EUROPEAN CENTRAL BANK

EUROSYSTEM

Information session for front-end prototype providers

AGENDA

18/07/2022 – 14.00-16.00

Welcome and presentation of the team

➤ The digital euro project
➤ Use cases, design specifications, and principles for selection
➤ Specification of the API
➤ Working modalities & next steps

Today's panel

Evelien Witlox
Programme manager

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Prototype & technical
architecture team member

Lukas Schäfer
Business model team member

Philip Conrad Nadler
Prototype & technical architecture
team member

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Project manager

Nico Schmidt
PMO team member

Luigi Pedace
Business model team member
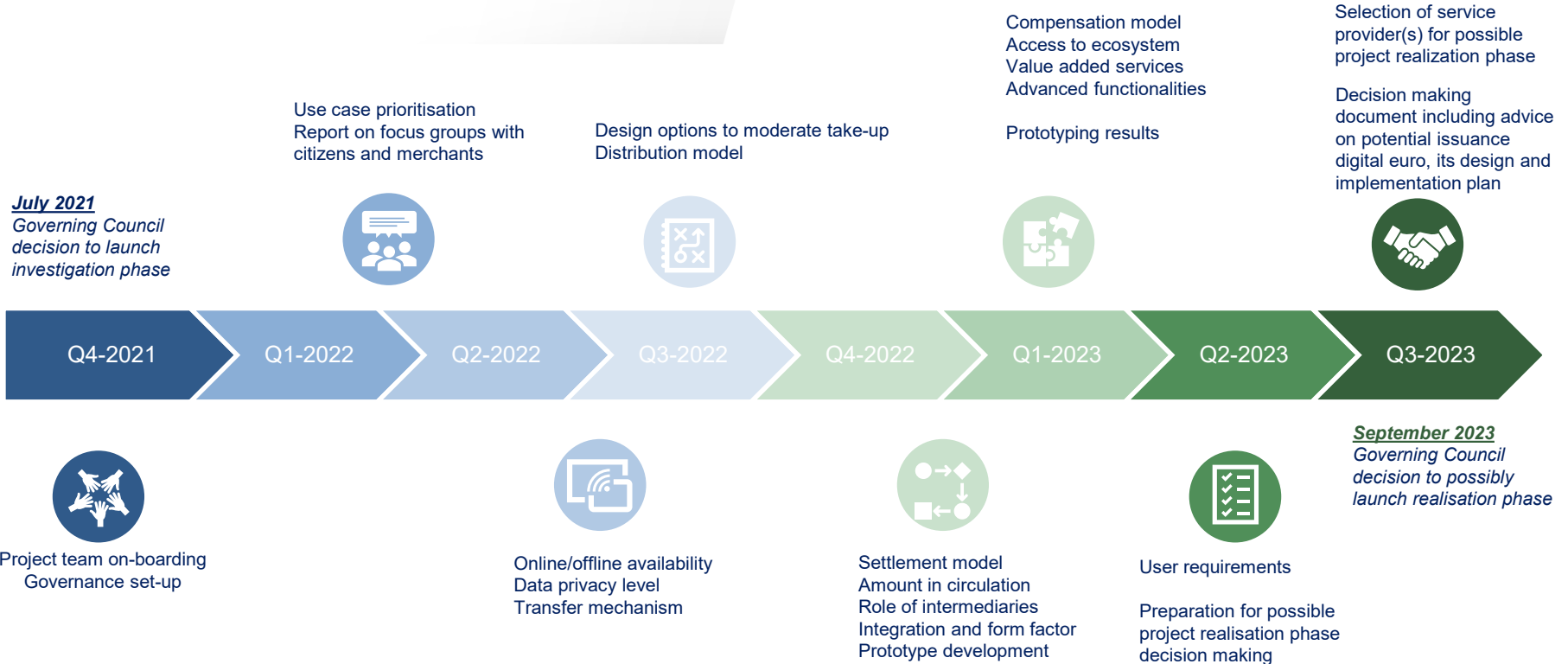
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➤ Working modalities & next steps

