

Key Choices in Mojaloop Implementations

Mojaloop Convening Arusha June 2019
Carol Coye Benson, Glenbrook Partners
Michael Richards, ModusBox



■ The Mojaloop Community Document Project

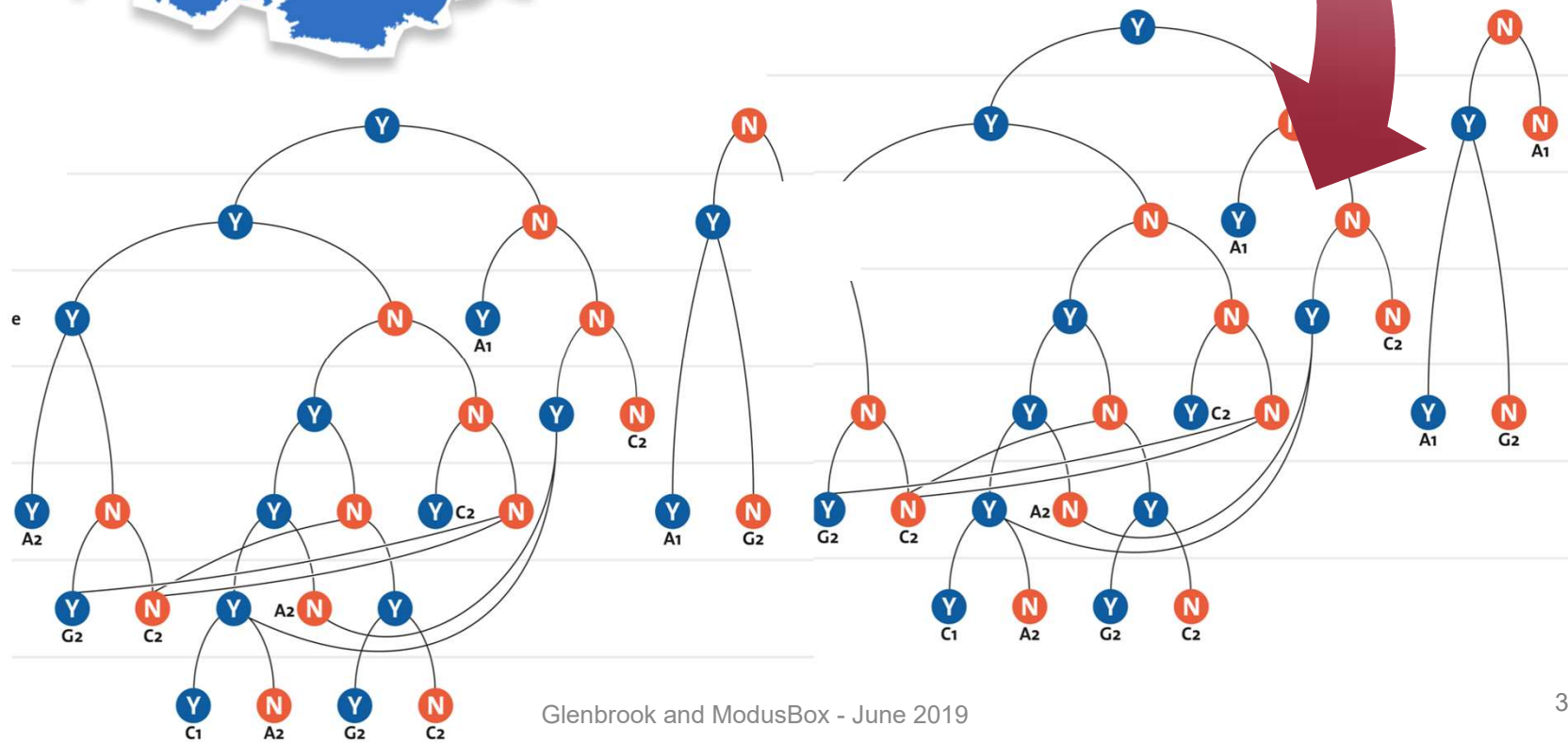
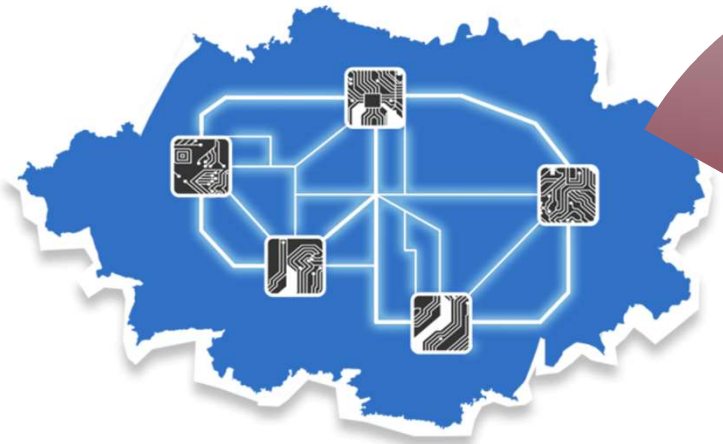
Goals

