

Implementation for Banks in the Context of the Digital Euro

§1.0 Core DESP Services and Functions

| Service bundle | Key functions (what) | Responsibility (who) | Integration touchpoints (how) |
|--|--|---|--|
| Access & User Management | End-user onboarding/offboarding; wallet lifecycle; credential/authentication management; alias registration & look-up interactions; waterfall account setup as part of access services. | PSP (primary) + DESP shared services (e.g., alias look-up) | KYC/AML performed by PSP; exchange of scheme identifiers (e.g., DEAN/aliases, PSP identifiers); integrate PSP channels with DESP access/alias services and scheme onboarding/switching flows. |
| Liquidity & Limits Management | Funding/defunding initiation; holding-limit checks and automated limit handling; waterfall/reverse-waterfall execution logic; monitoring and reconciliation; reporting. | PSP (initiation, customer funds side) + Eurosystem/DESP (digital euro account/ledger side) | Treasury/core-banking integration for customer debits/credits; connectivity to DESP for funding/defunding and limit outcomes; reconciliation between internal ledgers and DESP settlement/ledger outputs. |
| Transaction Initiation & Authorisation | Payment initiation across P2P/POS/e-commerce; strong customer authentication; transaction validation prior to settlement instruction; user experience flows and channel enablement. | PSP (primary) | Integrate POS/e-com/P2P channels with PSP authorisation stack; connect PSP back-end to DESP interface for settlement instruction; maintain audit trails aligned with scheme requirements. |
| Settlement, Issuance & General Ledger | Verification and recording of digital euro transactions; maintenance of the general ledger for digital euro holdings; issuance and redemption of digital euro units. | Eurosystem/DESP | PSPs submit settlement instructions and query on behalf of users; integrate with DESP access gateway/API; align internal accounting and reporting with settlement confirmations and ledger states. |
| Risk, Fraud, Compliance & Disputes | AML/CFT and fraud controls; dispute intake and case handling; reporting and monitoring; consumption of scheme/DESP signals or components where provided; standardised dispute processes. | PSP (primary operations) + Scheme/DESP (standards/processes and possible shared components) | Integrate fraud/risk engines with digital-euro flows; implement dispute workflows consistent with scheme requirements; connect reporting interfaces and case management to any DESP dispute/risk components as applicable. |
| Offline Service | Offline holdings on device; secure local verification/recording; device-to-device offline payments; online reconciliation after reconnection; loss/theft recovery handling. | PSP (distribution, devices, support) + Eurosystem/DESP (offline model / scheme controls) | Enable offline-capable form factors; implement offline risk controls and recovery workflows; reconcile offline transactions into PSP ledgers and DESP records; handle customer support processes. |

Table 1: Digital euro service bundles, responsibilities, and bank integration touchpoints.

§2.0 Bank Back-End System Integration Pathways

Table 2: Bank integration dimensions for DESP connectivity and internal system impacts.

| Dimension | What changes (capabilities) | Primary bank systems impacted |
|---------------------------------------|--|--|
| Core banking / ledger integration | Customer reference mapping (Customer ID \leftrightarrow DEAN), alias linkage (via scheme services), holding-limit outcomes and automated liquidity logic (waterfall / reverse-waterfall), sub-ledger postings for funding/defunding and digital-euro account movements (DCA), statement views and internal accounting alignment. | Customer master/reference data, limits engine, sub-ledger/GL, accounting rules, statement engine, billing/invoicing and product configuration. |
| Integration layer (DESP connectivity) | Secure connector to DESP access gateway; API orchestration for funding/defunding and payment flows; mapping/transformation between internal formats and scheme messages; eventing, monitoring, resiliency patterns (retries, idempotency) and operational dashboards. | API management gateway, ESB, message bus/streaming, workflow/orchestration engine, monitoring/observability tooling. |
| Channels (customer + merchant) | Mobile/web UX for digital euro services; receipts and notifications; optional branch-assisted flows; acceptance/acquiring enablement where the bank is a merchant service provider. | Mobile/web apps, notification services, ATM switch, merchant portal. |

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| Dimension | What changes (capabilities) | Primary bank systems impacted |
|---------------------------|---|--|
| Back-office operations | Treasury operations for funding/defunding monitoring and replenishment; AML/CFT and fraud controls; dispute intake and case handling; customer support; reconciliation and regulatory/statistical reporting. | Treasury systems, compliance screening, fraud engine, dispute/case tooling, call-centre platform, reconciliation & reporting stack / data warehouse. |
| Security & key management | Strong identity and access controls for DESP connectivity; key/certificate lifecycle (signing/encryption); secure secrets storage; security logging and auditability; incident monitoring and response playbooks. | IAM, PKI/certificate management, HSM/secrets vault, log management, audit tooling. |

