Roles in the processing of digital euro payments

Market Advisory Group

16/09/2022

Digital euro project team
Where do we stand?

**Tentative - timing subject to change**

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

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

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

**Q1-2022**
Design options to moderate take-up
Distribution model

**Q2-2022**
Compensation model
Access to ecosystem
Value added services
Advanced functionalities
Prototyping results

**Q3-2022**
Settlement model
Distribution of amount in circulation
Role of intermediaries
Integration and form factor
Funding and defunding
Prototype development

**Q4-2022**
Selection of service provider(s) for possible project realisation phase
Decision making document including advice on potential issuance digital euro, its design and implementation plan

**Q1-2023**
User requirements
Preparation for possible project realisation phase decision making

**Q2-2023**

**Q3-2023**

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

- Selection of service provider(s) for possible project realisation phase
- Decision making document including advice on potential issuance digital euro, its design and implementation plan

**Tentative - timing subject to change**
Objective of today’s exchange

Present Eurosystem’s analysis on the roles of supervised intermediaries and the Eurosystem in the processing of digital euro payments

Invite your feedback on the roles in the processing of digital euro payments identified by the Eurosystem followed by written procedure as input for Eurosystem preparations of final decisions on these options by Governing Council in Q4 2022
Roles at glance
Functional building blocks

User management
- Onboarding, Lifecycle management and Offboarding
  - Digital euro holder
  - Merchant
  - Intermediaries

Transaction management
- Transaction initiation and processing
  - Transaction initiation
  - Proxy lookup
  - Authentication (SCA)
  - Pre-validation
  - Fraud management
- Exception Handling
  - Settlement instruction
  - Settlement validation
  - Settlement recording
  - Post settlement

Liquidity management
- S. Intern. liquidity
  - Liquidity transfer
- Digital euro in circulation
  - Funding
  - Defunding
- Control of amount in circulation
  - Holding limits
  - Remuneration

[optional or conditional]
E2E process flow: user management

**Request to open digital euro account/wallet**
- End user’s request to access digital euro environment

**End user onboarding (including KYC process)**
- User’s manager performs know your customer procedure

**Holdings opening**
- Repository operator checks that onboarding would not exceed maximum number of digital euro accounts/wallets per user

**Confirmation of opening**
- Eurosystem and intermediaries complete required tasks giving access to digital euro holdings via relevant account/wallet

**Definition of payment instrument**
- Issuer of payment instrument offers it and links it to the relevant digital euro account/wallet

**Linking of instrument to account/wallet**
- User manager can link digital euro account/wallet with existing commercial bank money account to enhance funding/defunding experience
E2E process flow: liquidity management

(Main focus of the next agenda item)

**Funding**
- **Funding request**: A digital euro holder wants to fund digital euro holdings.
- **Source selection process**: The funding source is selected among cash or commercial bank money through different payment instruments.
- **Transfer of digital euro**: The funding amount is deducted from the supervised intermediary’s central bank liquidity and added as newly issued digital euro to the end user holdings.
- **Digital euro funding process**: The funded digital euro becomes available to the end user.
- **Confirmation to the digital euro holder**: The supervised intermediary makes the new digital euro holdings visible/available to the end user.

**Defunding**
- **Defunding request**: End user wants to defund digital euro holdings.
- **Defunding initiation**: Defunding process is initiated via intermediary.
- **Transfer of digital euro**: Digital euro holdings of end user are transferred to intermediary’s liquidity at the central bank.
- **Conversion of digital euro to commercial bank money account**: The intermediary makes the CoBM available in the account of end user.
- **Confirmation to digital euro holder**: The intermediary presents the new balance on the digital euro holdings and CoBM account to the end user.

CoBM: commercial bank money
E2E process flow: transaction management
(Main focus of this agenda item)

**Pre-settlement activities**
- **Transaction initiation**: Payer and payee exchange data to initiate (amount, payer/payee account/address).
- **Authentication**: Payer authenticates by means received from intermediary or eID – intermediary confirms.
- **Pre-validation**: Validation required by intermediary (e.g. user status).

**Settlement activities**
- **Settlement validation**: Check availability/integrity of digital euro to be sent and settlement message.
- **Settlement recording**: Actual transfer of money (settlement) implying updated amounts of central bank liabilities held by different users and collectively available to them.

