account number in the Account Identification 1 field must be right justified with leading zeros.

Usage: In the Mobile based Fund transfer transactions, Beneficiary bank must send the Beneficiary’s account number (The account number can be masked too as per bank’s policy) to which the amount was credited.

Field Edits: If present, should be echoed in all subsequent messages.

Constraints: C: The data element is used in 02xx messages, whenever account information must be transferred.



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## 10.3.15 DE-120 Reserved for Private Use

Format: LLLVAR

Type: an999

Description: These fields are Tag-based.

### 0200 Request will contain the following details for remittance transaction

TAG	Mandatory/optional	Length	VALUE
001 (Transaction Type)	M	2	45
002 (Product Indicator)	M	3	MOB
045 (Remitter's name)	M	7 (Max 20)	Shivaji
049(MMID)	M	3	Value
050 (Remitter's NBIN +mobile number)	M	17 (Max 20)	NBIN+00+1+10 digit mobile number

### 0210 response will contain the following details for remittance transaction

TAG	Mandatory/optional	Length	VALUE
001 (Transaction Type)	M	2	45
002 (Product Indicator)	M	3	MOB
045 (Remitter's name)	M	7 (Max 20)	Shivaji
046 (Beneficiary name)	M	5 (Max 20)	Akbar
050 (Remitter's NBIN +mobile number)	M	17 (Max 20)	NBIN+00+1+10 digit mobile number

### 0200 Request will contain the following details for verification transaction

TAG	Mandatory/optional	Length	VALUE
001 (Transaction Type)	M	2	32
002 (Product Indicator)	M	3	MOB
045 (Remitter's name)	M	7 (Max 20)	Shivaji
047 (Original Txn data)	M	80	Populate the following DE of org transaction. 12, 13
049(MMID)	M	3	Value
050 (Remitter's NBIN +mobile number)	M	17 (Max 20)	NBIN+00+1+10 digit mobile number

### 0210 response will contain the following details for verification transaction

TAG	Mandatory/optional	Length	VALUE
001 (Transaction Type)	M	2	32
002 (Product Indicator)	M	3	MOB
045 (Remitter's name)	M	7 (Max 20)	Shivaji
046 (Beneficiary name)	M	5 (Max 20)	Akbar
050 (Remitter's NBIN +mobile number)	M	17 (Max 20)	NBIN+00+1+10 digit



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			mobile number
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## 11 Transport Layer

A TCP/IP connection is required for transport mechanism

### 11.1 Backend

Transport protocol creates a virtual host-to-host connection for the data being transported. The two transport protocols widely used are User Datagram Protocol (UDP) and the Transmission Control Protocol (TCP). Use of TCP is advocated as the transport protocol for mobile payments.

It has been detailed in the document above that the transactions carried out are mostly financial transactions carrying sensitive data which should not be lost and remain un-recovered in the network. TCP is thus the default choice for the transport protocol as it is a reliable protocol as compared to the unreliable UDP. Data packets that are lost are resent in case of TCP. If a packet comprising of the users response message is lost or is out of order, TCP makes sure of correct data delivery to the other end. Even though UDP provides a higher throughput, it does not take corrective action in case of out of order packets or provides reliable transmission.

### 11.2 Customer – Bank/MPSP

To initiate (or receive) a mobile payment request an account holder sends data from his mobile device with the help of mobile payment application provided by his Bank/MPSP. The mobile technology provides various possibilities for transporting this data. A GSM mobile phone may send or receive information through the following possible channels – Short Message Service (SMS), Unstructured Supplementary Service Data (USSD) or General Packet Radio Service (GPRS). A CDMA mobile phone may also use SMS or EDGE to send or receive information.

## 12 Security

Messages exchanged in mobile payment transactions often contain confidential user data and are prone to security breaches. It, therefore, becomes important to address the various security challenges faced by mobile payments. There are two aspects to security in the m-payment system, security of mobile devices and security of network technologies. Security of mobile devices implies security from unauthorised use, which can be achieved by user authentication mechanisms (e.g. Personal Identification Number (PIN), Personal Unblocking Key (PUK) or passwords. This aspect however is out of the scope of this document. Security of network technologies primarily deals with a secure message exchanging system.