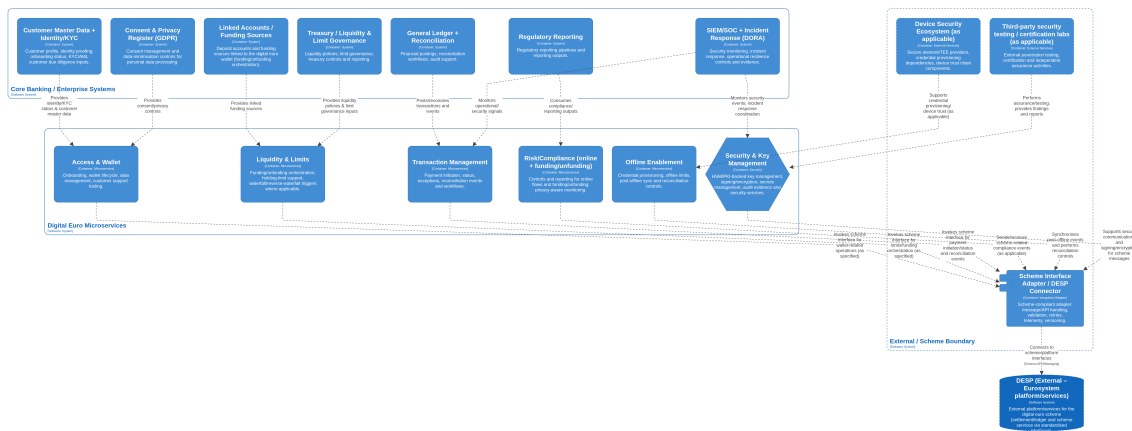


Figure 1: Integration with Existing Systems

§3.0 Technical Architecture

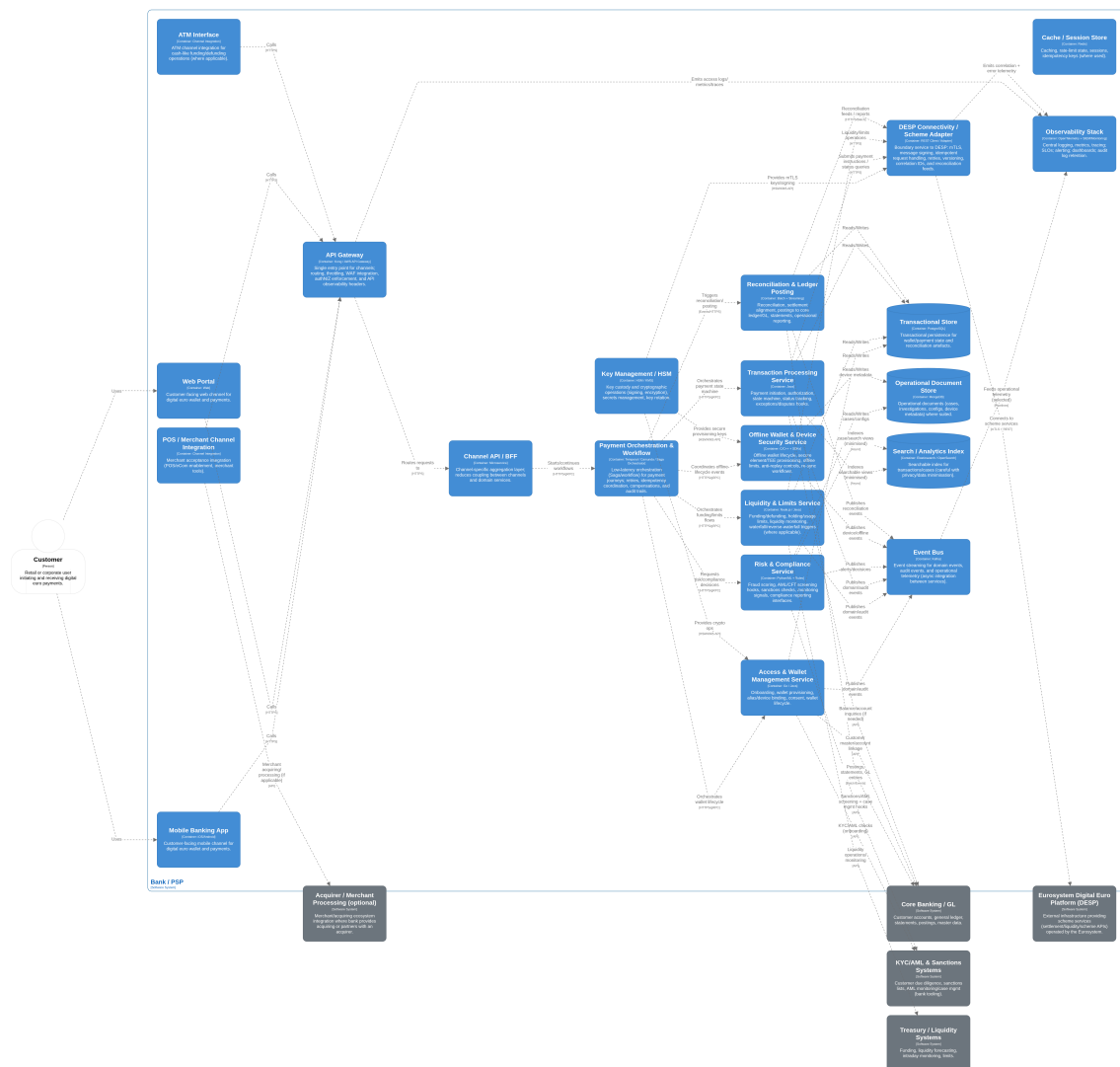


Figure 2: High-level technical architecture for bank integration with the Digital Euro Service Platform (DESP).

