

## Lesson 5: Open Banking and APIs

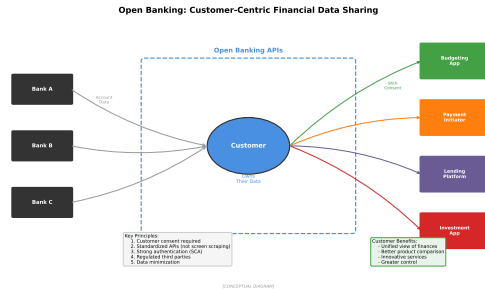
### Module 1: FinTech Fundamentals

Digital Finance

# Open Banking Revolution

## Data Sharing Paradigm

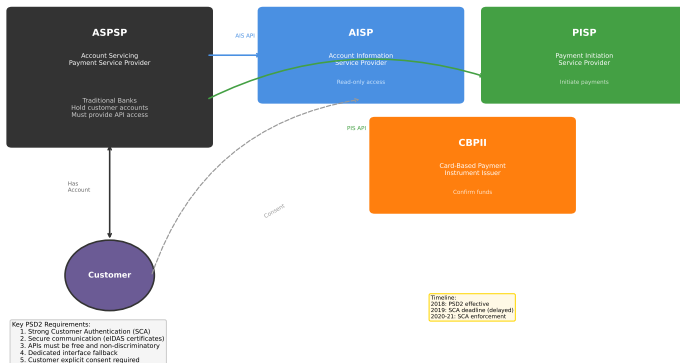
- Customer-permissioned access
- Standardized APIs
- Third-party innovation
- Regulatory mandate (EU, UK)



Open banking shifts data control from banks to customers—enabling competition and innovation.

## PSD2 Regulatory Architecture

Payment Services Directive 2 (EU 2015/2366)



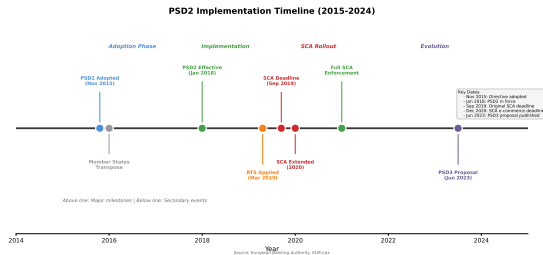
Source: EU Directive 2015/2366 (PSD2)

**PSD2 mandates banks provide API access to licensed third parties with customer consent.**

# PSD2 Timeline

## Implementation Phases

- 2015: Directive adoption
- 2018: SCA requirements
- 2019: RTS compliance
- 2021: Full enforcement

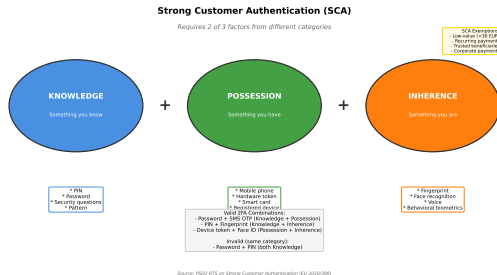


Full PSD2 enforcement took 6 years (2015-2021)—phased rollout reduced industry disruption.

# Strong Customer Authentication (SCA)

## Two-Factor Requirement

- Knowledge (password)
- Possession (mobile device)
- Inherence (biometric)
- Exemptions for low-risk



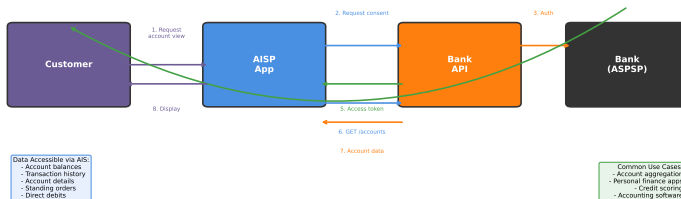
SCA requires 2 of 3 factors—knowledge, possession, or inherence—for secure authentication.