18/07/2022

Digital euro project timeline

Compensation model
Access to ecosystem
Value added services
Advanced functionalities

Prototyping results

Selection of service provider(s) for possible project realization phase

Decision making document including advice on potential issuance digital euro, its design and implementation plan

Use case prioritisation
Report on focus groups with citizens and merchants

Design options to moderate take-up
Distribution model

July 2021
Governing Council decision to launch investigation phase

| Q4-2021 | Q1-2022 | Q2-2022 | Q3-2022 | Q4-2022 | Q1-2023 | Q2-2023 | Q3-2023 |

September 2023
Governing Council decision to possibly launch realisation phase

Project team on-boarding
Governance set-up

Online/offline availability
Data privacy level
Transfer mechanism

Settlement model
Amount in circulation
Role of intermediaries
Integration and form factor
Prototype development

User requirements

Preparation for possible project realisation phase decision making

Tentative - timing subject to change

Goals of prototyping

Gain a concrete reassurance that the combination of requirements can be met in practice

Evaluate technology aspects early, when it's less risky

Support other activities and deliverables of the investigation phase (user requirements, planning of next phase, …)

The prototype is not meant to become the core of a later production system. It is a research tool.

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Digital euro prototyping timeline

- Select provider for the front-end prototypes

- Contractual agreements

- Provision of Eurosystem API specification
- Begin development

- Ready prototypes
- Share final testing reports

- Evaluate exercise

July	August	September	October	November	December	January	Long-term

Eurosystem prototype development (back-end and API)

Front-end prototyping

Joint integration testing

Q1 2023
Eurosystem to publish report/news item on the outcome of the exercise
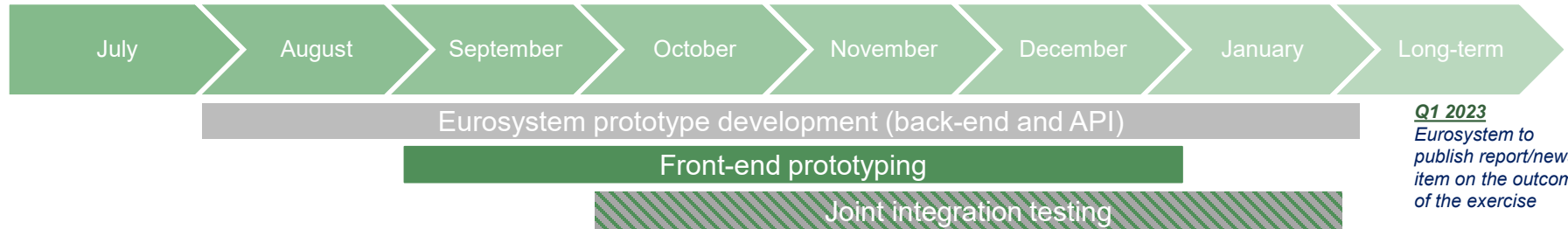
Tentative - timing subject to change

Areas to explore in the front-end prototyping

The **end-to-end process** for a transaction in digital euro for a selection of use cases.

The allocation of functions to either the front-end or back-end system.

The specification of the interface between the front-end and the back-end.

Use cases

The following use cases have been prioritised for the front-end prototype:

Person-to-person (P2P) online	Person-to-person (P2P) offline
Point-of-sale (POS) – Payee initiated	Point-of-sale (POS) – Payer initiated
E-commerce	

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Specifying a digital euro front-end

Design approach

Report on a digital euro*:

"supervised private intermediaries should have the opportunity to

use their expertise and participate in the provision of payment services"

Form factor: based on bilateral discussion	**Technology to transmit information (e.g. NFC/QR-code for POS/P2P)**: based on bilateral discussion
Accessibility: Online P2P use case should comply with European Web Accessibility directive	

*https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf

The selection process of the front-end prototype providers will be based on a three-step process.

