# UPI

## (UNIFIED PAYMENTS INTERFACE)

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# Content

- Introduction
- Who is Behind UPI
- How UPI works with NPCI
- Core elements in payment
- Architecture of UPI
- Virtual Payment Address
- Types of Payment request
- Advantages
- Applications
- Conclusion

# What is UPI?

- It is payment system launched by NPCI.

- Facilitates fund transfer between two bank accounts.

- Supports Peer to Peer connection.

- Advance version of IMPS.

- Supports seamless fund routing and merchant payments.

- Open source , easily adaptable , simple , cheap , mobile based , innovative.

# Who is behind UPI?

- NPCI (National Payments Corporation Of India).

- Umbrella organization for all retail payments system.

- Set up by RBI and IBA in April 2009.

- It launched the IMPS.

- It launched the RuPay card.

- Currently , launched UPI .
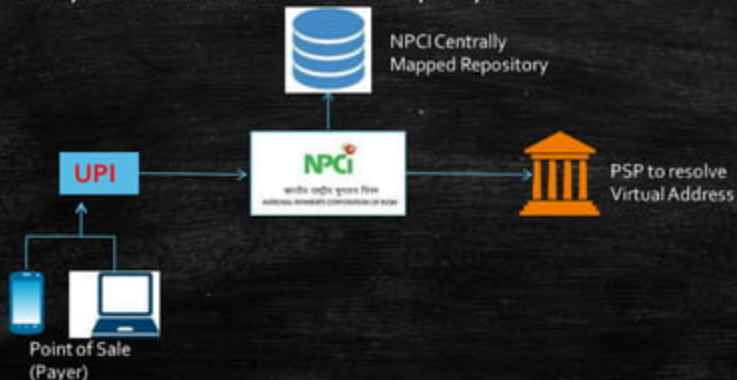
# How UPI works with NPCI?

- A NPCI repository is used.
- Repository stores credentials about payer and payee.
- Route payments instructions (Adhaar no. or Mobile no.).
- Do switching, clearing and settlement of transactions.

# How UPI works with NPCI?



Fig. 1- A NPCI's repository
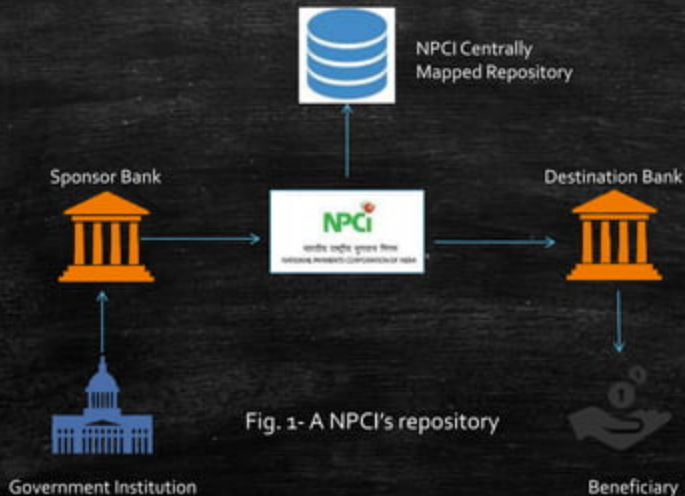
# How UPI works with NPCI?

- The Payer/Payee information is sent, **via PSP**, to NPCI.

- To identify the details of the second party involved, it either uses its repository or it contacts the second party PSP.

# How UPI works with NPCI?

- Once both PSPs` information is available to NPCI proceeds with the debit and credit processes.

- On successful completion the payer and payee PSPs are notified, which then notify their customers.
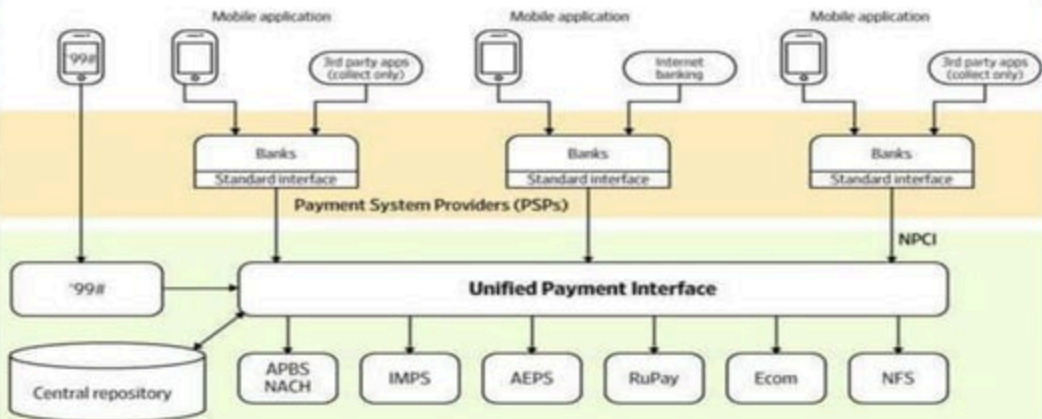
# Core Elements in Payment

- Payer and Payee account and institution details for routing transaction.