- Create a set of rules templates for rules for payments schemes following the Level One Design Principles
- Templates can work for many different schemes, but are designed to work in particular for schemes adopting Mojaloop
- Create a structure that will evolve along with the Mojaloop code
- Try to influence the use of rules that drive scale
- Try to anticipate the need for eventual cross-system interoperability

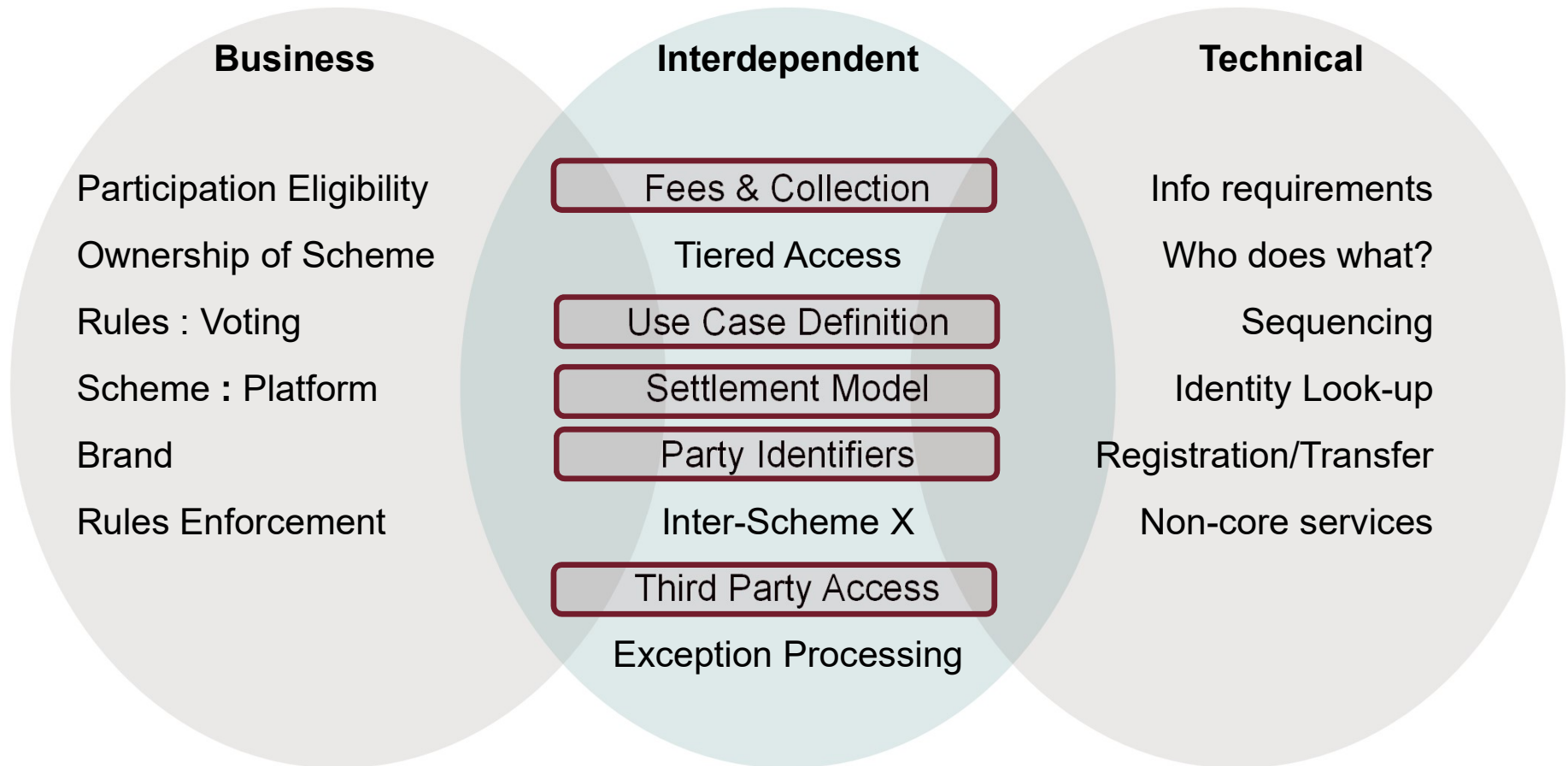


From Theory to Reality

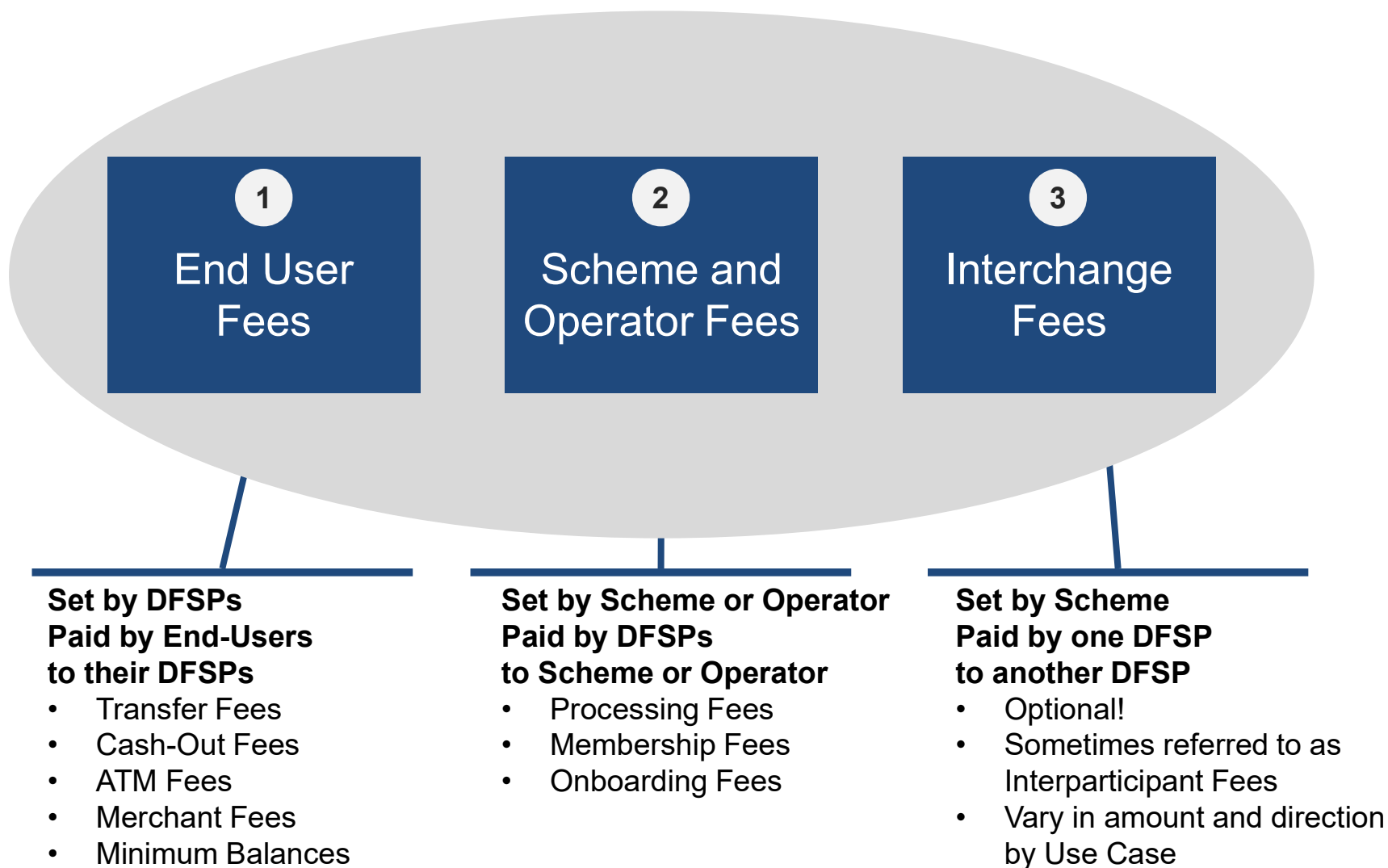
LOTS OF CHOICES!