Selection approach

In total, **56 applications** were received from which **5 providers** will be selected to develop a front-end prototype.

The applicants were asked to provide information regarding 4 essential capabilities and 28 specific capabilities.[1] The fulfilment of the essential capabilities was a necessary condition for further consideration.

The **first round of criteria** will apply weights to the specific capabilities **for each use cases.**

Based on this weighting a further qualitative analysis will **identify the most qualified providers per use case.**

1: See application questionnaire for further information on the capabilities (link)

Three step process for the selection of a front-end prototype provider

Minimum requirements

The **fulfilment of the essential capabilities** was a *necessary condition* for admission to the pool.

Primary criteria

Use case expertise and quality of responses: *Based on a weighting of the specific capabilities and the quality of the answers provided, the suitability of the applicant to provide a prototype for one of the use cases (P2P, eCommerce, POS, offline) will be assessed and the final provider will be selected.*

Secondary criterion

Market coverage*: In how many different European countries is the front-end provider active?*

→ This will be assessed by the specific capability: Offering a payment solution with pan-European reach

Q&A

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➢ Working modalities & next steps

The structure of the prototype

- *The prototype consists of **multiple technical components** enabling to simulate a payment end-to-end*

- *The main components are:*
  - *CLM*
  - *Offline Module*
  - ***Core Ledger***
  - ***Payment Service & Front-end module***

- *For the front-end the focus is on the payment services and their end-user interfaces*
  - *The payment services provide **core functionalities** including authorization and authentication of payments*
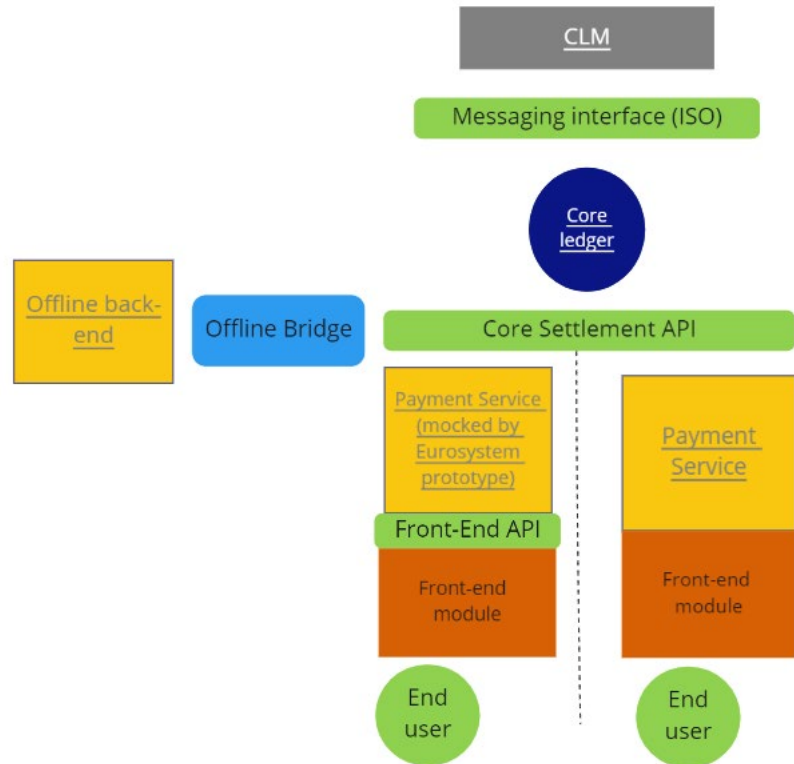
Prototyping staged approach

- *Focus on the interconnection of components via:*
    - *CLM Messaging Interface*
    - *Core Settlement API*
    - *Front-End API*

- *The backend core ledger is **developed in parallel** with the front-end*

- *Given this, the interaction of the front-end providers with the backend will be conducted via a **front-end facing API layer***