**Post-settlement activities**
- **Notification**: Payer and payee are provided with info on successful payment.
Processing of digital euro payments: focus on settlement activities
Eurosystem digital euro report, 2020 (executive summary): “While the Eurosystem would always retain control over the issuance of a digital euro, supervised private intermediaries would be best placed to provide ancillary, user-facing services and to build new business models on its core back-end functionality. A model whereby access to the digital euro is intermediated by the private sector is therefore preferable.”

While digital euro will be a direct liability of the Eurosystem, accounts/wallets are to be opened by supervised intermediaries: no direct contractual relationship shall exist between Eurosystem and citizens.

IMF, 2022 (page 8): “So far, there is a convergence on the intermediated model. No central bank in this survey has explored the [...] synthetic CBDC models”
Analysis on who should operate settlement tasks

- Digital euro recorded in main ledger are akin to issued central bank liability, independent of possible cyber incidents or mistakes
- No contractual arrangements vis-à-vis the supervised intermediaries (e.g. if an intermediary ceases to operate) can protect Eurosystem balance sheet from erroneous recording of digital euro holdings

Offline payments pose no doubt on allocation of validation and recording:

Local storage: with physical payments devices certified under rules set by the Eurosystem

For online payments, the two technical tasks could be operated:

By the Eurosystem central banks: checking money availability/integrity and recording digital euro payments

By the Eurosystem central banks and supervised intermediaries: with supervised market participants checking money availability and the Eurosystem central banks recording digital euro payments, or vice-versa

By supervised intermediaries: with supervised market participants checking money availability and recording digital euro payments
Online settlement: based on the comparative assessment, settlement validation and recording by the Eurosystem central banks ranks highest

- Allows the Eurosystem to maintain control over central bank money settlement, as opposed to only establishing settlement rules and risk mitigation measures as for the other options
- Balance sheet risk under control (in-house risk only)
- Efficiency and level playing field of Eurosystem operating a shared component, as opposed to individual systems to be set up by intermediaries abiding to Eurosystem’s rules and exchanging information
- Lower project delivery risk for implementation of back-end, as opposed to external dependencies
- Allows distribution of data and processing among entities (geographically and for privacy)
- Intermediaries provide digital euro accounts/wallets and all user-facing services, leaving only settlement validation/recording of central bank liabilities to the Eurosystem central banks

Note: distribution of data and its processing* (geographically and for privacy), structure of the ledger and provision of the digital euro position to end user depend on the concrete technical implementation and are possible irrespective of the settlement model.

*: Settlement can be distributed across Eurosystem central banks relying on traditional or distributed ledger technology
Functional building blocks

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  - Merchant
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  - Pre-validation
  - Fraud management
  - Settlement instruction
  - Settlement validation
  - Settlement recording
  - Post settlement

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    - Defunding
  - Control of amount in circulation
    - Holding limits
    - Remuneration
Way forward and discussion
Way forward

- **Further investigation** on privacy, (cyber-)resilience and contractual relationships

- **Consultation of Eurosystem committees**

- **Outreach to external stakeholders** on the roles of intermediaries and the settlement model options for offline and online digital euro transactions

- Finalisation of Eurosystem views on allocation of roles the processing of digital euro payments in Q4 2022 based on the outcome of Eurosystem committees’ consultation, discussions with external stakeholders and additional internal analysis

- Review of combined design decisions (“bringing it all together”) in Q2 2023 and feedback by stakeholders on overall design prior to Governing Council decision making thereafter
We invite **reflections on all aspects of the analysis**, including the following questions:

- What are your views on the digital euro payments processing flows and the roles of supervised intermediaries within them?

- Do you see any issue in the Eurosystem central banks validating and recording transfers of its own liability (digital euro) while supervised intermediaries would take care of access/payment initiation/information and value-added services?

- What would be your views on the Eurosystem’s ability to have full reassurance that no mistakes outside its control will happen, during validation and recording, affecting its own balance sheet in case supervised intermediaries were to take care?

- What would be your views on the cost dimension of different settlement model options – i.e. Eurosystem providing a single shared component vs. supervised intermediaries building their own validation and/or recording systems adhering to standards set by the Eurosystem?
Thank you