As per the general framework of any secure messaging system - confidentiality, integrity, non-repudiation and authentication will be guaranteed by the m-payment services. The transport layer security offered by GSM/CDMA networks sufficiently guarantees confidentiality (messages cannot be read by anyone else) and message integrity (assurance that the message has not been altered in transit). Authentication (identifies the author of the transaction) and non-repudiation (makes sure that any of the users in the system cannot later deny the message they sent) is guaranteed with the help of wireless public key infrastructure (WPKI) and digital certificates.

The section below describes the security issues at the backend and between the Customer – MPSP interface.



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E-mail: [mpfi@idrft.ac.in](mailto:mpfi@idrft.ac.in)

## 12.1 Backend

SSL /TCP are used for an encrypted channel from source to destination. SSL requires a digital certificate which will be verified by a Certifying Authority (public or private).

## 12.2 MPSP – Customer

The MPSP-Customer link is expected to conform to financial-grade security. Two-factor authentication will be used as per RBI guidelines. The recommended security mechanisms for different transport such as GPRS, USSD, SMS, etc. and the security of the business processes adopted by the MPSP are outside the scope of this document. They will be covered in a separate document.

## 13 Changes for Member Banks as Remitter and Beneficiary

### 13.1 Changes for Remitter Members

- a) Addition of new transaction in the interface to existing NFS Switch or develop new interface
- b) Changes in the current recon and settlement system to reconcile the interchange and switching fees for mobile remittance transactions.
- c) Verification request as a new transaction type and populate the data from the original request.

### 13.2 Changes for Beneficiary Members

- a) Addition of new transaction in the interface to existing NFS Switch
- b) Changes in the current recon and settlement system to reconcile the interchange and switching fees for mobile remittance transactions
- c) Verify the status of the original remittance transaction based on the values received in the verification request and respond appropriately

### 13.3 Changes in NPCI systems

- a) Addition of new transaction in existing NFS switch
- b) Changes in online dispute management system for new rules
- c) Changes in billing system for these new transaction types
- d) Changes to develop new reports and raw data files
- e) Changes in settlement process
  - i. Verification request to be considered in the settlement based on the response code and the extended status of the original transaction.
  - ii. If the status of original transaction is positive (i.e. value in DE 39 is “00”) then it will be settled as successful remittance using the transaction date and time in the verification request

## 14 Settlement and Reconciliation

### 14.1 Settlement and Recon

Following are the changes in the settlement and recon process,



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- 1) Raw data files to member banks
- 2) Activity reports to member banks
- 3) Separate report for verification transaction

## 14.2 Dispute Management Cycle

- 1) NPCI will also form an arbitration committee with nominated members of member banks to decide on member banks for Mobile remittance.
- 2) Dispute Cycle
  - a) Chargeback (Remitter initiated)
    - i. Optional proof to be submitted – Scanned copy of the customer dispute letter.

While raising a dispute the following information is mandatory

1. Beneficiary's mobile number with NBIN
  2. Remitter's mobile number with NBIN (DE-120/tag 50)
  3. Transaction ID
  4. Transaction date and time
  5. Amount
  6. RRN (DE-37)
- b) Representment (Beneficiary bank Initiated)
    - i. Document proof of visible scanned copy of the account statement of the customer.
- 3) This transaction cycle will have following timelines
    - a) Chargeback - Remitter bank needs to raise this within 120 days from the transaction date.
    - b) Representment – Within 10 days of the receipt of the chargeback, Beneficiary bank needs to represent.
  - 4) Separate additional report for only Mobile based transactions for Remitter and Beneficiary banks.
  - 5) Settlement cycle for all these transactions will be 23:00 to 23:00 for all days as per the current NFS settlement windows.
  - 6) These transactions are treated as SMS (Single Message System) so will settle each day after successfully processed irrespective of the merchant settlement on the device.

