

Topic 1: Wallet Integration and Value-Added Services of the Digital Euro: Implications for Banks

Research Focus – Version A

(Value-Added Services as the Strategic Focus)

This thesis examines how European banks can leverage the introduction of the digital euro to design and commercialise a portfolio of digital-euro-enabled value-added services (VAS). Building on new wallet functionalities - such as conditional payments, programmability, digital identity integration, offline capabilities, and instant settlement - the research investigates how banks can generate new revenue streams, strengthen customer relationships, and differentiate themselves in a competitive payments landscape dominated by FinTechs and BigTech wallet providers.

The study aims to identify, evaluate, and prioritise the most promising value-added service opportunities for banks. It further explores how these services can address consumer and merchant needs, complement existing payment solutions, and position banks as key orchestrators in the emerging digital euro ecosystem. By combining ecosystem analysis, expert insights, and a structured evaluation framework, the thesis develops strategic recommendations for how banks can turn the digital euro from a regulatory requirement into a commercial competitive advantage.

- + Technical Implementation details for 4-5 most promising VAS's (+ mandatory)

Research Focus – Version B

(Digital Euro Wallet Architecture and Operating Model)

This thesis investigates how European banks should design and implement digital euro wallet infrastructures to ensure secure, efficient, and future-proof integration with the Digital Euro Service Platform (DESP). It examines the architectural, technical, and operational decisions

required for banks to connect to DESP, manage Dedicated Cash Accounts (DCA), enable conditional payments, support offline wallet functionalities, and integrate digital euro services into their existing mobile banking platforms and frontend systems.

Outline:

1. Introduction

1.1 Background and Motivation

Digitalisation, declining cash usage, and the rise of BigTech wallet ecosystems are reshaping the European payments landscape. The ECB's Digital Euro initiative introduces a new form of public digital money, accompanied by the Digital Euro Service Platform (DESP) and a comprehensive scheme rulebook. These developments represent a structural shift for banks, both technically and strategically.

1.2 Problem Statement

Banks face uncertainty regarding how best to integrate digital euro wallets into their existing infrastructures, how to differentiate in a competitive landscape dominated by FinTechs and BigTechs, and how to monetise new wallet functionalities. A key strategic question is how digital-euro-enabled value-added services can strengthen banks' relevance and unlock new revenue potential.

1.3 Research Objectives and Questions

Primary focus:

1. Which digital-euro-enabled value-added services (VAS) offer the highest strategic and commercial potential for European banks?
 - a. Cluster the banks into different archetypes
2. How can banks use programmability, digital identity, and merchant-oriented features to differentiate themselves in an increasingly competitive payments environment?
3. How can Banks integrate the Digital Wallet into existing system for the most promising VAS's

Secondary focus:

1.

1.4 Structure of the Thesis

Overview of the chapters and their respective purposes.

2. Payments Ecosystem, Wallet Functionalities, and Digital Euro Foundations

2.1 The European Payments Ecosystem

Analysis of the current landscape, including card schemes, A2A payments, SEPA Instant, mobile wallets, and BigTech offerings. Identification of structural pain points for consumers and merchants.

2.2 Digital Euro Architecture and Core Functionalities

Overview of DESP, REST/gRPC integration, wallet design principles, offline payment capabilities, the Dedicated Cash Account (DCA), and conditional payments (reservations workflow).

2.3 User Expectations: Consumer Perspective

Synthesis of consumer research (ECB user studies, BEUC report). Discussion of expectations regarding security, privacy, low cost, ease of use, refunds, and universal acceptance.

2.4 User Expectations: Merchant Perspective

Analysis of merchant needs and pain points, drawing from ECB qualitative merchant interviews and complementary sources. Focus on fees, settlement speed, reconciliation processes, integration complexity, and fraud management.

3. Strategic Directions for Banks

3.1 Direction A: Value-Added Services as a Strategic Focus

Evaluation of value-added service opportunities enabled by digital euro functionalities such as programmability, digital identity, offline capabilities, and instant settlement. Categorisation into consumer-oriented, merchant-oriented, ecosystem-oriented, and infrastructure-oriented services.

