

The background of the slide is a photograph of a person's hands using a payment terminal. The image is semi-transparent, allowing text and graphics to be overlaid. A logo consisting of two overlapping triangles, one yellow and one green, is positioned in the upper center. The text 'payments strategy forum' is written in white within a white-outlined rounded rectangle that overlaps the logo. Below the logo, the main title and date are displayed in white text.

payments
strategy
forum

New Payments Architecture
Vendor Advisory Group
19th May 2017

Agenda

#	Agenda item
1	Introduction
2	Overview of each work-stream
3	Terms of Reference
4	WS2: NPA Design & Transition
4.1	High-level New Payments Architecture (NPA)
4.2	NPA Use Cases
4.3	Discussion on Proof of Concept for the NPA
4.4	NPA WS2 Questions
5	WS3: Implementation Planning and detailed CBA
5.1	Vendors to advise on the following (<i>offline</i>): <ul style="list-style-type: none">• <i>Cost of New Payments Architecture</i>• <i>Cost of 3 End User Needs solutions</i>• <i>Cost estimates for counterfactual</i>
5.2	Implementation Planning – Assumptions
6	WS4: Commercial Approach and Economic Models
6.1	Competition Categories
6.2	Anticipated competition in the NPA
6.3	Questions to Vendors
7	Next Steps
Close	

Introduction

- ▶ Your participation is sought from the perspective of the industry expertise your collected experience can bring to bear on the work of the Forum.
- ▶ Please leave your organisational affiliation at the door. All input provided in this session should be given in the knowledge that it may end up in the public domain.
- ▶ If there are insights you would like to share but you would prefer to do so anonymously outside of the room please contact us via email.
- ▶ We acknowledge that vendor organisations have different and valuable perspectives on the work the Forum is undertaking and can provide additional insights we need to consider.
- ▶ We would ask that you participate in this session in the spirit of collaboration to help us all build a better UK Payments ecosystem that will enhance competition and facilitate better consumer outcomes than at present.
- ▶ Your delivery experience of large scale critical systems delivery is welcomed and again your insights would be appreciated.

Terms of Reference

- ▶ Members of this Group should adhere to the Design Hub and NPA Vendor Advisory Group Terms of Reference.
- ▶ Members of the Vendor Advisory Group are expected to contribute in their capacity as individuals, and not promote or present the views of the organisations they work for or own.
 - ▶ Members who are not participating impartially will be removed by the Hub co-chairs if they are seen to be acting on behalf of their organisations.
 - ▶ Any member, or organisation they work for, will not be precluded from involvement in any future procurement process that relies on the work of the Forum.
- ▶ This Group does not constitute all payment vendors and is open to any additional vendors who wish to join.
- ▶ The NPA Vendor Advisory Group is expected to:
 - ▶ Provide input on emerging artefacts produced by workstreams 2, 3 and 4 for content enhancement,
 - ▶ Improve confidence levels on the core elements of the NPA design by providing Vendor subject matter expertise.

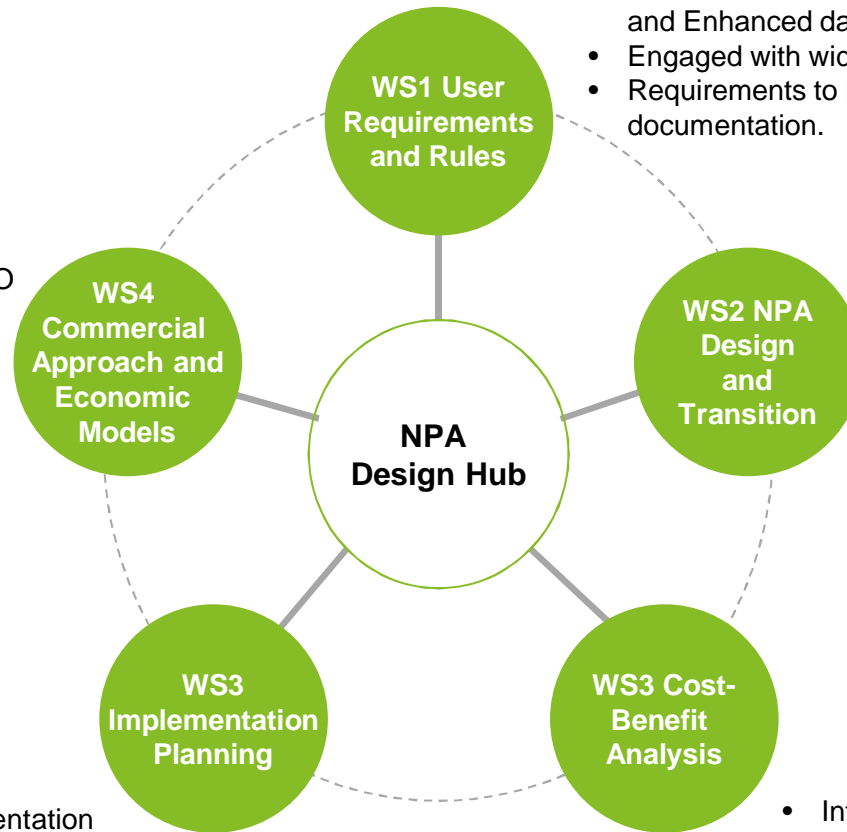
Collaboration



“The act by which people come together, regardless of location to work towards a common goal”

Generating value by leveraging the collective knowledge of the payments industry

Status of each workstream



- End user needs for the Request To Pay, Assurance Data and Enhanced data have been captured.
- Engaged with wide range of end user stakeholders.
- Requirements to be published with consultation documentation.

- Architecture team formed from PSO and PSP volunteers plus a dedicated team of architects to document the outputs.
- Settlement Model being discussed with Bank Of England.
- Architectural model agreed and will be presented in this session for your feedback.
- We require your assistance and feedback on the feasibility of the architecture to be discussed in the next session.

- Interviewed wide sample of the payments community.
- Built a CBA model.
- Finalising the first draft report within the Workstream team.
- We would like input on key assumptions and especially on costs for the NPA from this Group.

