Prototype background, set-up and goals

Test technical implementation of design choices

Test integration in existing European payments landscape

Learn, not build a production solution

1
Back-end prototype
Developed by the Eurosystem

Jul 2022 - Feb 2023

Use cases

5
Front-end prototypes
Developed by selected participants

No personal data were processed in the prototyping exercise either by the ECB or by the front-end prototype participants.

Point of sale (PoS): payer & payee-initiated

Person to person: online & offline

E-commerce
Prototype exercise results

Possible to smoothly integrate digital euro into the existing European payments landscape, while leaving ample room for innovative features and technologies.

A digital euro could in principle work both online and offline, using independent designs.

Important: the specific choices made for the prototypes do not affect any decision relating to a specific technology or functionality for the final digital euro design. The API specifications do not prejudge possible alternative designs. The actual prototypes presented will be discarded and not used further.
Back-end prototype

What we developed

- **N€XT**, a **bespoke centralized settlement system** developed from scratch by the Eurosystem
- Not a DLT, but based on a **UTXO data model** (greatest potential for learning)

What we learned

UTXO model allows for fast and efficient validation of transactions

Transaction model based on UTXO can support different types of transactions (future proof)...

... while protecting user privacy by not revealing payment patterns or account balance to the Eurosystem
Front-end prototypes

What was developed

<table>
<thead>
<tr>
<th>P2P online</th>
<th>P2P offline</th>
<th>E-commerce</th>
<th>POS payer</th>
<th>POS payee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caixa Bank</td>
<td>Worldline</td>
<td>Amazon</td>
<td>EPI</td>
<td>Nexi</td>
</tr>
<tr>
<td>Mobile app</td>
<td>Mobile app</td>
<td>Online shopping</td>
<td>Customer app +</td>
<td>Customer app +</td>
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<tr>
<td>Alias</td>
<td>Secure Element, NFC</td>
<td>Wallet webapp</td>
<td>Merchant app QR codes</td>
<td>Smart POS NFC + QR codes</td>
</tr>
</tbody>
</table>

What we learned

- **Smooth interaction** between front-end and back-end with room for **innovative approaches**; adaptation effort for existing PSP systems remains to be evaluated
- **Offline and online can have different data models and be interoperable**: offline data model can be also balance based. **Maturity still a challenge.**