3.2 Direction B: Digital Euro Wallet Architecture and Operating Model

Analysis of architectural integration models (custodial, hybrid, non-custodial), DESP connectivity patterns, risk systems, AML/Fraud integration, and options for build/partner/outsource. Mapping of bank operating model implications.

4. Methodology

[4.1 Expert Interviews]

Semi-structured interviews with banks, FinTechs, wallet providers, processors, infrastructure providers, merchants, and regulatory experts. Sample size of 10–12 interviews.

4.2 Qualitative Content Analysis

Document analysis of ECB publications, DESP technical documentation, consultancy whitepapers, bank strategy papers, and academic literature. Coding of recurring themes related to integration models, VAS opportunities, competitive positioning, and regulatory constraints.

-> get most relevant VAS's grouped for: merchants, consumers (including mandatory services: e.g. offline payments)

-> analyse design of most widely used Wallet types (e.g. Paypal)

-> compare with other countries too

4.3 Value-Added Service Evaluation Framework

Construction of a quantitative scoring model to prioritise VAS options. Evaluation dimensions may include: **technical feasibility, regulatory feasibility, consumer demand, merchant demand, revenue potential, differentiation potential, implementation effort, and time-to-market.**

-> comparison to crypto (DLT technology), possible advantages.

-> evaluate relevant VAS's

4.4 Wallet Integration into existing systems for VAS's (technical integration + Payments ecosystem)

How can the most promising VAS's be integrated into existing Systems (Including Mandatory Functionalities; e.g. offline payments)

- less technical

[4.5 Scenario Analysis]

Development of multiple future scenarios to test the robustness of VAS recommendations and integration strategies:

- BigTech led (paypal)
- Bank centric
- Stablecoins

4.6 Ecosystem Mapping and Strategy Archetypes

Mapping of ecosystem actors (banks, FinTechs, BigTechs, processors, merchants, identity providers, regulators). Definition of strategic archetypes for banks (e.g., Wallet Orchestrator, Programmability Platform Provider, Embedded Finance Provider, Interoperability Hub).

-> keep the grouping from earlier

5. Empirical Findings

5.2 Document Analysis Insights

Synthesis of institutional and technical documents on digital euro functionality, consumer and merchant research, market studies, and existing industry prototypes.

5.3 Integrated Themes and Patterns

Identification of converging and diverging viewpoints across sources. Summary of dominant VAS opportunities, integration challenges, and strategic pressures from BigTech and FinTech competitors.

6. Deep Dive into Priority Value-Added Services

For the highest-ranked VAS identified through the scoring model, each deep dive includes:

- Description of the service concept
- Underlying digital euro functionality (DESP, conditional payments, DCA)
- Market needs (consumer and merchant)
- **Feasibility analysis**
- **Revenue potential and monetisation models**
- **Competitive landscape analysis**
- Implementation roadmap and partnership options
- Risks and regulatory considerations

7. Strategic Recommendations for Banks

7.1 Prioritised VAS Portfolio

Recommendation of the 2–3 most viable VAS for banks based on scoring results, scenario robustness, and ecosystem positioning.

7.2 Integration and Operating Model Recommendations (technical)

Guidelines on how banks should integrate the digital euro into existing infrastructures and how they should structure internal capabilities to deliver the proposed VAS.

[7.3 Roadmap for Implementation]

Phased roadmap covering short-term pilots, medium-term architectural integration, and long-term strategic positioning.

8. Conclusion and Outlook

Summary of core findings, key contributions, strategic implications for banks and policy makers, limitations of the study, and suggestions for further research (e.g., DESP rulebook updates, real-world pilots, evolving merchant behaviour).

Appendix

- **Interview guide**
- **Coding trees**
- **Scoring model details**
- **Scenario narratives**
- **Technical diagrams for DESP integration**
- **Additional user research excerpts**