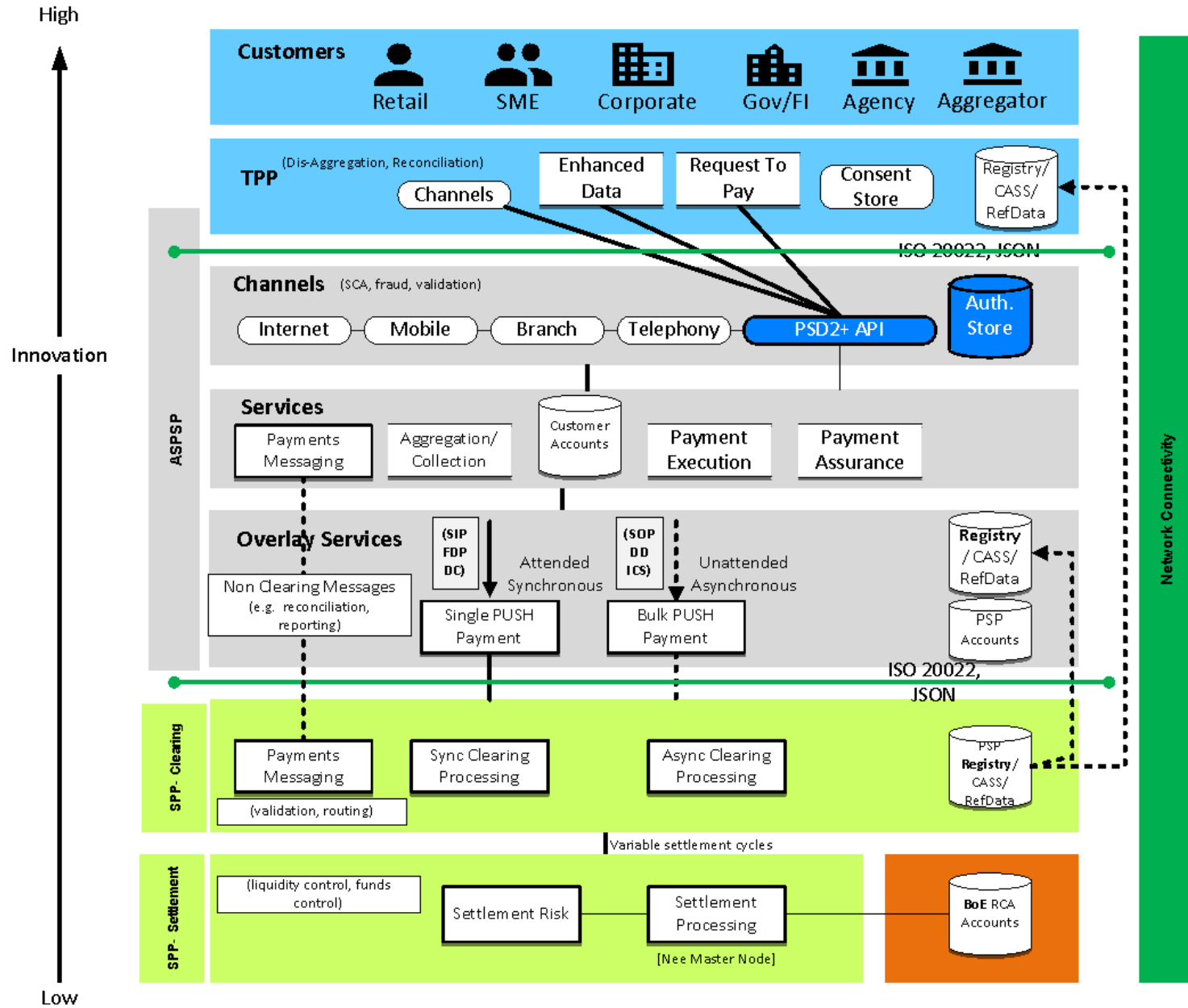
- Built a Payments Industry implementation Landscape to understand when any NPA build and roll out might be scheduled.
- Finalising key planning assumptions.
- Next step is to build a draft implementation plan.
- Require your feedback on the planning assumptions and input on how to progress planning.

- Developing the funding models that the NPSO might use to fund the building of the NPA elements.
- Clarifying the role of competition in the architectures.
- Draft funding and economic models being discussed and finalised.
- We would like your feedback



Section 4: WS2 NPA Design & Transition

NPA High Level Architecture



NPA High Level Architecture – Layers

Name	Description
Customer Layer	<p>The full range of PSUs will be supported, their key use cases will be used to drive the design.</p> <ul style="list-style-type: none">- Retail. (Instant Payments, DD/SO management)- Commercial. (High value, Bulk)- Corporate. (Direct Access, Salary, DD Mandates)- Government. (BACS grade 3)- Agency (Messaging)- Aggregator (access RCA, access to Sponsor)
TPP Layer	<p>Created under PSD2, TPPs will provide alternative channels and innovative payments, for multiple ASPSPs</p> <ul style="list-style-type: none">- Hold the consent for payments and execute against ASPSP following authorisation- Can implement Request To Pay, using PSD2 APIs- Can provide Channel alternatives and Aggregation and disbursement solutions- ASPSPs can behave as TPPs.
ASPSP Channels	<p>Channels that are directly provided by ASPSPs including APIs required to support PSD2 Open Banking with NPSO extensions to support PULL payments, Overlay specific TRA and variable amounts.</p>
ASPSP Overlay Services	<p>Are approved by the NPSO and implemented on top of PUSH mechanisms (Single Push Payments and Bulk Push Payments). Can be used to emulate existing scheme messages (e.g. FPS, SIPs)</p>
ASPSP Services	<p>Services that are required to execute and process the Payment against the customer account e.g. Debit the customer.</p>
SPP-Clearing	<p>Provides coordination for PSP to PSP payments messaging</p> <ul style="list-style-type: none">- Registry records valid PSP participants and roles managed by the FCA/NPSO, with SLAs- Assures validation and correct routing- Separates payments and associated messaging- Real time attended payments will be credited immediately to customer accounts- Unattended and bulk payments will be acknowledged, Refunds process will be available
SPP-Settlement	<p>Single point of settlement control for all payment instructions</p> <ul style="list-style-type: none">- Flexible settlement cycles supported by overlay type, to manage settlement risk