- *Front-end prototype development directly on the core settlement API layer is optional*
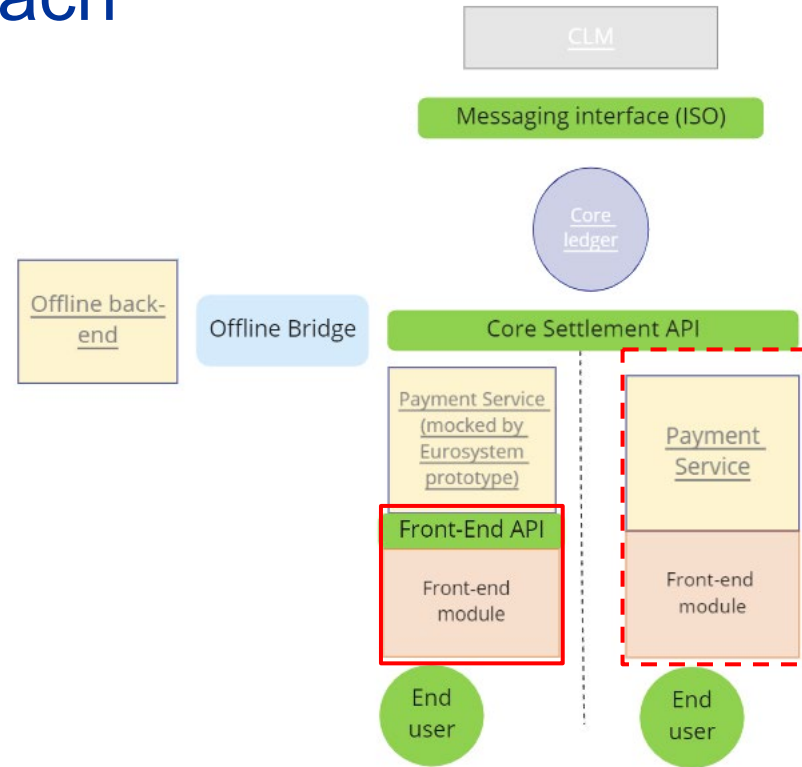
The prototype interfaces

- *We will provide a mock-up for front-end development*

- *Additionally, front-end developers can directly incorporate functions of payment services*