INTERDEPENDENT BUSINESS AND TECHNICAL CHOICES



Three Kinds of Fees in Any Open-Loop Payment System



Fees

Business Questions		Technical Questions
Scheme requires or enables communication of end-user fees from one DFSP to the other?	1	Which API calls are used?
Scheme control over end-user fees? What/how?	1	When are controls applied? What should happen if a problem occurs?
Is there interchange? How much? Why?	2	Is interchange collected in-transaction or outside (monthly)? If in-transaction, how?
What are the scheme/operator fees? Fixed or variable? Incentives for volume? Two sided or one sided?	3	How are scheme/operator fees collected?

L1P Principles

- Low cost/not for profit operation of scheme
- Transparency of fees to end-users

Use Case Definitions

What are use cases?

- Describe what a payment is being used for. "Who's doing what to whom – and how"

Why do they matter?

- Technical flows may vary
- Data requirements may vary
- Business rules may vary
 - Liability
 - Fees



A Starting Point

From the Open API Specifications Document

1. P2P Transfer
2. Agent-Initiated Cash In
3. Agent-Initiated Cash Out
4. Agent-Initiated Cash Out Authorized on POS
5. Customer-Initiated Cash Out
6. Customer-Initiated Merchant Payment
7. Merchant-Initiated Merchant Payment
8. Merchant-Initiated Merchant Payment Authorized on POS
9. ATM-Initiated Cash Out
10. Refund

Use Case Definitions

Business Questions		Technical Questions
How many use cases to define?	→	How are use cases recognized by the system? Labelling, or inference or both? If inference, what are the rules? If labelling, how are labels created and validated?
Are use cases defined by categories of DFSPs?	→	How to recognize different categories of DFSPs
How to manage different fee scenarios; for some schemes this runs into hundreds of different use cases	→	What are the types of fee that can be defined, and how are they to be managed? How do we define and recognise a “use case”? Are fees keyed to any trigger except transfers (for instance, directory enquiries?) If so, how is this to be managed?

L1P Principles

- Support of multiple use cases to drive usability, lower cost

■ Settlement Model

Business Questions
Who settles – directly or indirectly?
How much liquidity risk is the system prepared to bear?
How is liquidity risk managed? Prefunded or collateralized? How are adjustments to liquidity positions done?
Multilateral vs. bilateral?

Technical Questions
Gross vs. net?
Pooled vs. separate settlement accounts?
What API calls are required?
How is the NDC calculated?

L1P Principles

- Same day settlement
- Low cost/low risk

Settlement Choices

	Multilateral Settlement		Bilateral Settlement
	Net	Gross	Net
Individual Participant Settlement Accounts @ Settlement Bank	Common for retail bank systems	Common for RTGS; being implemented in some RTRP systems	Common for non-scheme payments exchanges
A Pooled Participant Settlement Account @ Settlement Bank	N/A	New model; implemented in one major RTRP system	N/A

? Do non-bank DFSPs settle differently?

? Are hybrid approaches possible?

Party Identifiers






How are various parties identified to each other?

How are payments “addressed”

- In a push payment system, the Payer DFSP needs to include the Payee’s Identifier
- In a pull payment system, the Payee DFSP needs to include the Payer’s Identifier
- In new third-party enabled systems (such as India’s UPI and various EU systems) both Payee and Payer Identifiers are necessary

Party Identifiers: A Starting Point

From the Open API Specifications Document

Name		Description
MSISDN		An MSISDN (Mobile Station International Subscriber Directory Number; that is, a phone number) is used in reference to a Party. The MSISDN identifier should be in international format according to the ITU-T E.164 ³⁷ standard. Optionally, the MSISDN may be prefixed by a single plus sign, indicating the international prefix.
EMAIL		An email is used in reference to a Party. The format of the email should be according to the informational RFC 3696 ³⁸ .
PERSONAL_ID		A personal identifier is used in reference to a participant. Examples of personal identification are passport number, birth certificate number, and national registration number. The identifier number is added in the PartyIdentifier element. The personal identifier type is added in the PartySubIdOrType element.
BUSINESS		A specific Business (for example, an organization or a company) is used in reference to a participant. The BUSINESS identifier can be in any format. To make a transaction connected to a specific username or bill number in a Business, the PartySubIdOrType element should be used.
DEVICE		A specific device (for example, POS or ATM) ID connected to a specific business or organization is used in reference to a Party. For referencing a specific device under a specific business or organization, use the PartySubIdOrType element.
ACCOUNT_ID		A bank account number or FSP account ID should be used in reference to a participant. The ACCOUNT_ID identifier can be in any format, as formats can greatly differ depending on country and FSP.
IBAN		A bank account number or FSP account ID is used in reference to a participant. The IBAN identifier can consist of up to 34 alphanumeric characters and should be entered without whitespace.
ALIAS		An alias is used in reference to a participant. The alias should be created in the FSP as an alternative reference to an account owner. Another example of an alias is a username in the FSP system. The ALIAS identifier can be in any format. It is also possible to use the PartySubIdOrType element for identifying an account under an Alias defined by the PartyIdentifier .