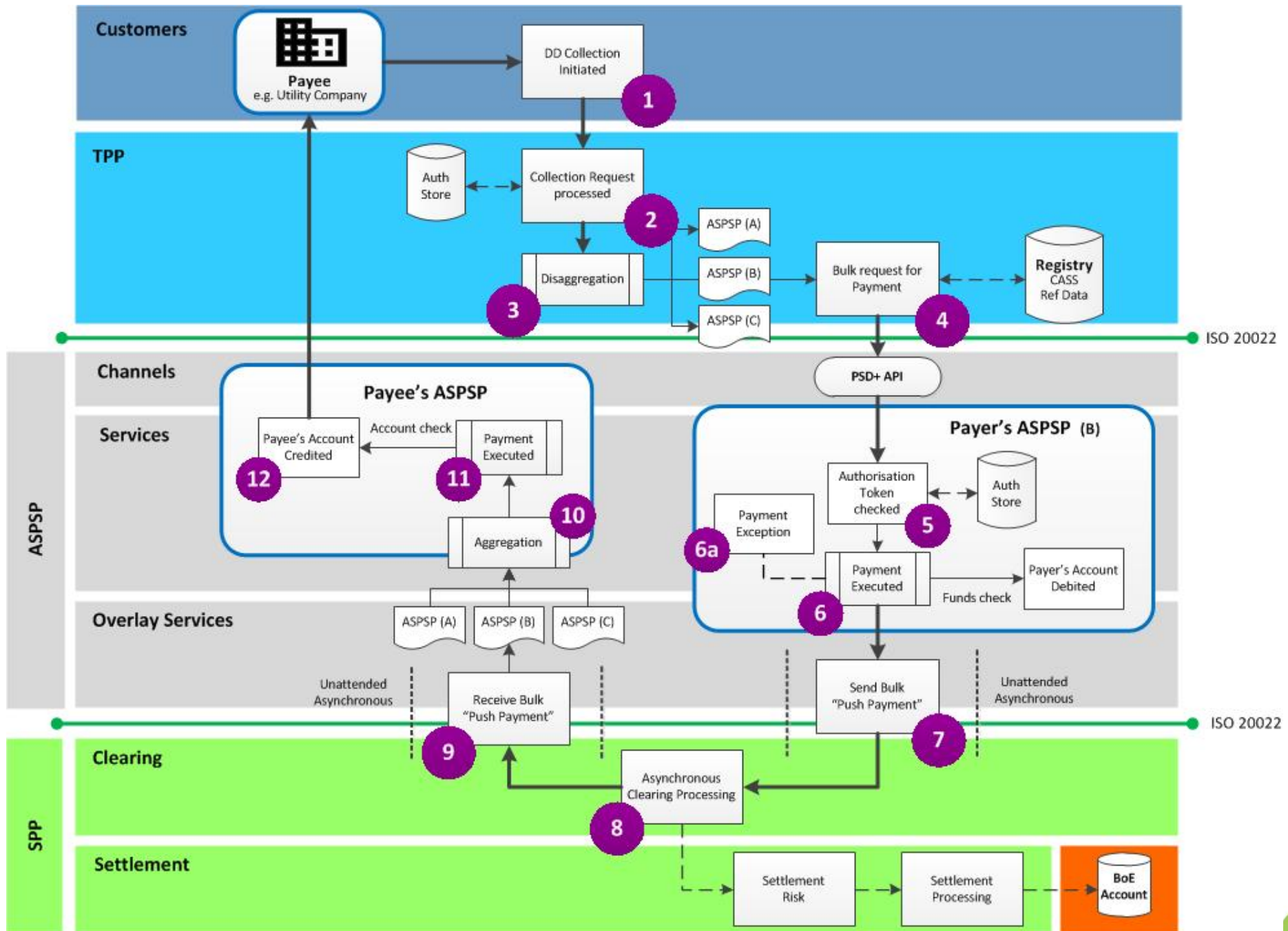
NPA High Level Architecture Components (1/2)

Component Name	Description
Competition for and In the market	The solution will enable competition for each layer and component, PSR/PSF will determine risk criteria and recommend final solution.
TPP Channels	Channels provided by TPPs to their customers in order to access TPP services.
TPP Consent Store	Repository of PSD2 customer consent
Request to pay	Provide customers with the minimum following options: (1) Pay all, (2) Pay partial, (3) Pay extension, (4) Decline and (5) Contact Us. - Interfaces with the NPA through the PSD2 framework.
Enhanced Data	Support for data content which can be captured by channels or APIs - ISO20022 supports additional data content (including images, cloud data storage references) - Payment messaging is enhanced for optimised business processing
Registry	Provides reference data (Sort Code/Bank/Overlay level (EISCD) reference data, CASS account transfers and customer reference data, PSP and TPP endpoints, roles and certificates) - Managed by the NPSO - Data pushed to participants (TPP, ASPSP) attended channels, unattended channels within SLAs
PSD2+ API	NPA builds on the PSD2/Open Banking APIs and security models. - ASPSP manage customer authentication and authorisation - PSD2 will need extension to support specific use cases (variable amount, TRA, PULL Payments)
ISO 20022	Message content will be based on ISO types - NPA will support JSON syntax for API communications - 4/5AMLD will require that data is not truncated, and available end to end

NPA High Level Architecture Components (2/2)

Component Name	Description
Payment Messaging	Advices, Research and Adjustments and reporting
Aggregation / Collection	Aggregation and collection of funds to the customer accounts
Payment Execution	Processing of the payment at the payee or the payer ASPSP account and managing the Overlay Service processing
Payment Assurance	<ul style="list-style-type: none">- Confirms Payee Identity- Provides Payment Status- Confirms Payer Identity
Attended Single Push Payment	<p>Routes and manages attended synchronous payment instructions between participants</p> <ul style="list-style-type: none">- Ensures that instructions finality rules are followed- Supports multiple overlay payment types, whilst maintaining resilience and safety
Unattended Bulk Push Payment	<p>Routes and manages unattended asynchronous bulk payment instructions between participants</p> <ul style="list-style-type: none">- Ensures that instructions finality rules are followed- Supports multiple overlay payment types, whilst maintaining resilience and safety
Network Connectivity	The network is in the competitive space and can be provided by competing providers that comply with the technical standards and rules set by the NPSO.
Settlement Processing	<p>Ensures BOE instruction finality rules are followed and interfacing to BOE RCA accounts</p> <ul style="list-style-type: none">- Supplies only the required information for bank to bank transfers