- *The ECB Payment Service mock-up envisages the communication for the prototype between users and the intermediaries via a Berlin Group based Front-End API layer.*
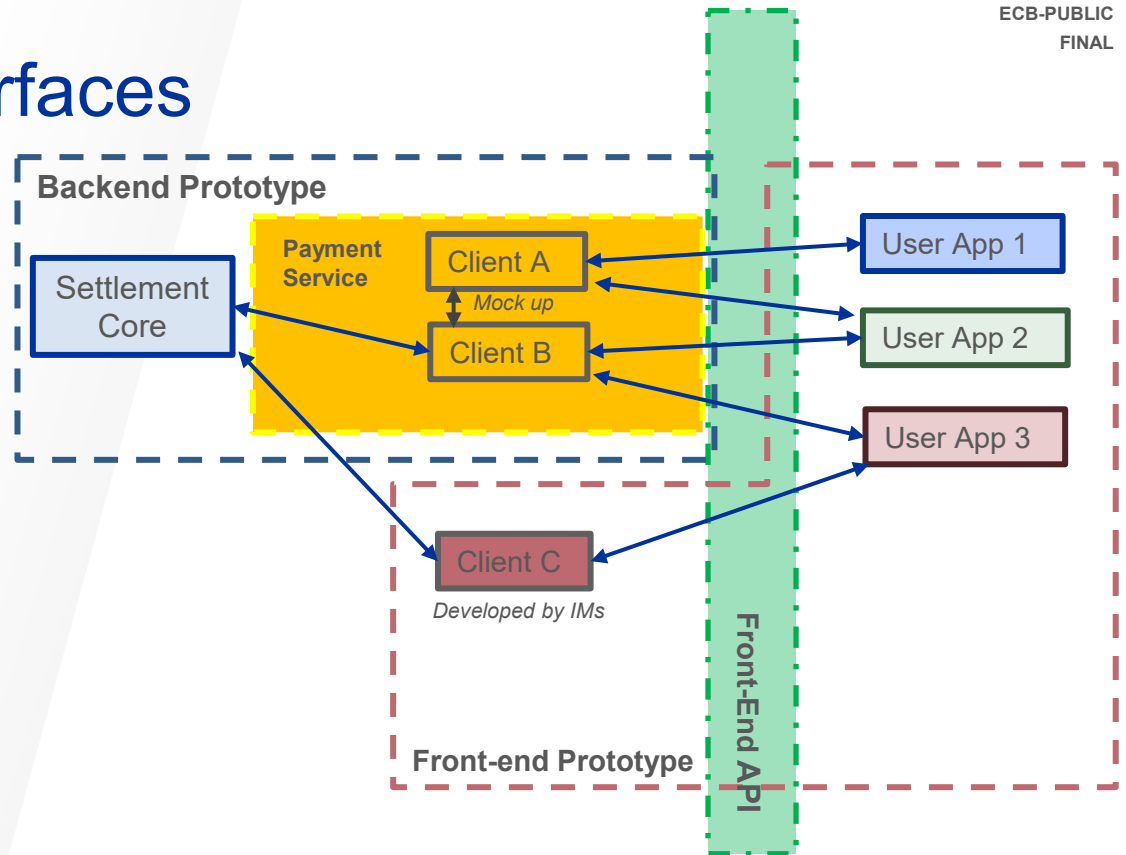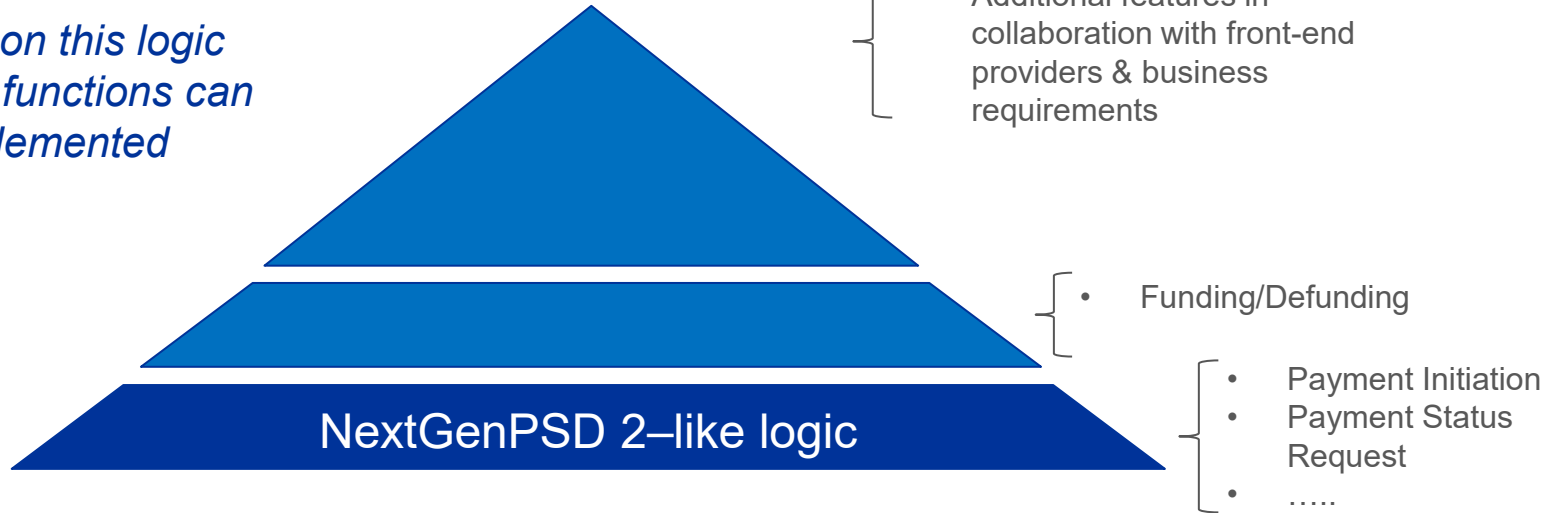
Leveraging PSD2-logic