# Account Information Service (AIS)

## Account Information Service (AIS) Flow

Read-only access to account data

4. Bank redirects customer for SCA



[CONCEPTUAL FLOW DIAGRAM]

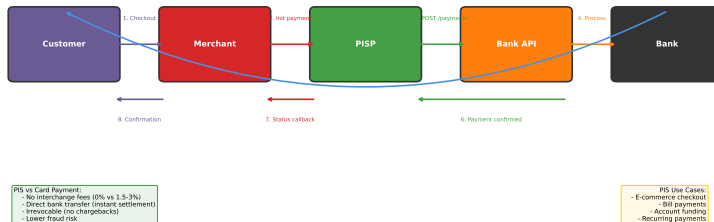
**AIS enables read-only account aggregation—view balances from multiple banks in one app.**

# Payment Initiation Service (PIS)

## Payment Initiation Service (PIS) Flow

Bank-to-bank transfer via open banking

### 5. Redirect customer for bank authentication (SCA)



[CONCEPTUAL FLOW DIAGRAM]

PIS enables direct bank-to-bank transfers—bypassing card networks entirely.

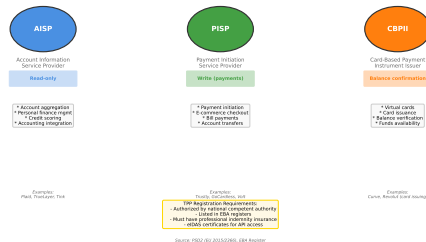
# Third-Party Providers (TPPs)

## Provider Types

- AISP: Account aggregation
- PISP: Payment initiation
- CBPII: Card balance checks
- Regulatory authorization

## Third Party Provider (TPP) Categories

*Note: A single provider can register for multiple TPP categories*

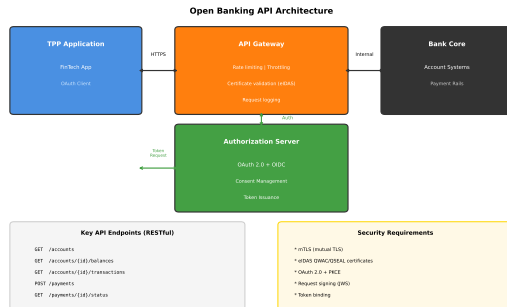


TPPs must obtain regulatory authorization—AISPs for data, PISPs for payments, CBPIIs for balance checks.



## Technical Protocols

- RESTful architecture
- OAuth 2.0 authorization
- OpenAPI specification
- JSON data format

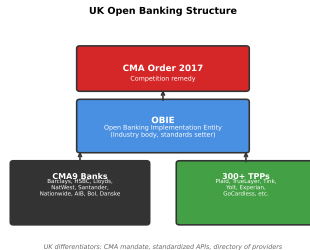
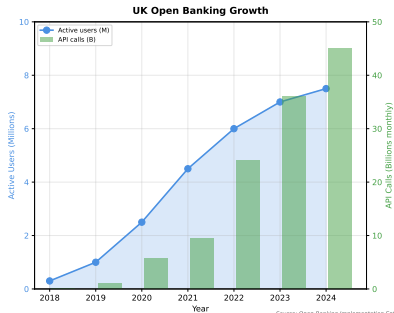


Source: Open Banking API specifications (Bole Group, UK OBO, STET)

RESTful APIs with OAuth 2.0 authorization are the standard—JSON format enables easy integration.

# UK Open Banking Implementation

## UK Open Banking: World-Leading Implementation



UK leads global adoption with 8M+ users—CMA9 mandate required 9 largest banks to open APIs.