§4.0 Implementation Models

In-House Implementation

- **Team Requirements:** Backend Developers, Platform Architects, DevOps/SRE Engineers, QA/Testing Engineers, Security Engineers, Product/Business Analysts, Program/Project Manager, etc
- **Cost Category:** Personnel (36–52), External consulting (architecture, security, regulatory testing support), Cloud + security infrastructure (K8s, compute,

HSM/KMS,logs/monitoring), Tooling & software licenses(DevSecOps, collaboration, security tooling), Independent testing (pentest, performance, audits), Training professional development, and Contingency (10–15%)

- **Total Cost Estimates:** €24.2M - €57.2M
- **Risk Profile:** Legacy integration complexity, security vulnerabilities, etc

Vendor/Outsourced Implementation

- **Vendor examples:** Pan-European payment processors / infrastructure providers (e.g., Worldline, equensWorldline)
- **Service Model Options**
 1. Full-service platform model (“Digital Euro as a Service”)
 2. Component outsourcing model
- **Cost Category:** Personnel (8-12), Vendor onboarding & platform setup, External integration/architecture support, Security compliance testing, Training (ops, support, compliance, IT), and Contingency (10-15%)
- **Total Cost Estimates:** €4.1M - €8.5M
- **Risk Profile:** Limited customization, Third-party risk, Vendor lock-in etc

Hybrid Implementation

- **Team Requirements:** Backend Developers, DevOps/SRE Engineers, QA/Testing Engineers, Security Engineers, Product and Operations Manager.
- **Cost Category:** Personnel (15–25), Vendor core platform onboarding/implementation, Consulting, Testing, security, Tooling, Training and contingency (10-15%).
- **Total Cost Estimates:** €13.3M - €26.1M
- **Risk Profile:** Integration boundary complexity, dependency management, security coordination, etc

§5.0 Implementation Models by Bank Tier

High-Tier Banks

- **Bank Profile:** Greater than €300B

- **Recommended Implementation Approach:** In-House with Selective Partnerships
- **Core Strategy:**
 - Develop comprehensive in-house Digital Euro platform
 - Utilize selective partnerships for specialized components
- **Implementation Architecture**
 1. **Tier 1 : Core Development (In-House) - Core Platform Components**
Access Management Service, Liquidity Management Service, Transaction Management Service, Risk and Compliance Service
 2. **Tier 2 : Channel Integration (In-House + Partnerships) - Distribution Channels**
Mobile Banking, Web Banking, POS & Merchant, ATM Network
 3. **Tier 3 : Advanced Services (In-House Development)**
Conditional Payments, Loyalty & Rewards, Blockchain Integration (Future)

Mid-Tier Banks

- **Bank Profile:** €50 - €300B
- **Recommended Implementation Approach:** Hybrid Implementation with Vendor Partnerships
- **Core Strategy:**
 - Outsource core integration via vendor platform
 - Develop selective proprietary services for differentiation
 - Leverage vendor expertise while controlling costs
 - Achieve faster time-to-market than full in-house development
- **Implementation Architecture**
 1. **Tier 1: Vendor-Managed Core Components**
Access Management Service, Liquidity Management Service, Transaction Management Service, Risk and Compliance Service
 2. **Tier 2: Shared Infrastructure (Market-Based Collaboration)**
Shared infrastructure (POS/terminal), Shared Fraud Detection Consortium, Shared ATM Network Operations, Shared Testing Infrastructure

3. Tier 3: Bank-Developed Differentiation (Services)

Enhanced Customer Experience, Conditional Payments, Loyalty & Rewards, promotions

Low-Tier Banks

- **Bank Profile:** Less than €50B
- **Recommended Implementation Approach:** Vendor-provided platform with minimal customization.
- **Core Strategy:**
 - Engage established vendor for end-to-end Digital Euro platform
 - Minimize internal development and complexity
- **Implementation Architecture**
 1. **Vendor Platform - Vendor-Provided Services**

Access Management Service, Liquidity Management Service, Transaction Management Service, Risk and Compliance Service, Channel Integration, Reporting and Reconciliation, Operational Monitoring
 2. **Bank-Specific Configuration**

Brand integration, Customer support, Staff training, etc

§6.0 Shared Infrastructure

- Shared Testing Infrastructure
- Shared Fraud Detection and AML Services
- Shared ATM Network Operations
- Shared Digital Euro as a Service (DaaS) Platform

§7.0 Recommendations by Bank Tier

- High-tier banks (large, internationally active): In-house or Hybrid approach.
- Mid-tier banks (regional to multi-market): Hybrid as the default strategy.
- Low-tier banks (small, local): Vendor-provided platform with minimal customization.