## 15 Glossary of Terms

**Account Holder:** A Customer or Beneficiary who owns a Bank Account Number and is a mobile phone subscriber.

**Bank Account:** A Bank provides accounts to its Customers for performing financial transactions. An account is any financial instrument by which the Customer can make or receive payments to/from other parties. It includes current and savings accounts, debit cards, etc.



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E-mail: [mpfi@idrft.ac.in](mailto:mpfi@idrft.ac.in)

**Finite State Machine:** A Finite State Machine (FSM) has *states*, *events*, and *actions*. An object remains in a state for some period of time. During this time it may perform some action continuously. The FSM makes a transition to another state only when an event occurs. The transition is expected to be instantaneous and is usually accompanied by some action.

**ISO 8583 versions:** There are three versions of ISO 8583 Standard for Financial Transaction Card Originated Messages - Interchange message specifications; namely, ISO 8583-1:1987, ISO 8583-2:1993 and ISO 8583-1:2003. The placement of fields in different versions of the standard varies; for example, the currency elements of the 1987 and 1993 versions are no longer used in the 2003 version, which holds currency as a sub-element of any financial amount element. Position one of the MTI specifies the versions of the ISO 8583 standard which is being used to transmit the message. We are using ISO 8583-1:1987 version for the purpose of this document therefore the corresponding MTI will be 0xxx.

**Message Type Indicator:** This is a 4 digit numeric field which classifies the high level function of the message. A Message Type Indicator includes the ISO 8583 version, the Message Class, the Message Function and the Message Origin.

**Mobile Payment Application:** An application installed on the client's handset which is used as an interface to communicate with the Mobile Payment Provider. The design of the Mobile Payment Application is out of the scope of this document.

**National Electronic Funds Transfer (NEFT):** system is a nation wide funds transfer system to facilitate transfer of funds from any bank branch to any other bank branch.

**Payment Transaction Request:** A request for payment originated either at the Customer or Beneficiary point which contains the amount to be paid to the Beneficiary.

**MPSP- Mobile Payment Providers** - refers to the Mobile Phone Service providers who offer their platform to banks to facilitate mobile remittances from their customers.

**Remitting Bank** - refers to a member bank that first debits the amount remitted to a requesting Customer's account and sends a remittance request to IMPS for routing to the beneficiary's Bank for credit to the account of the Beneficiary.

## 16 Related Documents

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[4] Act No. 10 of 1949 "The Banking Regulation Act, 1949", w.e.f 10<sup>th</sup> March 1949. Government of India.



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E-mail: [mpfi@idrbt.ac.in](mailto:mpfi@idrbt.ac.in)

[5] Reserve Bank of India, "Policy Guidelines for issuance and operation of Prepaid Payment Instruments in India", w.e.f 14<sup>th</sup> August 2009.

[6] S Bradner.(March 1997), "RFC 2119 Key words for use in RFCs to Indicate Requirement Levels".

[7] MPFI\_Interoperability\_Standards Document v1.10

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[9] Procedural guidelines Interbank Mobile Payment System

## 17 Contributors

This document was prepared by the Technology Committee of the Mobile Payment Forum of India (MPFI) with inputs from the MPFI Executive Committee and MPFI members.

### 17.1 MPFI Technology Committee

1. Mr. N. Jambunathan, SBI [Chairman]
2. Mr. Abhishek Poddar, ngpay
3. Dr. Mahil Carr, IDRBT
4. Mr. G Bharavi, mChek
5. Mr. G P Shekar, FSS [Former Chairman]
6. Mr. Kamlesh Dixit, Tata Tele Services
7. Ms. Rani Santhanam, ICICI Bank
8. Mr. Shane Deniz, MasterCard
9. Prof. Timothy A Gonsalves, TeNeT Group, IIT-Madras

### 17.2 Other Technical Contributors

1. Ms. Ramya R, Project Officer, TeNeT Group, Department of CSE, IIT-Madras
2. Mr. Praveen Chandrahas , Department of CSE, IIT-Madras
3. Dr. Gaurav Raina , Department of Computer Science & Engg, IIT-Madras