Only these three identifiers contain the transaction account number; all others are forms of aliases, except that:

- A MSISDN is an account identifier for an MNO, but not for a bank...
- An account ID is an internal identifier for the DFSP: it is not guaranteed to be unique across a scheme, nor is there an independent way of verifying its correctness. Nevertheless, it does identify a transaction account...

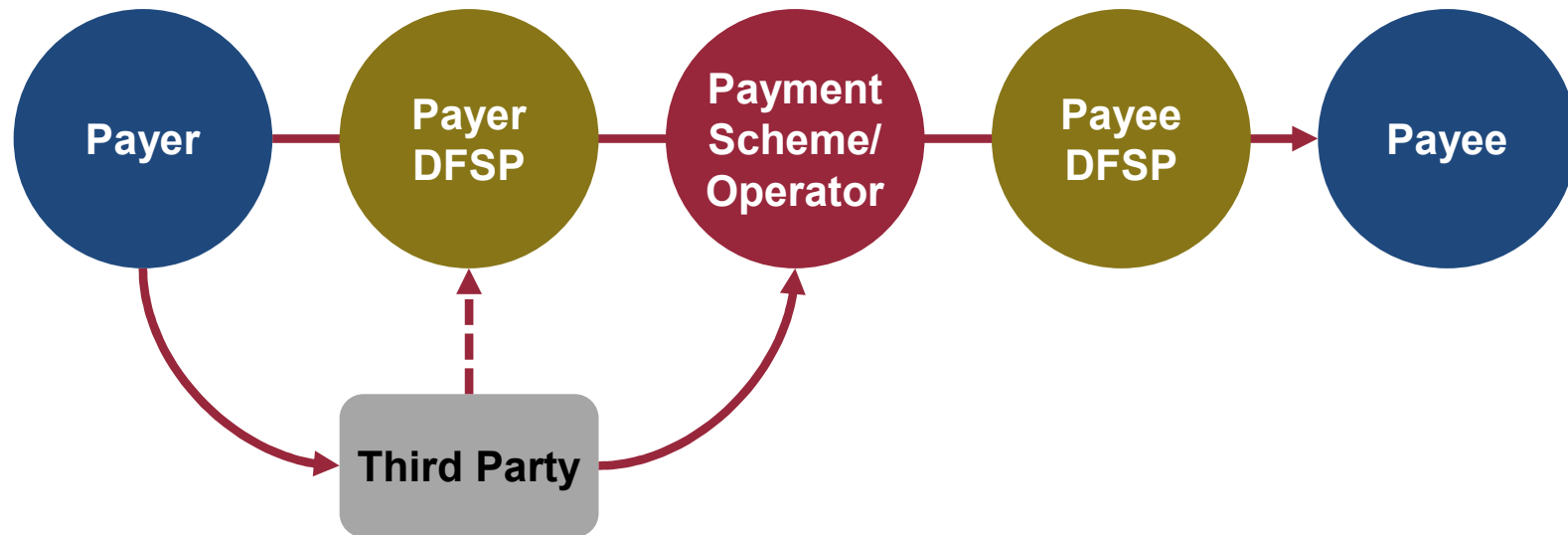
Party Identifiers

Business Questions		Technical Questions
Which ID types does a scheme support?	→	Are there existing ways of mapping each ID type onto a DFSP? If not, how is the mapping to be done?
For aliases, where does the mapping of the identifier to the account number occur? At the Payee DFSP or in a directory?	→	What are the registration protocols? Does the scheme need to confirm the validity of the mapping? If so, how?
Is there a persistent ID for parties across DFSPs?	→	If so, who maintains this and how?
Is ID portability a value/concern?	→	How might this work? How is a move requested? Who needs to confirm the move, and how?
How is uniqueness to be managed?	→	Should the scheme issue identifiers? If so, how are requests to be managed?