- *How to establish the low-level technical logic of the API?*
  - *RESTful design vs Message Queues?*
  - *Message Format?*
  - *Asynchronous vs Synchronous design?*
  - *Functionality?*

- *We **leverage the existing logic of PSD-2** layers and aim to augment them with extra functions specific for the Digital Euro.*

- *This is on a **technical level only** and serves as basis for defining the business logic*

The prototype PSD2-logic

- *The PSD2 like API sets the general logic of the protocol*

- *Based on this logic further functions can be implemented*

- Additional features in collaboration with front-end providers & business requirements

- Funding/Defunding

NextGenPSD 2–like logic

- Payment Initiation
- Payment Status Request
- …..

The prototype PSD2-logic - Example

- *At the implementation level, we leverage the existing NextGenPSD2 standards:*
  - *Similarity of endpoints*
  - *Data structures of payloads*

- *This can be compiled into an API client to interact with*

Account Information Service: Read Balance
Endpoint: accounts/{payment-product}/{account-id}/balance
Method: GET
Response Body:

Data Element	Type	Description
account	String	Identification of the account
balance	Number	Current balance of the account
limit	Number	A quantity specifying the limit of the account

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18/07/2022

Working modalities of the cooperation

——— Legal framework ———

- No remuneration
- Providers can disclose the collaboration, without disclosing any content
- Providers can publish their work *after* the activities, and with ECB written consent
- Eurosystem publishes a report after the activities close
- Eurosystem can publish their API and other prototyping related documentation in the future
- Possibility to use a front-end prototype in a focus groups exercise upon consent of both parties

——— Working mode ———

During the development:
- Bilateral, fortnightly technical progress sessions, or more when needed
- Q&A shared across all providers
- Continuous integration

Outcome:
- Final report to be drafted by the providers on the functional scope and main learnings
- Presentation of the prototype to the Eurosystem
- Video that simulates the use of the prototype
- Access to the prototype in a demo environment

Final report

- *Payment solution*
  Describe your payment solution and its place and integration within the larger payment landscape (e.g. in terms of integration with payment acceptance devices and networks). Please also describe the technical stack and the implemented security measures of the solution.

- *Use case*
  Describe in detail the use case your solution is addressing (in terms of transaction parties - like consumers, businesses, government - and environment (e.g. physical, virtual)) and which current shortcomings in the market it addresses. Describe in detail the added value (for consumers, issuers and distributions of a digital euro) of your solution.

- *Branding*
  Describe how your solution complies with the digital euro branding requirement and how a value proposition could be translated to users of the new payment solution to (existing) users.

- *Privacy and user consent*
  Describe how your solution complies with regulatory standards (AML, KYC, GDPR) and which additional privacy features can be offered to users.

Final report

- *Requirements to the ecosystem*
  Describe in detail which requirements your solution would have for a live digital euro ecosystem. Please include justifications how the requirements are related to the business model of offering digital euro front-end services

- *Lessons learned and recommendations for further investigation*
  Describe in detail the most important lessons learned from this activity and recommendations for further investigation (including the end-to-end transaction, the allocation of functions between the front-end prototype and the Eurosystem interface and back-end and the functionality of the interface itself).

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Next steps

1 Select providers

- Selecting providers for the defined use cases by end of July* and share contractual details
- Initiate signatures in early August

2 Provide technical details

- ECB to provide technical specifications of the API in September
- ECB development team can be contacted from September onwards

3 Start development

- ECB to setup administrative frame (i.e. recurring meetings, collaboration tools)

*If you want to withdraw your application, please notify us by 22/07/22!

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Q&A

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Thank you!