- Authentication credentials (password, PIN, biometrics, CVV, etc. as required for debit, can be bank provided or 3rd party provided such as UIDAI).

- Transaction amount.

- Timestamp.

- Other metadata attributes such as location, product code, mobile number, device details, etc. as required.

# Architecture of UPI



**THE ARCHITECTURE OF UPI**

Mobile application     Mobile application     Mobile application

*99#

3rd party apps (collect only)

Internet banking

3rd party apps (collect only)

Banks — Standard interface

Banks — Standard interface

Banks — Standard interface

**Payment System Providers (PSPs)**

NPCI

*99#

**Unified Payment Interface**

Central repository

APBS NACH    IMPS    AEPS    RuPay    Ecom    NFS

*99#: NPCI USSD service code to access banking service via phone

Source: NPCI

# Virtual Payment Address

- Has Unique mapping to Identifier (Person / Entity ).

- Contain Global Identifier ( Adhaar number and Mobile Number ).

- 1-click 2- factor authentication.

- Pay and Collect Money.

- PSPs can offer  multiple virtual address to customers.

- Rule based access.

# Virtual Payment Address

- Normalized Architecture for payment address "account @ provider".

- The address must include : 'a − z ', 'A − Z ', 'o − 9 ', '. (dot) ', '− (hyphen)' .

- The Payment Address can be issues by :

  Bank : amit.8868@icici , PSP : rahul2017.irctc@mypsp

- NPCI (using global identifiers )

- IFSC code and account number as account-no@ifsc-code.ifsc.npci

  e.g. 12345@HDFC0000001.ifsc.npci

# Virtual Payment Address

- - Adhaar number  as aadhaar-no@aadhaar.npci
    e.g. 234567890123@aadhaar.npci

- - Mobile Number as mobile-no@mobile.npci
    e.g. 9800011111@mobile.npci

- - RuPay card number as card-no@rupay.npci
    e.g. 1234123412341234@rupay.npci

# Types of payment request

- Direct Pay

- Sender Initiated
  Sender provides his credentials and receiver`s virtual address using his payment application.

  E.g. Sending money to relatives, friends, shopkeepers.

- System initiated
  Digitally signed request with receiver virtual address.

  E.g. System generated daily payment to agents.

