

Lesson 6: Digital Identity and Authentication

Module 1: FinTech Fundamentals

Digital Finance

Digital Identity Challenge

Identity Verification Problem

- 1.7B unbanked adults
- Lack of identity documents
- Fraud losses: \$5.8B (2023)
- Remote onboarding need

The Digital Identity Challenge

How do you prove who you are online?



- Synthetic identities
- Data & automation
- Deepfakes



- Identity theft
- Document fraud
- Account takeover



- Session hijacking
- Credential sharing
- Continuous auth

Identity Fraud Statistics (2023):
- \$4.9B lost to identity fraud globally
- 14% increase in ID theft
- 15% of adults affected by ID theft
- 80% increase in synthetic ID fraud

Stakeholders: Financial institutions | Governments | Consumers | Regulators

Digital Identity Solutions:
- Document verification (OCR, MIFD)
- Biometrics (Fingerprints, FERPs)
- Licensee detection
- Knowledge-based verification (Digital KYC, DPKY)
- Behavioral analytics

Source: Javelin Strategy, FTC Consumer Sentinel Network (2023)

KYC Regulatory Requirements

Know Your Customer (KYC) Framework

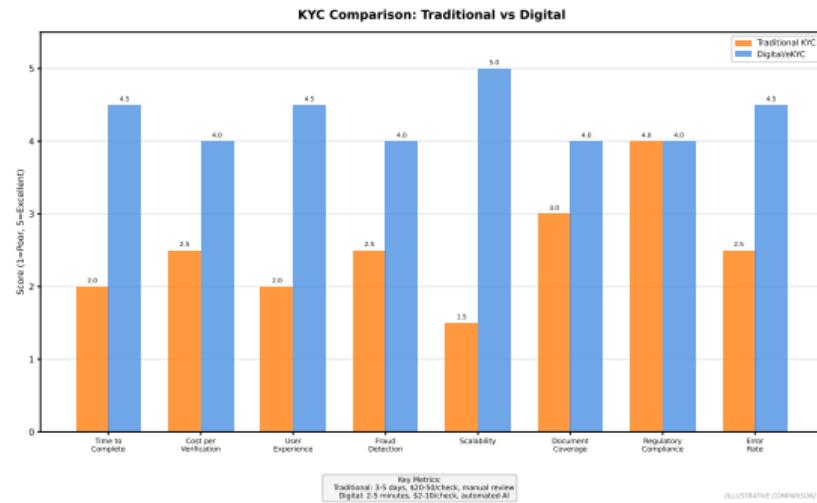


Source: FATF Guidelines, AML regulatory frameworks

Traditional vs Digital KYC

Process Comparison

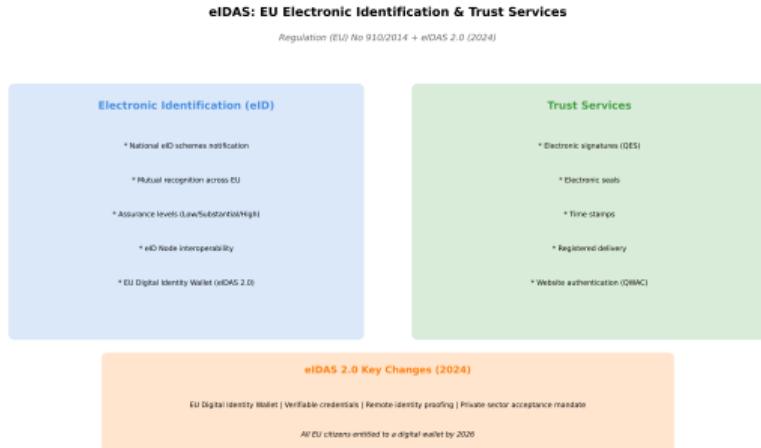
- Traditional: 7-14 days
- Digital: 5-10 minutes
- Cost: \$60 vs \$5
- Drop-off: 40% vs 15%