# Open Banking Use Cases

## Consumer Applications

- Multi-bank aggregation
- Automated budgeting
- Alternative credit scoring
- Instant payments

## Open Banking Use Cases

**Account Aggregation**

View all bank accounts  
in one app

Personal finance apps, wealth dashboards, business accounting

[Single view of finances](#)

**Payment Initiation**

Pay directly from  
bank account

e-commerce checkout, B2B payments, P2P transfers

[Lower merchant fees](#)

**Credit Decisioning**

Real-time income &  
spending verification

Mortgage affordability, loan applications, BPP checks

[Faster approvals](#)

**Identity Verification**

Confirm identity via  
bank account ownership

Account opening, age verification, KYC checks

[Reduced fraud](#)

**Recurring Payments**

Variable recurring  
payments (VRP)

Subscriptions, sweeping savings, utility bills

[Flexible direct debits](#)

**Embedded Finance**

Banking in non-bank  
platforms

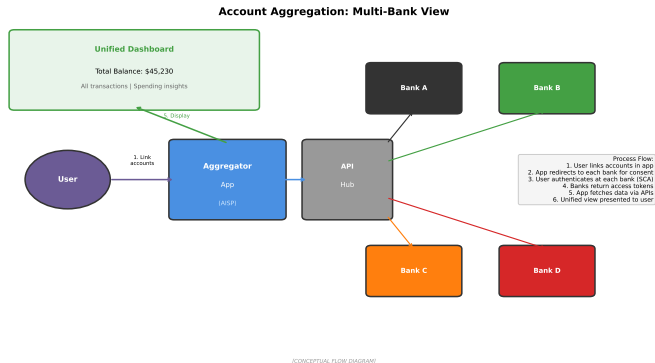
In-app payments, marketplace lending, insurance offers

[Contextual services](#)

UK Open Banking Adoption (OBSA)  
- 7.5M+ active users  
- 11M+ payments monthly  
- 80+ regulated providers  
Source: OBSA

Account aggregation and automated budgeting are the killer apps—alternative credit scoring expands lending.

# Account Aggregation Example

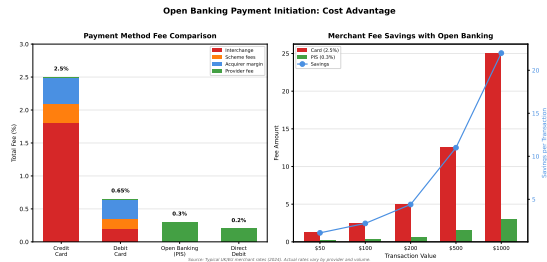


Users link accounts once via OAuth—apps then receive ongoing access without storing credentials.

# Payment Initiation Benefits

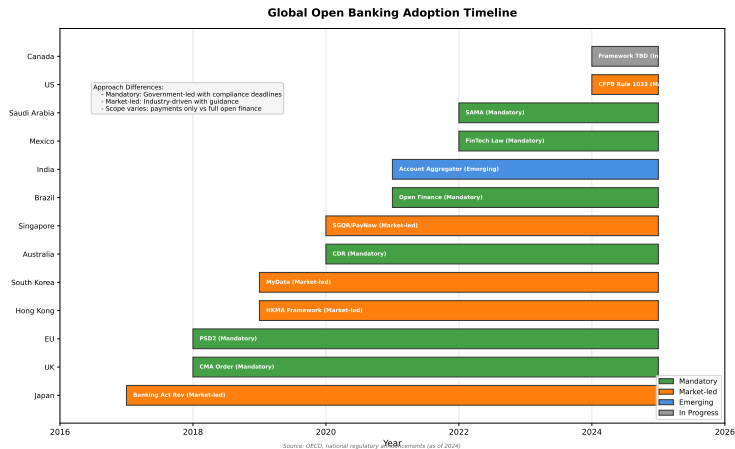
## vs Card Payments

- Lower fees (0.1% vs 1.5%)
- Faster settlement
- No chargebacks
- Direct bank transfer



PIS fees are 10-15x lower than card fees (0.1% vs 1.5%)—no chargebacks is a merchant advantage.