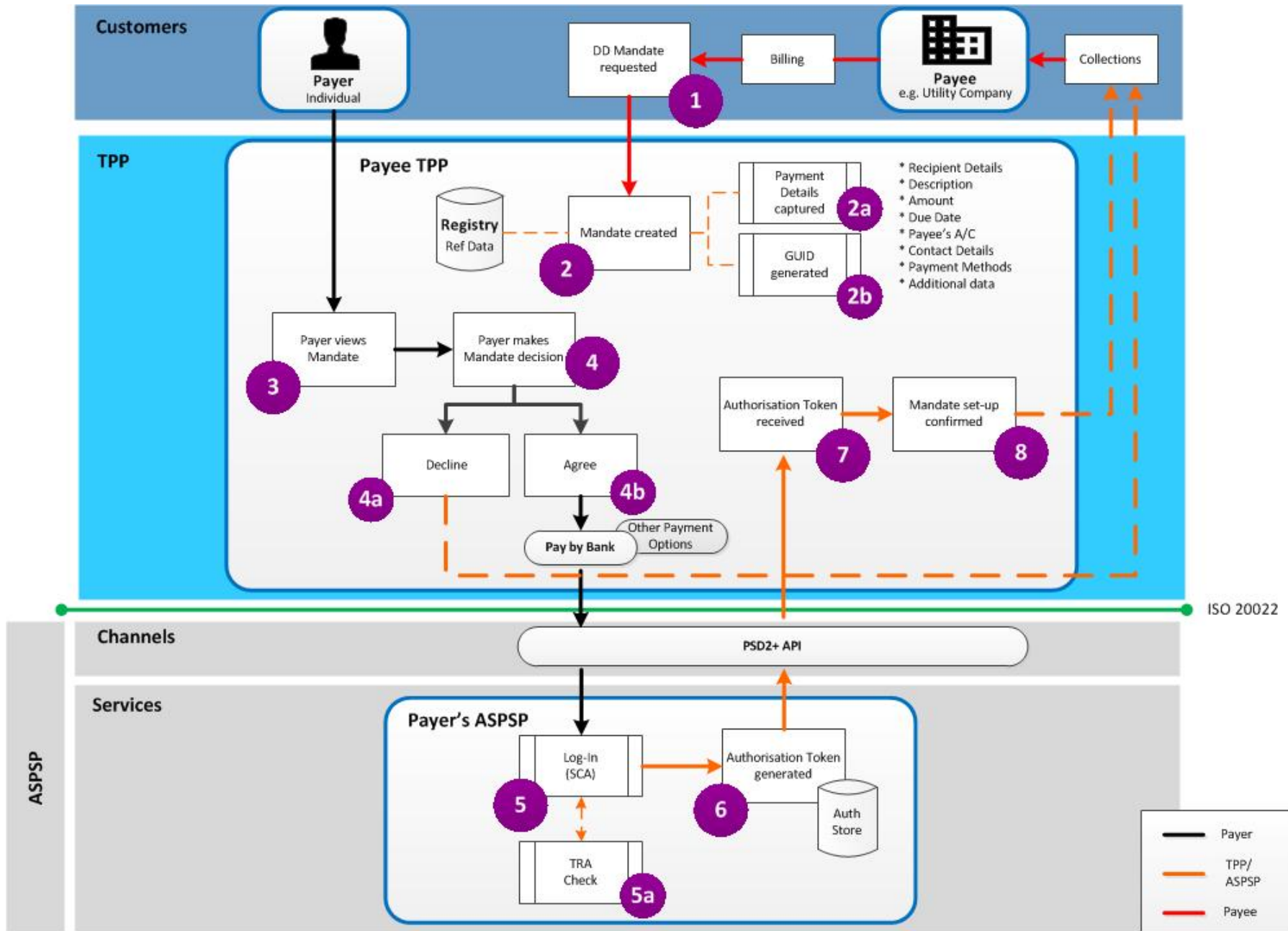
How NPA will support a Direct Debit payment (1/2)



How NPA will support a Direct Debit payment (2/2)

1. The Payee creates a bulk Direct Debit file containing each of the Payer's payment details i.e. amount to be paid on the due date
2. The Direct Debit file is sent to the Payee's TPP. The TPP validates the file against the authorised Mandates held for each of the Payee's customers (held in the TPP Auth Store)
3. The TPP disaggregates the Direct Debit file into separate files intended for the Payer's Account Servicing Payment Services Provider (ASPSP). The Direct Debit file is validated against reference data held in the Registry e.g. sort code redirection
4. Each ASPSP receives the Direct Debit file from the Payee's TPP via a PSD2 compliant API
5. The Payer's ASPSP checks a valid Mandate authorisation exists for each of the customer accounts (held in the ASPSP Auth Store)
6. The Payer's ASPSP executes the Direct Debit payment
 - The system checks the account status e.g. funds available
 - The customer's account is debited
 - Where the account status is unable to apply the Direct Debit payment, a Payment Exception message is generated and returned to the Payee
7. The Payer's ASPSP sends cleared Direct Debit payment details to the Clearing and Settlement Service via the Bulk "Push" payment model.
8. The Clearing and Settlement Risk Management checks the ASPSP's risk position and creates a settlement obligation. The Clearing and Settlement Service initiates settlement with the Bank of England (BoE)
9. The Clearing and Settlement Services sends the cleared Settlement Payment details from each of the Payer's ASPSPs to the Payee's ASPSP
10. The Payee's ASPSP aggregates each of the Payer ASPSP cleared Settlement Payment files into a single Payee account
11. The Payee's ASPSP executes the Direct Debit payment
 - The system checks the account status
12. The Payee's ASPSP credits the Payee's account on the due date