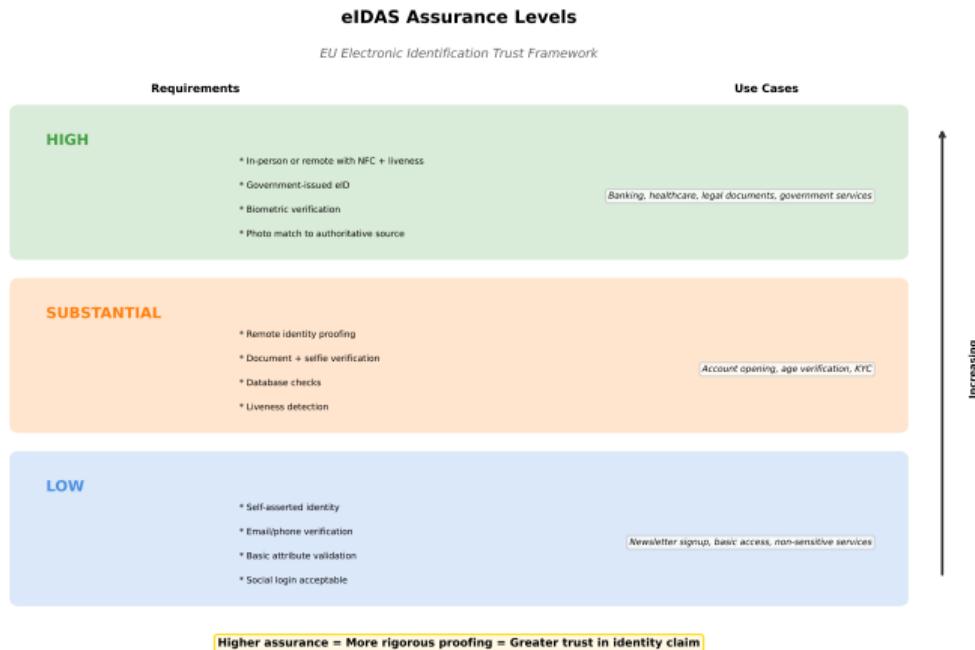


eIDAS Framework

EU Digital Identity

- Electronic ID recognition
- Trust services regulation
- Cross-border validity
- Three assurance levels

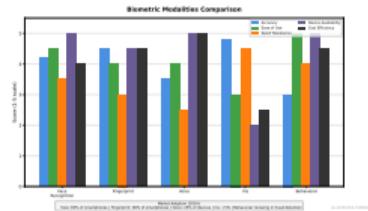




Source: EU Regulation 910/2014, Implementing Regulation 2015/1502

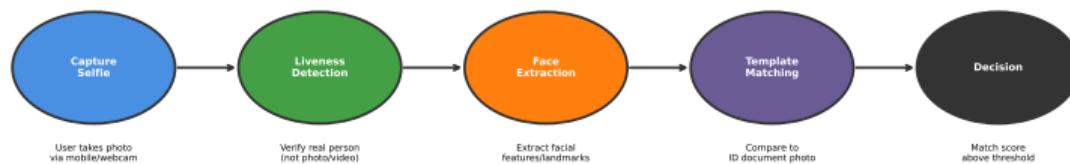
Modalities

- Fingerprint: 99.8% accuracy
- Face recognition: 99.5%
- Iris scan: 99.99%
- Voice: 95% accuracy



Facial Recognition Flow

Facial Recognition Verification Flow



Liveness Detection Methods:
- Active: Ask user to blink, smile, turn
- Passive: Analyze texture, depth, motion
- 3D: Structured light, stereo vision
- Challenge-response: Random prompts

Match Metrics:
- FAR: False Accept Rate
- FRR: False Reject Rate
- Typical threshold: 99% confidence
- Industry standard: FAR < 0.1%

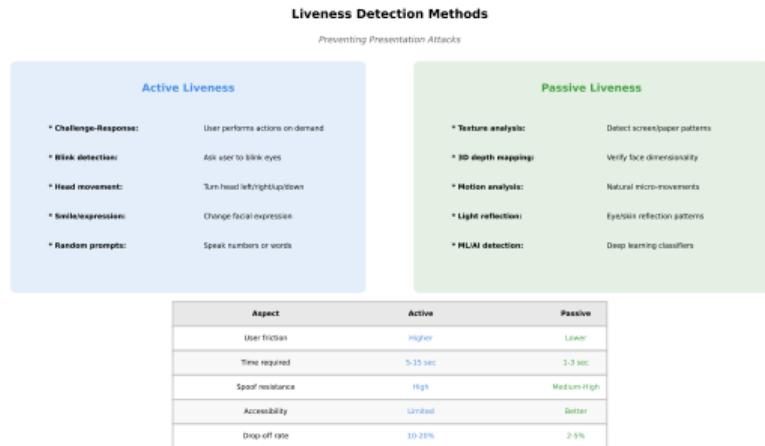
Spoofing Attacks: Photo attacks | Video replay | 3D masks | Deepfakes

