Gen™

An Overview of Decentralized Identity

Why it is the key to restoring trust on the Internet

WA House of Representatives - ICEV Committee Work Session

13 January 2023

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Director of Trust Services, Gen Digital



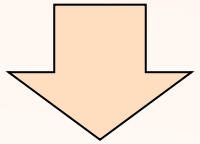
A little background

- Director of Trust Services, Gen Digital
- Formerly Chief Trust Officer, Evernym
- Co-Author, W3C Decentralized Identifiers (DID) Spec
- Co-Author, *Self-Sovereign Identity* (Manning, 2021)
- Co-Founder / Steering Member, Trust over IP Foundation
- Chair, ToIP Governance Stack WG
- 25+ years in Internet identity, security, privacy, trust
- 20+ years in identity standards

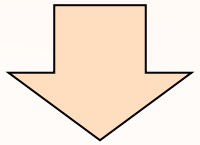


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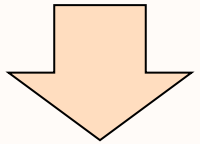
Blockchain Identity



Self-Sovereign Identity



Decentralized Identity



Decentralized Digital Trust

The three major eras of digital identity

Centralized	Federated	Decentralized
• X.500 • SSL • TLS • HTTPS	• SAML • OpenID • OAuth • UMA	• Decentralized Identifiers (DIDs) • Verifiable Credentials





















What is driving adoption? Headlines like these.



We already have a solution to this

…in the physical world

Paper or plastic credentials that are:

- Issued from a trusted source
- Tamper-resistant
- Secure
- Private
- Portable
- Reusable
- Standardized



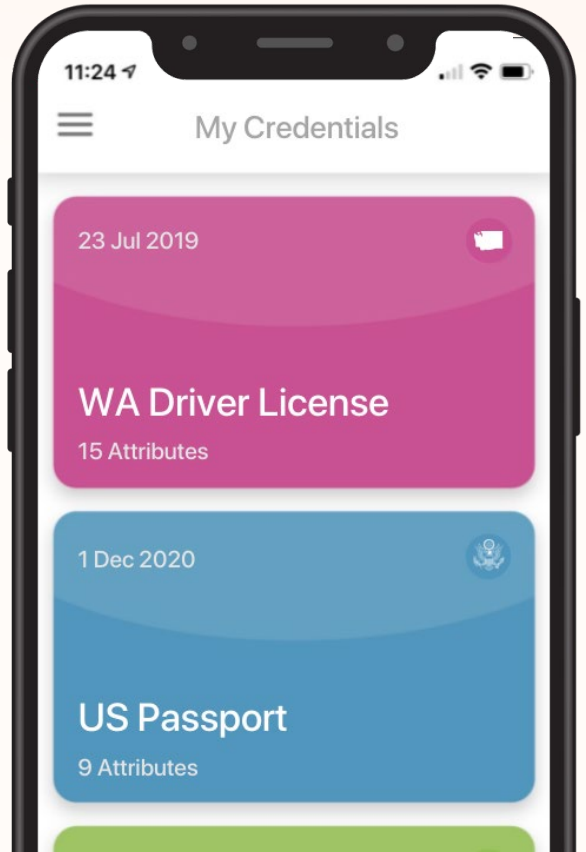
You hold the data (credential) and can show it to anyone, anywhere – on your terms.

Decentralized identity takes this same approach and makes it digital

Like your physical passport or driving license, **verifiable credentials** are under your control, stored in your own personal **digital wallet** , and can be shown to anyone, anywhere.