How NPA will support a Mandate Management (1/2)



How NPA will support a Mandate Management (2/2)

1. As part of the onboarding process, the individual customer (Payer) agrees to pay the utility company (Payee) via Direct Debit. The Payee initiates a Mandate request for each of its customers
2. The Payee will have a prior contractual agreement with a Third Party Provider (TPP) acting as a Payment Initiation Service Provider (PISP). The TPP will be responsible for managing Direct Debit mandates, including the set-up, amendment and cancellation on behalf of the Payer's customers. The Payee sends a Mandate request to their designated TPP. Reference data stored in the Registry ensures that the TPP is registered with the New Payment System Operator (NPSO) and also ensures that the TPP has permission to manage Direct Debit mandates
 - 2a. The Payee TPP initiates a Mandate instruction, capturing payment details:
 - 2b. A Globally Unique ID (GUID) is generated by the TPP for each Mandate request
3. The Payee TPP will make the Mandate instruction available to the Payee's customers via the Payee's preferred communication channel e.g. mobile app or corporate website. The Payee TPP informs the Payer that a Mandate request is available for authorisation. The Payer views the Mandate via the Payee's preferred communication channel
4. The Payer makes the Mandate decision
 - 4a. The Payer has the option to decline the Mandate request. The Payee TPP sends confirmation to the Payee that the Mandate request has been declined by the Payee's customer
 - 4b. The Payer has the option to accept the Mandate request. The Payer will be required to authorise the subsequent payment via their ASPSP. The Payee's preferred communication channel will allow the Payer to select their payment method. In this scenario, a "Pay by Bank" option could be selected via a mobile app or corporate website. Note; other payment methods could be selected

The "Pay by Bank" option will redirect the Payer to their ASPSP via a PSD2 compliant API. Note: the redirection follows OAuth2 standards and the Payee will not have access or visibility to the Payer account information or security credentials
5. The Payer will access their account using PSD2 compliant Strong Customer Authentication (SCA). The Payer's ASPSP will also complete a Transaction Risk Assessment (TRA) (5a) and the outcome of the TRA will determine if the Mandate request can proceed
6. The Payer's ASPSP authorises the Mandate request and generates an Authorisation token
7. The Payee TPP receives the Authorisation token. The Authorisation token will be used to initiate subsequent Direct Debit collections
8. The Payee TPP sends confirmation to the Payee that the Mandate request has been approved by the Payee's customer

“A short and/or incomplete realisation of an idea to demonstrate its feasibility”

PoCs can bridge the gap between how the architecture is envisioned during requirements definition and how it is ultimately delivered to the customer.

Draft

Proof of Concepts – Approach (1/2)

- ∅ Identified and agree capabilities of the New Payment Architecture that require proving
- ∅ Obtain formal agreement on PoCs (including priority)
- ∅ Secure funding and agree delivery approach
- ∅ Where appropriate document high-level requirements that enable design and build of prototypes
 - Assessment and high level requirements by June 2017
 - Detailed requirements Q3 2017

Note: Any Proof of Concepts are subject to a formalised decision process and will only be delivered on acceptance of the proposed approach with secured funding

Draft

Proof of Concepts – Approach (2/2)

#	Proof Point Requirement	Rationale	Required outcomes
1	Prove that a Single Payment Rail can support the proposed volumes and growth estimates.	FPS and BACS currently process payments on a separate platform therefore immediate payments are not impacted by the batch process for BACS which processes a significant volume of payments within a specified time window. The POC will demonstrate that the combined volumes can be pushed through a single payment rail and that 'Attended' payments are not impacted by 'Unattended' payments and performance SLA's & OLA's can be achieved.	Synchronous & Asynchronous payments are processed without impacting performance SLA's and OLA's. The message queue process for Asynchronous payments is capable of managing the throughput of payments.
2	Prove the performance of a Single Attended Payment Response to the Customer	Where a Customer instigates a payment and expects a response back the platform must do this within the agreed SLA.	A Synchronous payment response can be processed through the clearing platform and response message returned to the Customer channel within the agreed SLA.
3	Prove the performance and capability of the Registry DB to process defined volumes of data sets, and data.	The Registry will be required to hold and maintain data for a number of data sets, i.e. Customer Profile, Ref Data. The Registry must be performant and have the capability to process and return results within agreed SLA's.	Data calls to the registry are processed within agreed SLA's. The DB is capable of holding and maintaining the defined volumes
4	Prove the Replication performance of the Registry to distributed end points. (This may not be required if Caching is the design outcome)	Data Sets within the Registry will potentially be made available to participants,. This data will be required to replicated to the participant platform within agreed SLA's.	Data replication is able to meet the agreed SLA.
5	Distributed Settlement (Multi Node) - approach under review	The role of the SPP platform and interaction with the distribution Settlement Nodes.	Prove that the distributed settlement nodes can be updated and synchronised to agreed SLAs, that maintain a single Settlement position across all nodes.

Your views on PoCs

- What alternatives to Proof of Concepts should we consider?
- Any comments or questions about the potential list of PoCs ?
- Any PoCs that are missing off the initial list?
- When in the procurement cycle would the vendor community normally engage in developing PoCs?
- What do the vendor community need to be able to commence PoC work?

Questions for Vendors

- The NPA will adopt a layer approach where each layer will be able to function independently of the layers above or below. Does this concept raise any concerns, in particular the implementation of a consistent security model ?
- The NPA will deliver a Real Time Push Payment Model, does this pose any significant challenges ?
- The current payment volumes and future growth will be serviced through the NPA. There is a requirement to prove the systems capabilities to handle these volumes, is this something that you would be able to do in the short term ?
- The Registry will be a key component for the NPA and will potentially be required, or accessed in multiple layers. Data will potentially be managed by the NPSO but replication will be required real time to the distributed systems, does this raise any concerns ?
- Where you provide bureau services what do you believe will be the significant challenges for your customers ?
- The NPA proposed architecture is designed to promote innovation, where do see the potential for innovation ?