# Global Open Banking Adoption



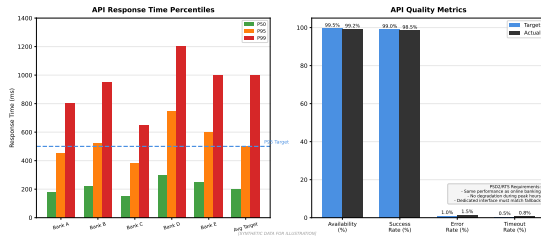
**EU/UK lead with mandatory frameworks—Brazil, Australia, and Singapore follow with national standards.**

# API Performance Metrics

## UK Success Rates (2023)

- API uptime: 99.5%
- Response time: 1.2s avg
- 12M monthly API calls
- 8M active users

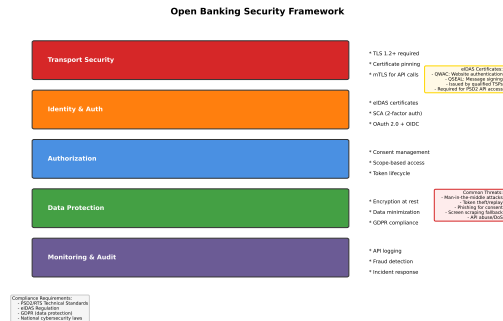
## Open Banking API Performance Standards



UK open banking APIs achieve 99.5% uptime with 1.2s average response—12M monthly API calls.

## Risk Mitigation

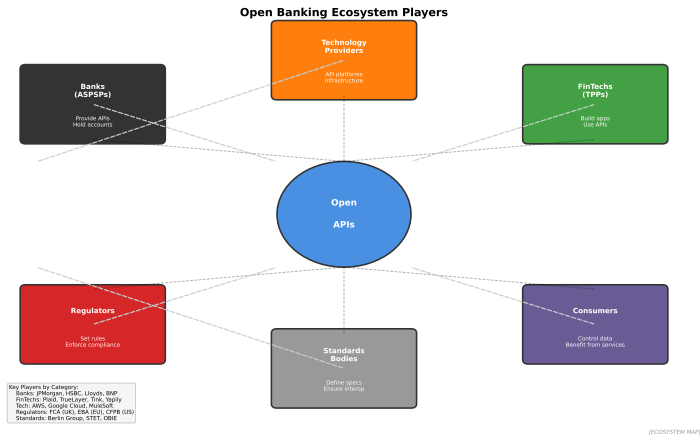
- API credential theft
- Man-in-the-middle attacks
- Excessive data access
- Fraud monitoring systems



Source: PSD2/RTS, EBA Guidelines on ICT and Security Risk Management

**API credential theft and man-in-the-middle attacks are primary risks—fraud monitoring is essential.**



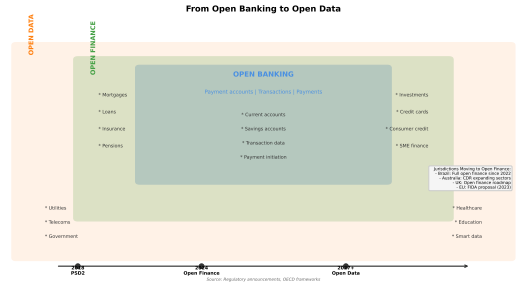


**Banks become platforms, not gatekeepers—revenue shifts from fees to API monetization and partnerships.**

# Future: Open Finance

## Beyond Banking

- Pension data sharing
- Insurance APIs
- Investment platforms
- Mortgage comparison



Open finance extends APIs to pensions, insurance, and investments—full financial data portability ahead.

## Key Takeaways

- **PSD2:** EU regulatory mandate for bank API access
- **Services:** AIS (aggregation) and PIS (payment initiation)
- **SCA:** Two-factor authentication requirement
- **Benefits:** Lower fees, faster payments, innovation
- **Future:** Expanding to open finance ecosystem

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Open banking enables customer-controlled data sharing—transforming banks from gatekeepers to platforms.