# Direct Pay Transaction Flow
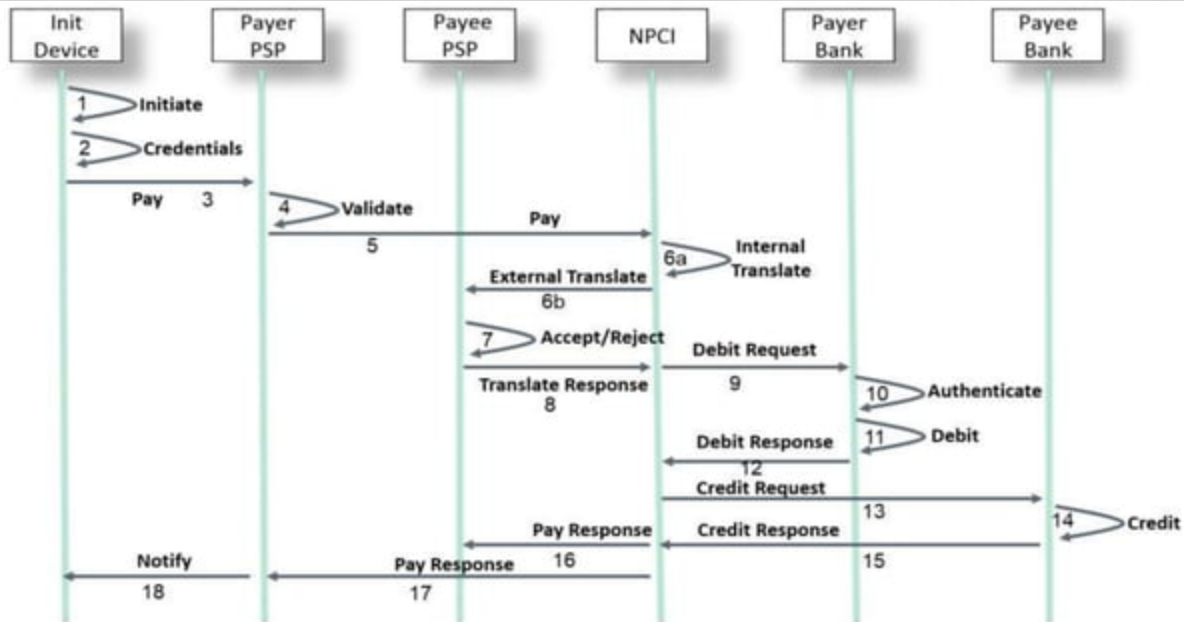
# Types of payment request

- Remote Collect
  Payee send the request to the payer (through USSD or Smartphone) on his phone.
  So the payee doesn`t have to enter any credential.
  # Local exchange of encrypted credential is not currently supported in UPI.
  The sender`s phone on the arrival of request become point of entry of secure credentials.


- Local Collect
  Here the payer`s address is captured to send the payment request.

# Collect Pay Transaction Flow
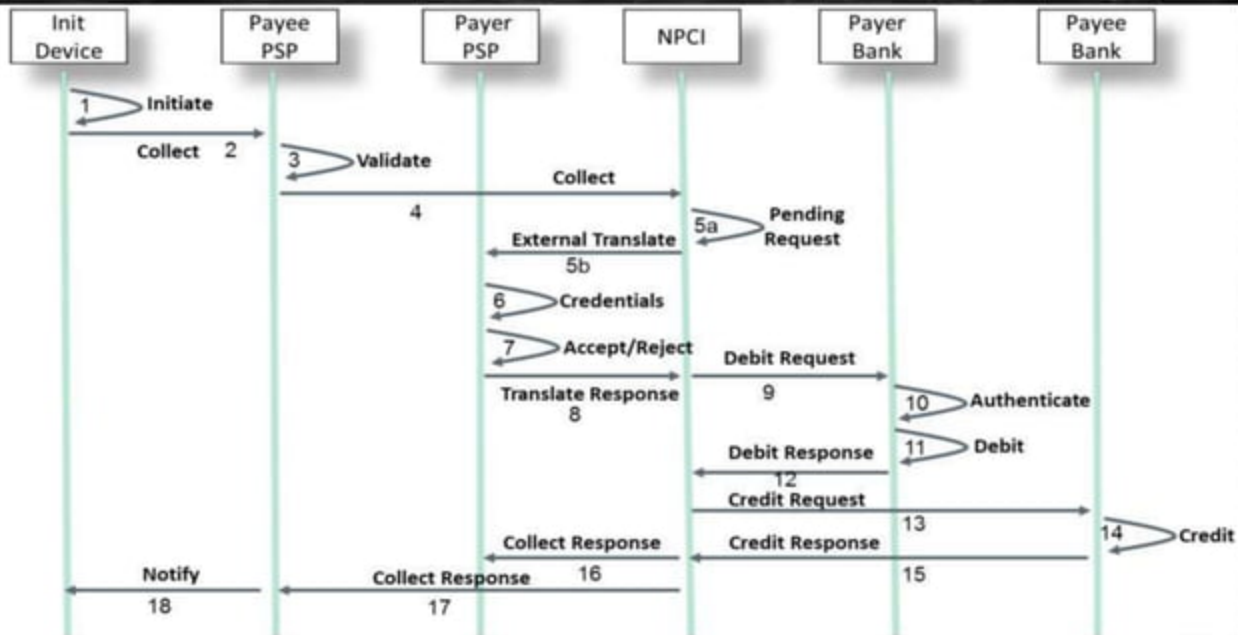
# Application



Sending Money on UPI

# Application

- Sending money to relative
- Collecting money from friend
- Buying on an ecommerce site
- Buying railway ticket on IRCTC application
- Using a taxi services

# Advantages

- Trusted common library for credentials (MPIN, PASSWORD, PIN BIOMETRIC ) is provided by NPCI.

- Credentials encoded with Base64 encoding and are provided only during the transaction by UPI.

- 2 factor authentication is used.

- Simple and cheap.

- Pay limit is greater than e-wallets.

- End user friendly.

# Conclusion

- UPI is growing at exponential rate , because it makes the digital payment a very easy affair. Also it is still in developing state which will inculcate new features in future.

- UPI 2.0 would be launched which has more flexibility , easy and wide reach. It is also very easy to adopt because it also reduces the black economy.

- In near future most of the payment will be happen digitally , to come over the restrictions of using plastic money , it may be a game changer. Also its unique features makes it a easy to adopt technology.

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Thank You !!!