Section 5.1: WS3 Cost-Benefit Analysis

Introduction

The Cost Benefit Analysis (CBA) covers the underlying payment infrastructure (NPA) and the overlay services. These overlay services include Request to Pay, Assurance Data and Enhanced Data.

For the NPA, the CBA will include

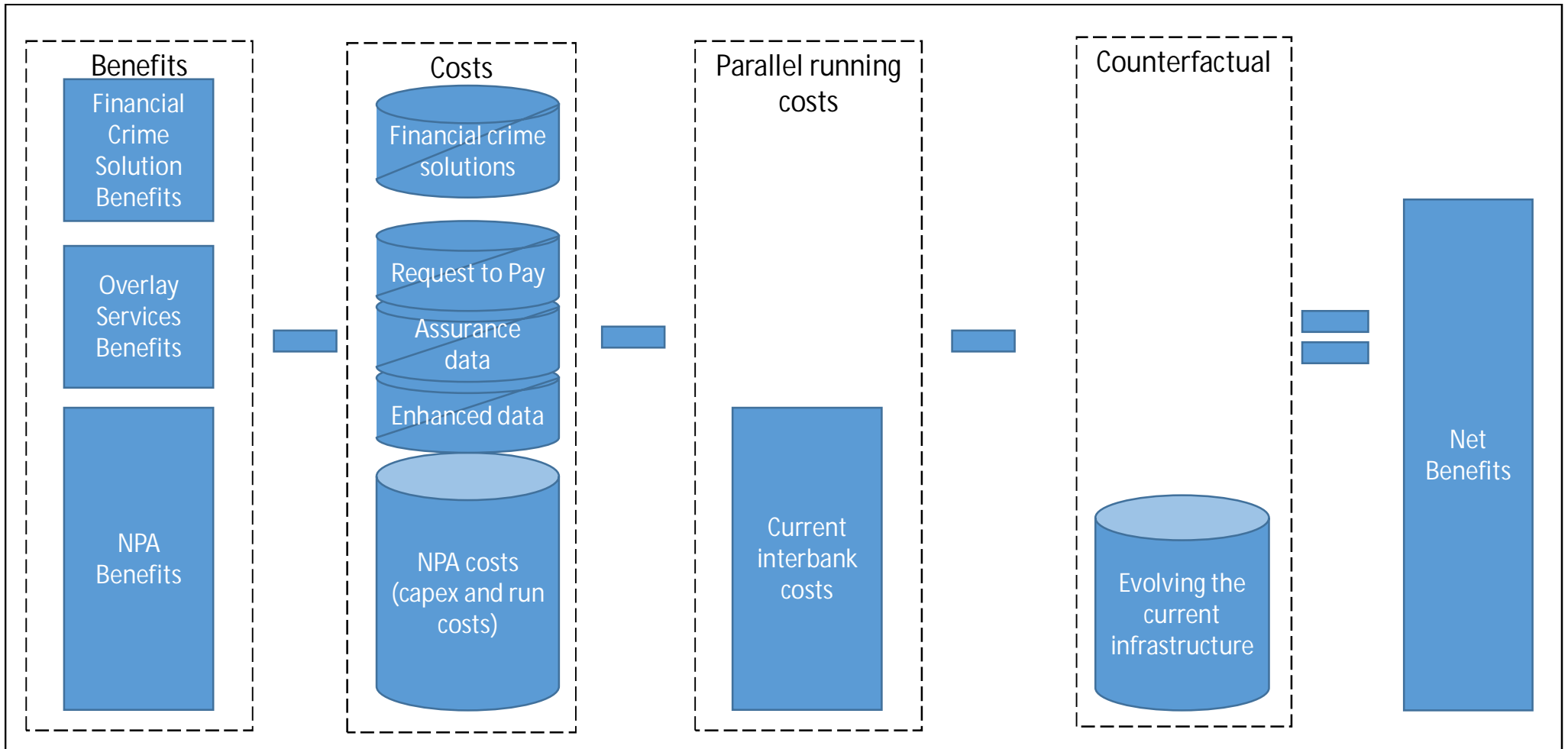
- Capital expenditure
- Operating expenditure
- Parallel running costs

In order to conform with HM Treasury guidance, the CBA will consider a do-minimum counterfactual scenario which we also assess as part of the CBA.

Assumptions are shared overleaf

NB: this assumption has yet to be validated by the PSF. No consensus yet on an NPA go-live date. Assumption can be changed as required.

Overview of CBA analysis



NPA Cost Assumptions

1 Capital Expenditure

- Ratio of central infrastructure capex to industry capex is estimated to be about 10% to 90% respectively. This is similar to what was experienced with FPS, CASS and ICS.
- Capability of real time payments, batch payments and cheques will be replicated in the NPA.
- Direct participants will have the ability to send and receive NPA transactions when NPA goes live.

2 Operating expenditure

- As with the current interbank payment systems, NPA will have annual run costs to support and maintain the system.
- Subject to adjustments for efficiencies (to be estimated), the current systems' run costs can be used as a proxy for the run costs of the NPA.

3 Parallel running expenditure

- The volume of transactions will remain constant across the two payment systems.
- Each participant in the payment system will have fixed and variable cost elements.
- Fixed costs will be wholly incurred in both systems (i.e. duplicated) as they run parallel to each other irrespective of payment transaction volumes.
- The direct PSP participants will take a phased approach to transition and run both systems in parallel whilst the indirect PSP participants will take a different approach and not run both systems concurrently.
- FPS can (saying it will) be transitioned within 2 years and BACS may need a longer timeframe

4

Counterfactual scenario

- The counterfactual to be adopted will involve upgrading the core infrastructure with an ISO 20022 enabled central system making the two existing schemes – BACS and FPS ISO 20022 compliant.
- As observed in previous payments infrastructure initiatives such as FPS, CASS and ICS, the ratio of central capital expenditure to costs outside the centre is estimated to be 10% and 90% respectively.
- The costs to run the counterfactual will be similar in magnitude to the costs of running the NPA or the existing schemes with their current capabilities.
- Upgrading FPS and BACS to be ISO 20022 compliant would involve developing a new platform hence until all transactions are transitioned there will be parallel running implications and costs.
- Upgrade of the systems is assumed to commence in 2018 with a go live date of 2020.
- The total time required to fully develop the functionality is estimated to be 24 months.