L1P Principles

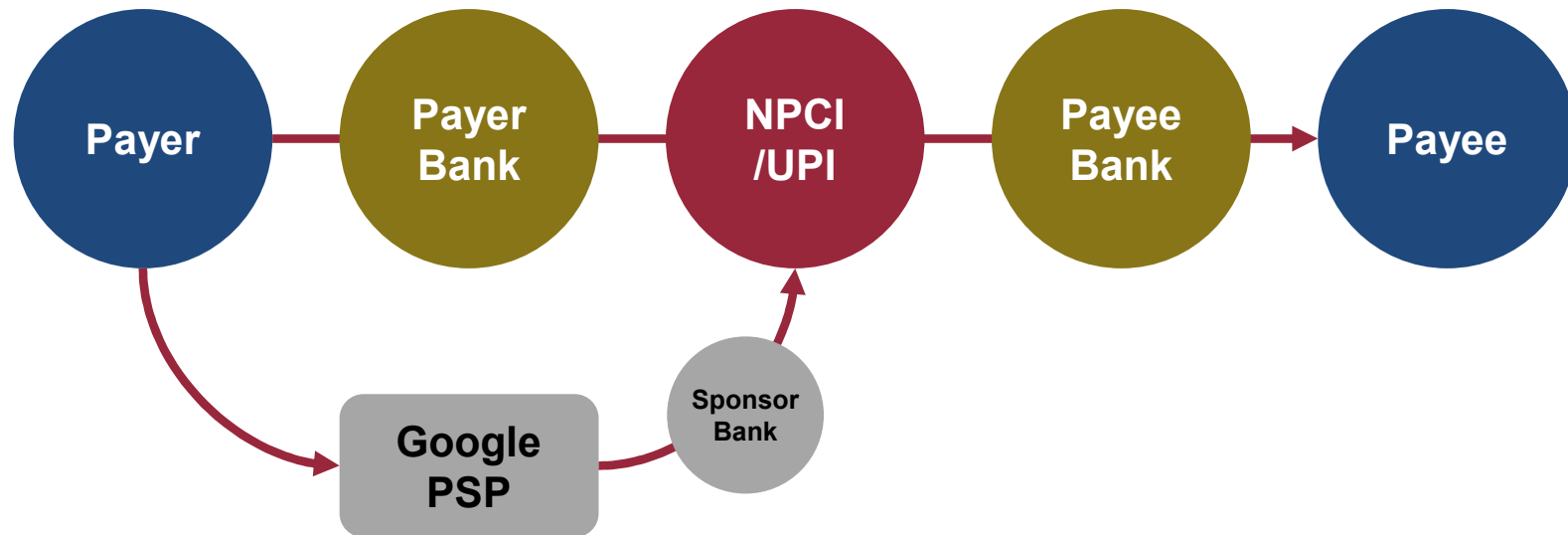
- Ease of access/ease of on-boarding
- Fraud control and regulatory visibility

Third Party Access: Traditional Approach



- Only transaction-account providing DFSPs are participants in a scheme.
- The conventional approach to third-party access is that a DFSP needs to sponsor them/be responsible for them as they access the scheme.
- They may connect to the operator directly, but the scheme obligations remain with the DFSP.
- If they have a relationship with an end-customer, (such as a closed loop wallet), they need to pass the financial transaction through their own account with a DFSP in order to effect a transaction to another DFSP.

Third Party Access: India UPI Approach



- Rules allow banks or registered non-banks to be “PSPs” and offer mobile UPI payments to customers
- PSPs must use UPI-supplied SDKs and Libraries in their UPI payment apps
- Rules and technology together allow the PSP to receive and execute a payment order; the PSP handles the first form factor of authentication (the phone) and the Payer Bank the second (the UPI PIN and confirming funds availability)
- The PSP is not a financial party to the transaction: neither is their Sponsor Bank, who has an overall responsibility for the good behavior of the PSP, and is involved in transaction routing.

Third Party Access

Business Questions

What kinds of third party access are permitted?

Are third parties always acting under the sponsorship of a DFSP? Is that DFSP financially responsible for the transaction?

Are separate rule sets required for different kinds of access?

Technical Questions

How are we to distinguish between different types of participant?

If third party transactions are booked to a sponsor, how are they to be distinguished from the sponsor's own transactions?

How are we to define and apply different rule sets to types of participant? Does this imply anything different about the types of rules we need to support?

L1P Principles

- Ease of access
- Low costs