{CONCEPTUAL PROCESS FLOW}

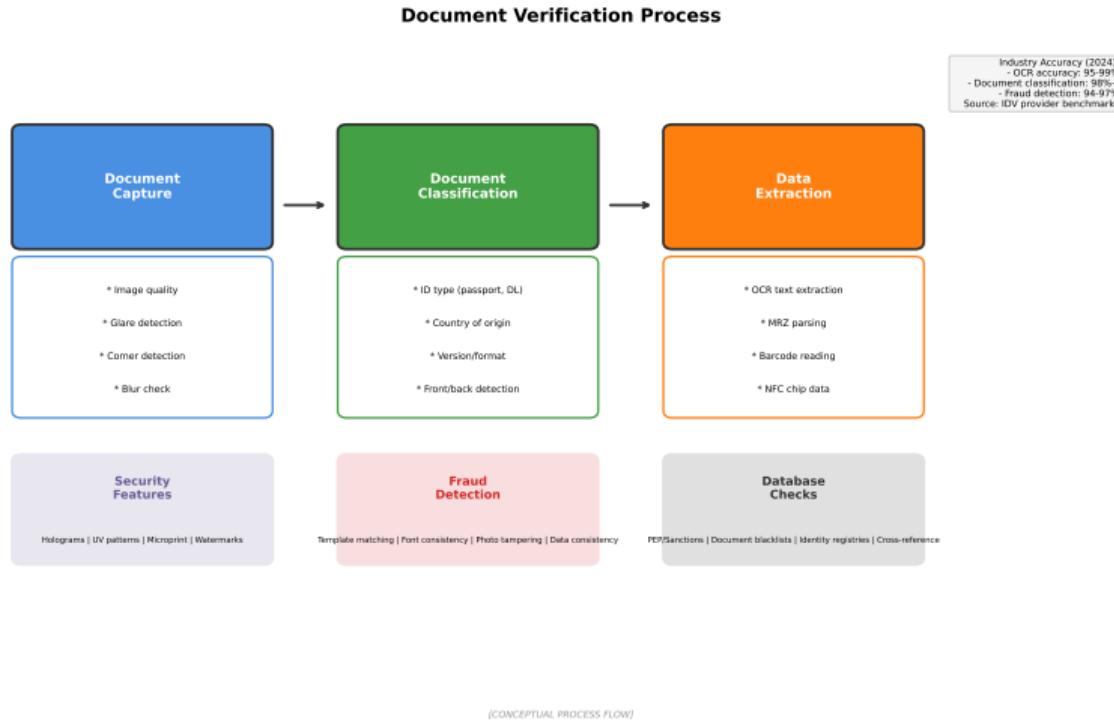
Liveness Detection

Anti-Spoofing

- Active: User actions
- Passive: Texture analysis
- 3D depth sensing
- Challenge-response



Document Verification Technology



OCR and NFC Chip Reading

Automated Extraction

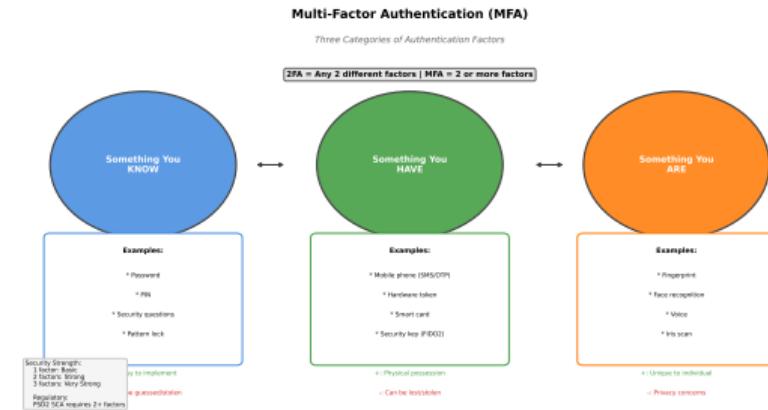
- Optical character recognition
- Machine-readable zone (MRZ)
- NFC chip data (ePassports)
- Security features check



Multi-Factor Authentication (MFA)