Questions for Vendors

- How much do you think it will cost to build and implement the NPA as described (NPSO and PSPs)?
- How much will it cost to build and implement Request to Pay and Assurance data as described (central costs, PSP costs and end user costs)?
- How much will the Counterfactual cost (to upgrade FPS and BACS to make them ISO 20022 compliant and how much will it cost PSPs and Aggregators to plug in to the upgraded FPS and BACs)?



Section 5.2: WS3 Implementation planning

Planning Assumptions

A number of planning assumptions have been created.

By their nature, the assumptions reflect into the other workstreams. Accordingly, they have been shared and discussed, including with the Design Hub.

1

End users will have the same transaction capabilities as they do today or better

- End users comprise consumers, businesses and government.
- They will receive communications about any beneficial changes throughout the implementation.
- As a minimum they will be able to transact as they do today with any changes being due to enhancements such as more functionality & greater choice.

2

NPA implementation will mitigate any additional systemic risk

- NPA will supersede the existing Bacs, FPS and (when implemented) ICS infrastructures through a safe and sensible transition whilst maintaining the resilience and robustness of payment processing in the UK.
- CHAPS, Cards and LINK are out of scope.
- New or revised RTGS will be utilised for settlement.

3

Existing payment services functionality will continue or improve under NPSO oversight

- Existing services include (but are not limited to): mobile proxy look up service, account transfer services (current accounts and ISAs), bulk payment redirection, biller update service & EISCD.
- These will need to continue during and after transition to the NPA.
- Any services that are discontinued for BAU reasons will not need to be supported.

4

No 'big bang' approach to implementation

- Existing schemes, their services and systems will be maintained to run in parallel with the NPA for sufficient time to allow a phased migration - roll back (within the determined period) will provide migration flexibility.
- All users of the schemes will be able to migrate to NPA in phases to mitigate volume transition risk, allowing for a broad range of readiness timeframes.
- Where appropriate, new PSF derived overlay services will support the execution of payment instructions across existing payment types (e.g. Bacs, FPS, ICS & Cards) and NPA to enable early delivery of end user benefits.

5

Each payment scheme can be transitioned independently

- Bacs, FPS & ICS transition to NPA will be independent of each other and can run in parallel.
- Institutions will be able to send & receive payments via existing and/or NPA route during transition phase.
- Sunsetting of Bacs, FPS & ICS infrastructures will occur at pre-determined dates and can happen independently of each other.

6

NPSO will be responsible for governance, rules, standards & delivery

- PSPs/TPPs will require accreditation and sign off from the NPSO before they can use the NPA.
- Overlay services will be approved by the NPSO to ensure NPA interoperability.
- NPSO will mandate the sunsetting dates for legacy infrastructure.

7

PSPs/TPPs will manage end user interfaces & proposition competitively

- User interfaces and customer channels will remain in the competitive space.
- Individual institutions will be able to independently develop and tailor their own propositions unless there is a compelling end user benefit from rules specifying some elements of the user's experience (for consistency and ease of adoption).

8

A transition solution will be in place to support the sunset of legacy infrastructure

- Transition solution will alleviate the burden of having to immediately change formats enabling a phased adoption.
- Will still required a definitive end date to ensure transition solution can 'retire'.

9

Transition will be planned to provide continuity with minimal user impact

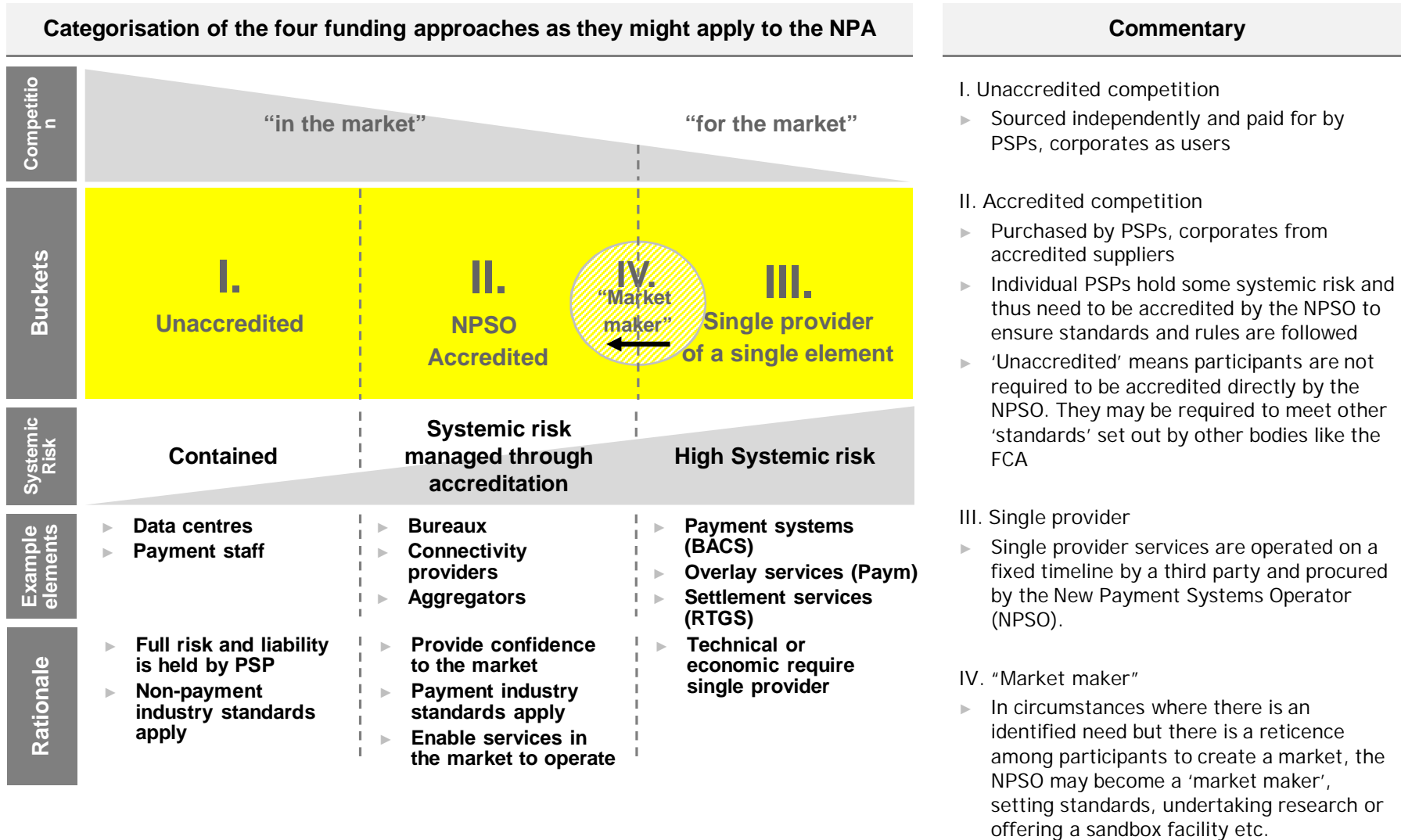
- Transition and migration will be carefully planned to ensure maximum availability.
- From a pre-determined date all ASPSPs will be required to receive NPA derived payments.
- All ASPSPs will be required to continue to receive the legacy payments that they currently receive until legacy infrastructures are sunset or switched through a transition solution.
- ASPSPs can make other account types (e.g. mortgage accounts) reachable at their own discretion.



