Information session for front-end prototype providers

AGENDA

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

18/07/2022 – 14.00-16.00
Today’s panel

Evelien Witlox
Programme manager

Lydia de Jongh – Veneman
Prototype & technical architecture team member

Lukas Schäfer
Business model team member

Philip Conrad Nadler
Prototype & technical architecture team member

Mayte Arráez González
Project manager

Nico Schmidt
PMO team member

Luigi Pedace
Business model team member
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18/07/2022
Digital euro project timeline

**July 2021**
Governing Council decision to launch investigation phase

Q4-2021
Project team on-boarding
Governance set-up

Q1-2022
Use case prioritisation
Report on focus groups with citizens and merchants

Q2-2022
Design options to moderate take-up
Distribution model

Q3-2022
Compensation model
Access to ecosystem
Value added services
Advanced functionalities
Prototyping results

Q4-2022
Selection of service provider(s) for possible project realization phase

Q1-2023
Decision making document including advice on potential issuance digital euro, its design and implementation plan

Q2-2023
Selection of service provider(s) for possible project realization phase

Q3-2023
Selection of service provider(s) for possible project realization phase

Tentative - timing subject to change

**September 2023**
Governing Council decision to possibly launch realisation phase

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
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.
Digital euro prototyping timeline

- Select provider for the front-end prototypes
- Contractual agreements
- Provision of Eurosistema API specification
- Begin development
- Ready prototypes
- Share final testing reports
- Evaluate exercise

Q1 2023
Eurosistema 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.
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18/07/2022
Use cases

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

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person-to-person (P2P) online</td>
<td>Person-to-person (P2P) offline</td>
</tr>
<tr>
<td>Point-of-sale (POS) – Payee</td>
<td>Point-of-sale (POS) – Payer</td>
</tr>
<tr>
<td>initiated</td>
<td>initiated</td>
</tr>
<tr>
<td>E-commerce</td>
<td></td>
</tr>
</tbody>
</table>
### Specifying a digital euro front-end

**Design approach**

<table>
<thead>
<tr>
<th>Form factor:</th>
<th>based on bilateral discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility:</td>
<td>Online P2P use case should comply with European Web Accessibility directive</td>
</tr>
</tbody>
</table>

**Technology to transmit information (e.g. NFC/QR-code for POS/P2P):** based on bilateral discussion

**Report on a digital euro***:

> "supervised private intermediaries should have the opportunity to use their expertise and participate in the provision of payment services"  

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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 case.

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

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1: See application questionnaire for further information on the capabilities ([link](#))
Three step process for the selection of a front-end prototype provider

<table>
<thead>
<tr>
<th>Minimum requirements</th>
<th>The <strong>fulfilment of the essential capabilities</strong> was a <em>necessary condition</em> for admission to the pool.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary criteria</strong></td>
<td><strong>Use case expertise and quality of responses:</strong> 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.</td>
</tr>
</tbody>
</table>
| **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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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

NextGenPSD 2–like logic

- Funding/Defunding
  - Payment Initiation
  - Payment Status Request
  - .....  

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

<table>
<thead>
<tr>
<th>Data Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>account</td>
<td>String</td>
<td>Identification of the account</td>
</tr>
<tr>
<td>balance</td>
<td>Number</td>
<td>Current balance of the account</td>
</tr>
<tr>
<td>limit</td>
<td>Number</td>
<td>A quantity specifying the limit of the account</td>
</tr>
</tbody>
</table>

Account Information Service: Read Balance

**Endpoint:** accounts/{payment-product}/{account-id}/balance

**Method:** GET

**Response Body:**

- At the implementation level, we leverage the existing NextGenPSD2 standards:
  - Similarity of endpoints
  - Data structures of payloads
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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).
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!
Q&A
Thank you!