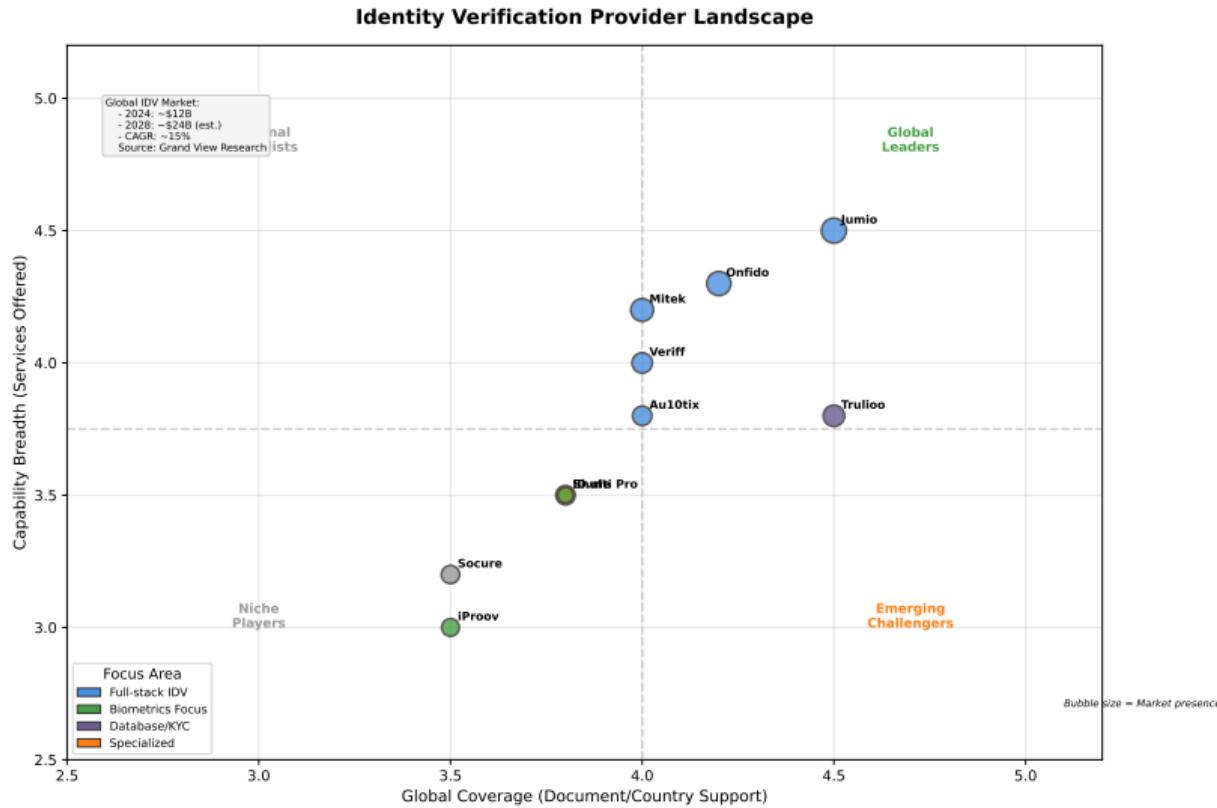
Authentication Factors

- Knowledge: Password/PIN
- Possession: OTP token
- Inherence: Biometric
- Reduces fraud 99.9%



Source: NIST SP 800-63B Digital Identity Guidelines

Identity Verification Providers



Jumio Case Study

AI-Powered KYC

- 1B+ verifications
- 5 minute verification
- 95% automation rate
- 200+ countries

Identity Verification Workflow (Jumio Example)



Jumio Performance (2024)
- 100+ document types
- 5,000+ document types
- 100+ countries supported
- 99.9+ pass-through rate
Source: Jumio product data

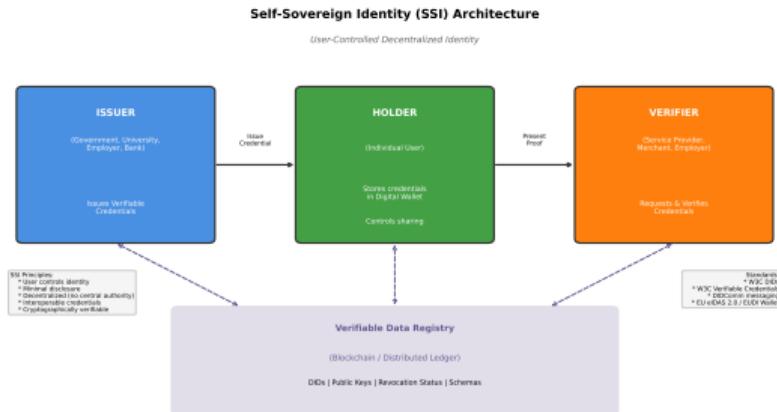
Output Options:
- Real-time response
- Batch API response
- File download
- Credit Inquiries