***Section 6:
WS4 Commercial approach &
Economic models***

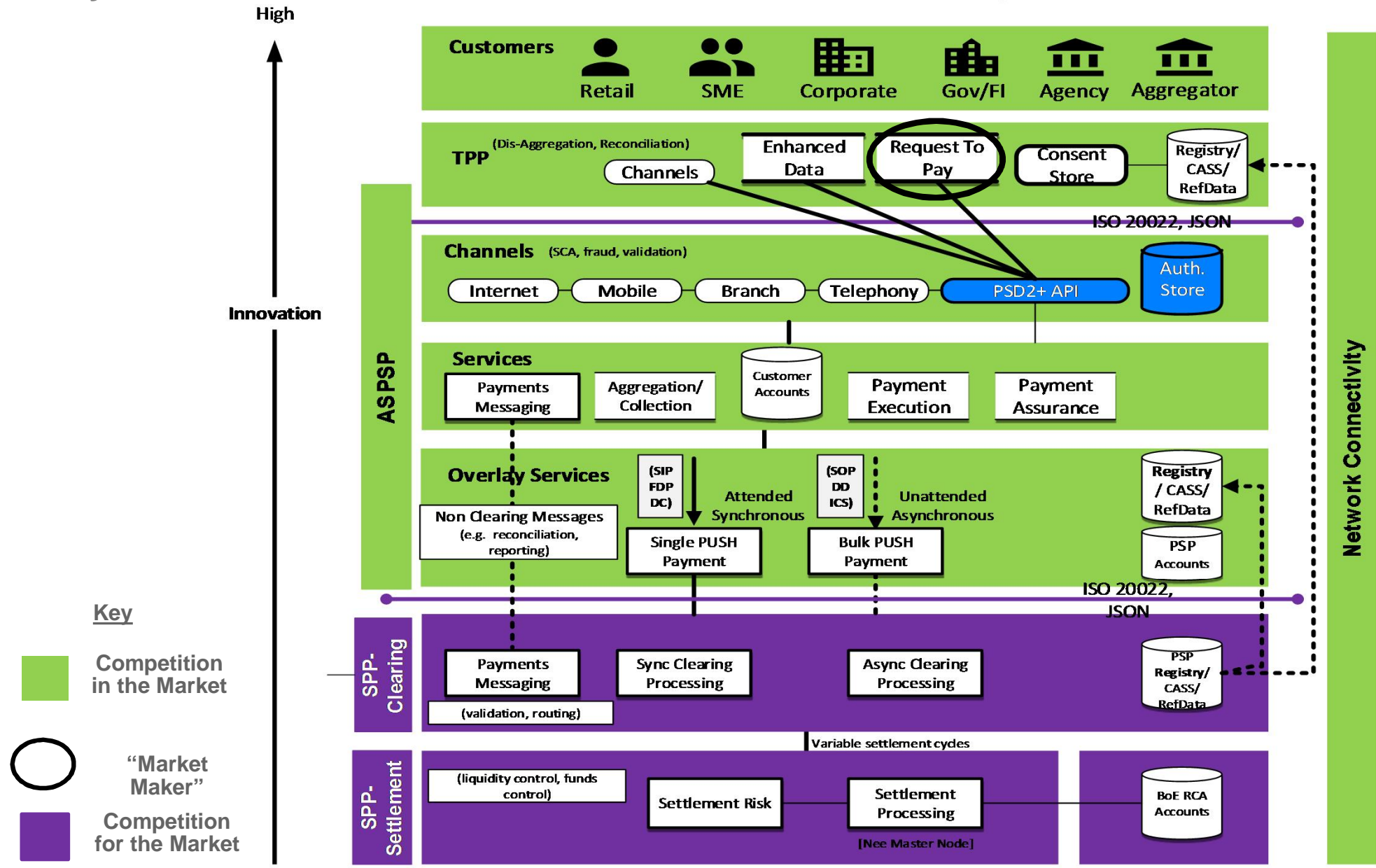
Competition categories

We propose a 4-layered categorisation of funding approaches



Anticipated competition in the New Payments Architecture (tbc)

A layered architecture will open up competition in UK payments



Q&A

- ▶ Do you agree with our approach to the commercial models: competition for the market and competition in the market?
- ▶ How do you think we can open up more competition in the bucket: 'competition for the market' ?
- ▶ Are there still advantages to being a provider of element(s) of the NPA that are categorised as 'competition for the market' that could put other providers at a disadvantage?



Wrap up