Source: Jumio product documentation (2024)

Self-Sovereign Identity (SSI)

Decentralized Model

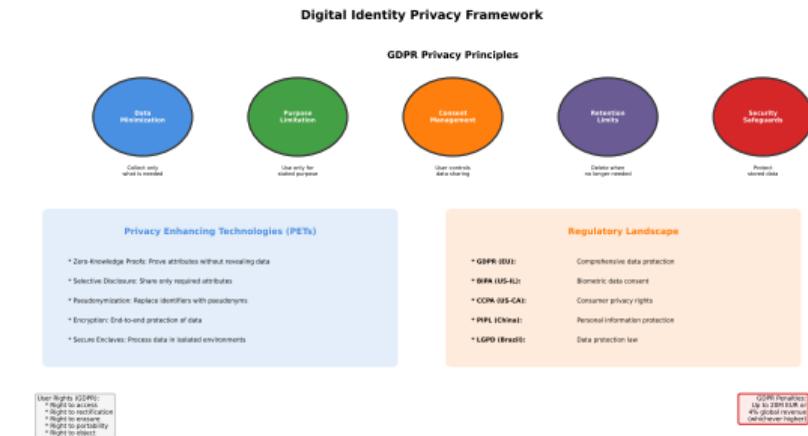
- User controls credentials
- Blockchain-based
- Verifiable credentials
- Privacy-preserving



Privacy Concerns

Data Protection

- GDPR compliance
- Biometric template storage
- Data minimization
- Right to erasure



Source: GDPR (EU 2016/679), NIST Privacy Framework

Global Identity Programs

Global Digital Identity Landscape

National Digital ID Systems by Region (2024)

Europe

- * eIDAS/EUDI Wallet (EU)
- * BankID (Nordics)
- * Itsme (Belgium)

70%+ adult population

Asia-Pacific

- * Aadhaar (India) - 1.3B
- * MyKad (Malaysia)
- * SingPass (Singapore)

Highest biometric coverage

Americas

- * Login.gov (US-partial)
- * Gov.br (Brazil)
- * Digital ID (Canada-pilot)

Fragmented adoption

Africa

- * NIMC (Nigeria)
- * Smart ID (South Africa)
- * Huduma Namba (Kenya)

Growing mobile-first

Middle East

- * UAE Pass
- * Absher (Saudi)
- * Smart Qatar

High gov adoption

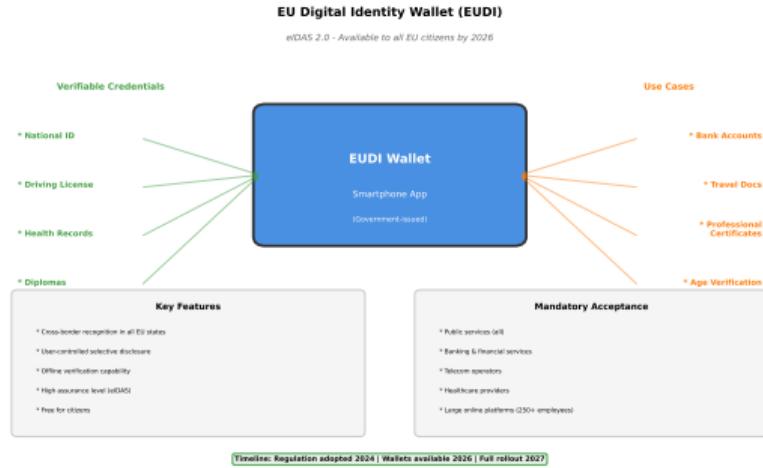
Global Statistics (2024):
- 5B+ people have digital ID
- 1B+ still lack legal identity
- \$30B+ market by 2028
Source: World Bank ID4D, McKinsey

Source: World Bank ID4D Global Dataset 2024, Regional government sources

Future: Digital Wallets

EU Digital Identity Wallet

- eIDAS 2.0 mandate
- 2026 rollout target
- Universal EU acceptance
- Private sector integration



- **KYC:** Digital verification reduces cost 90% and time 95%
- **eIDAS:** EU framework for cross-border identity
- **Biometrics:** Face + liveness detection standard approach
- **MFA:** Multi-factor prevents 99.9% of fraud
- **Future:** Self-sovereign identity and digital wallets