Once shared, they can be immediately verified by the receiving party, who can check:

1. Who issued the credential?
2. To whom was it issued?
3. Has it been tampered with?
4. Has it been revoked?



Decentralized identity is gaining major momentum around the world



Bonifii (US)

Trusted authentication and secure messaging for credit unions



FCA (UK)

Smarter KYC/AML for banks and fintechs



IATA (Global)

Verifiable health and travel records for global travel



NHS (UK)

Staff ‘passports’ for streamlined access control

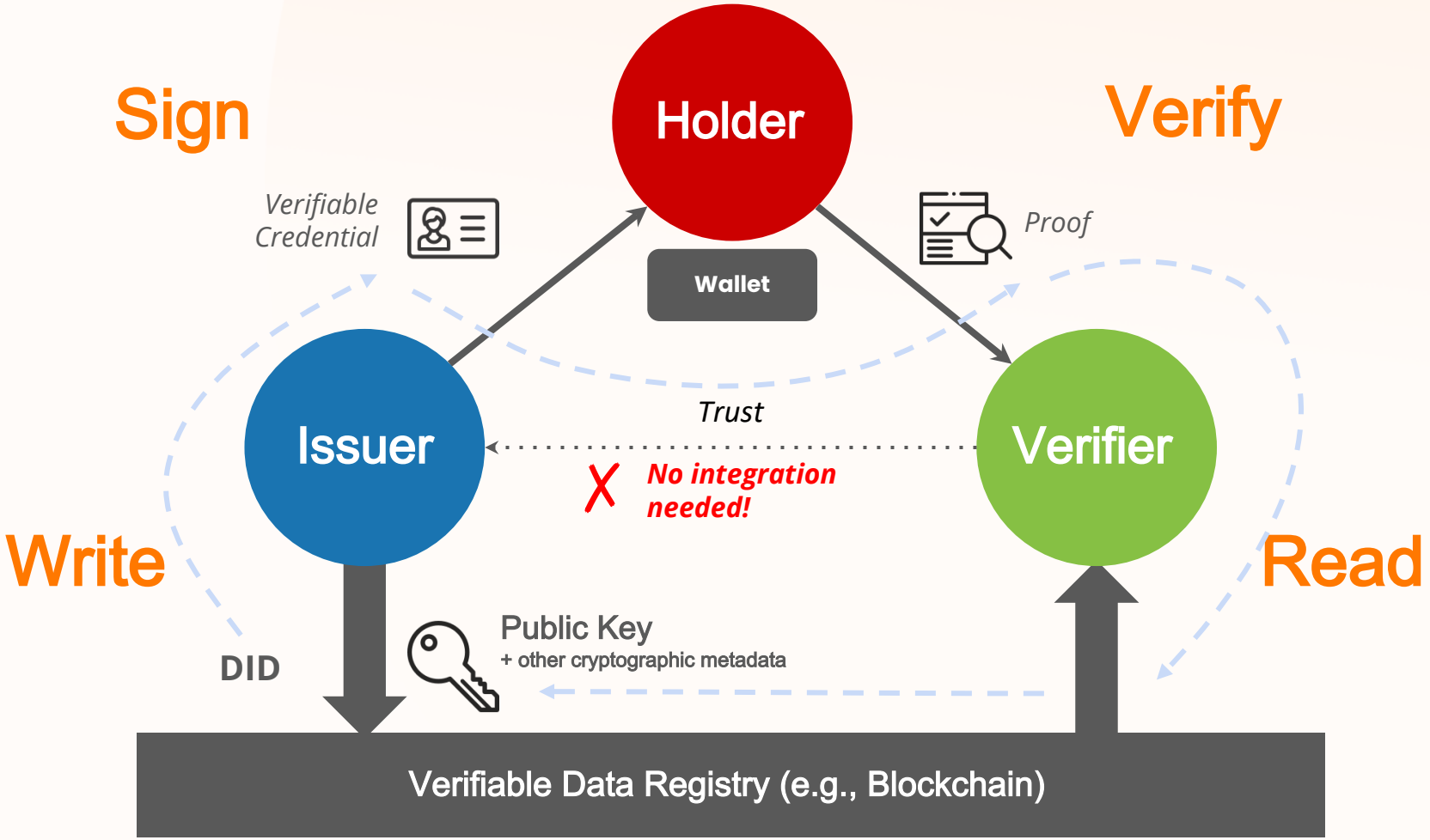


EU Digital Wallet

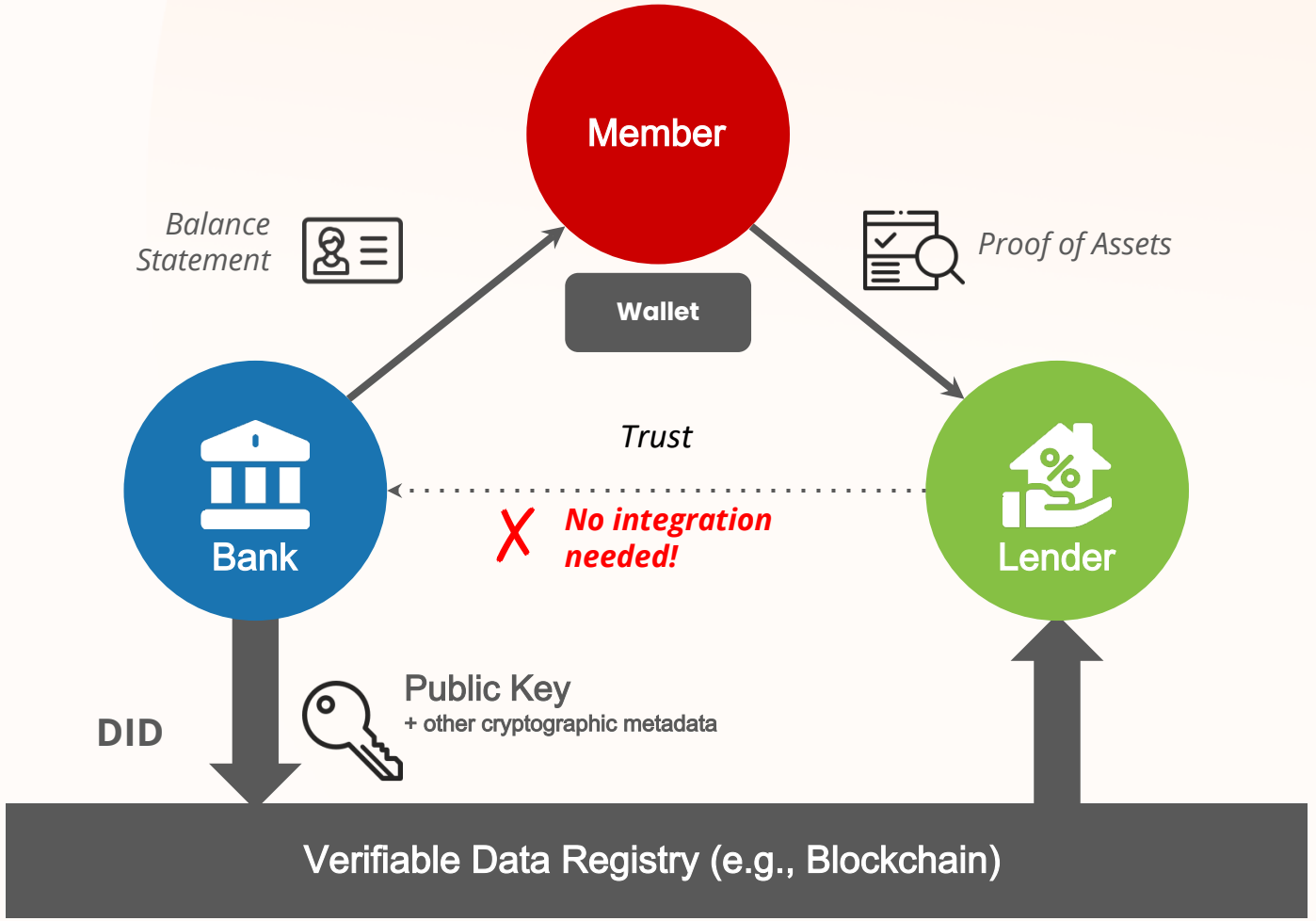
Reusable identity for all Europeans

How decentralized identity works: The trust triangle

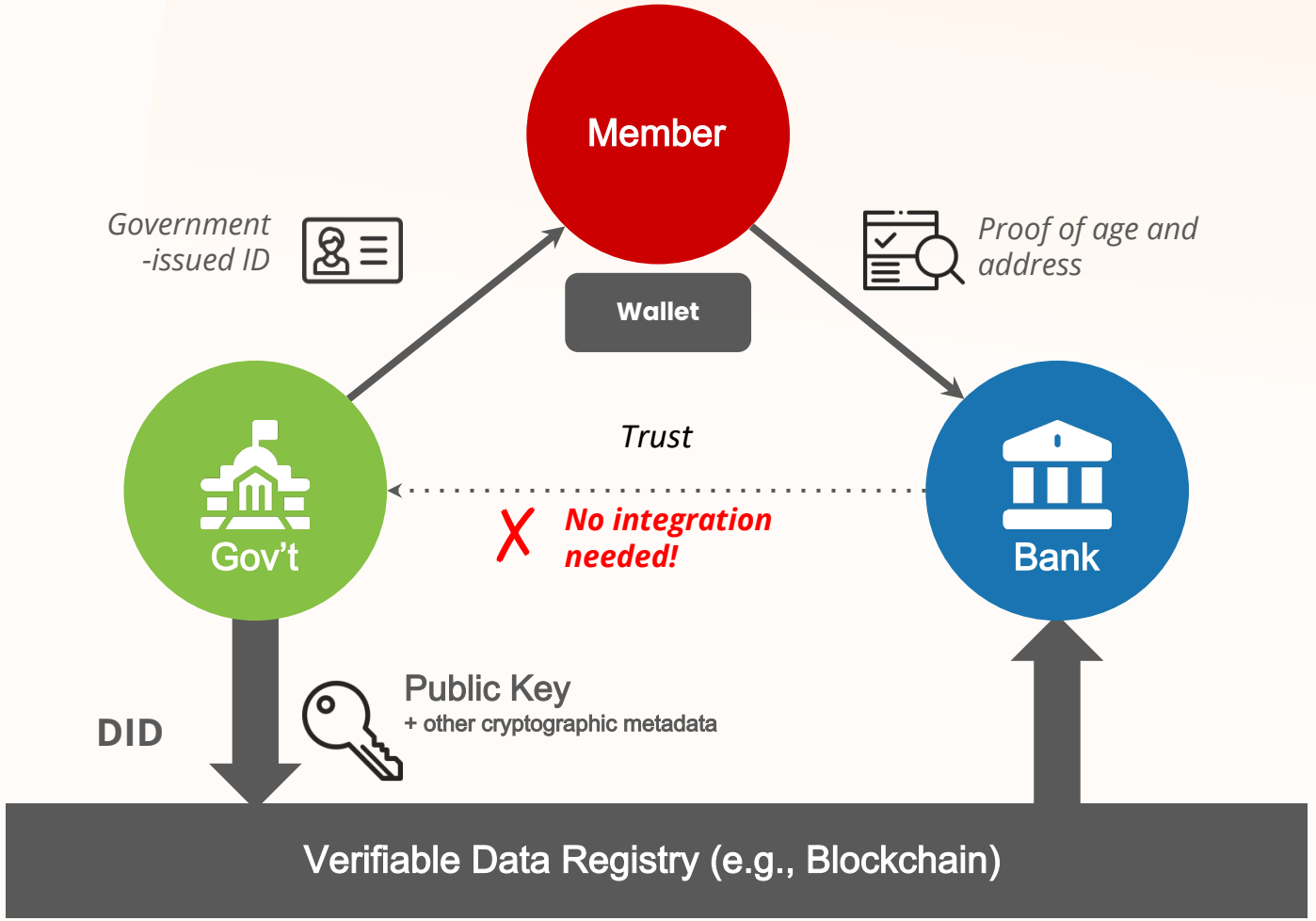
The trust triangle



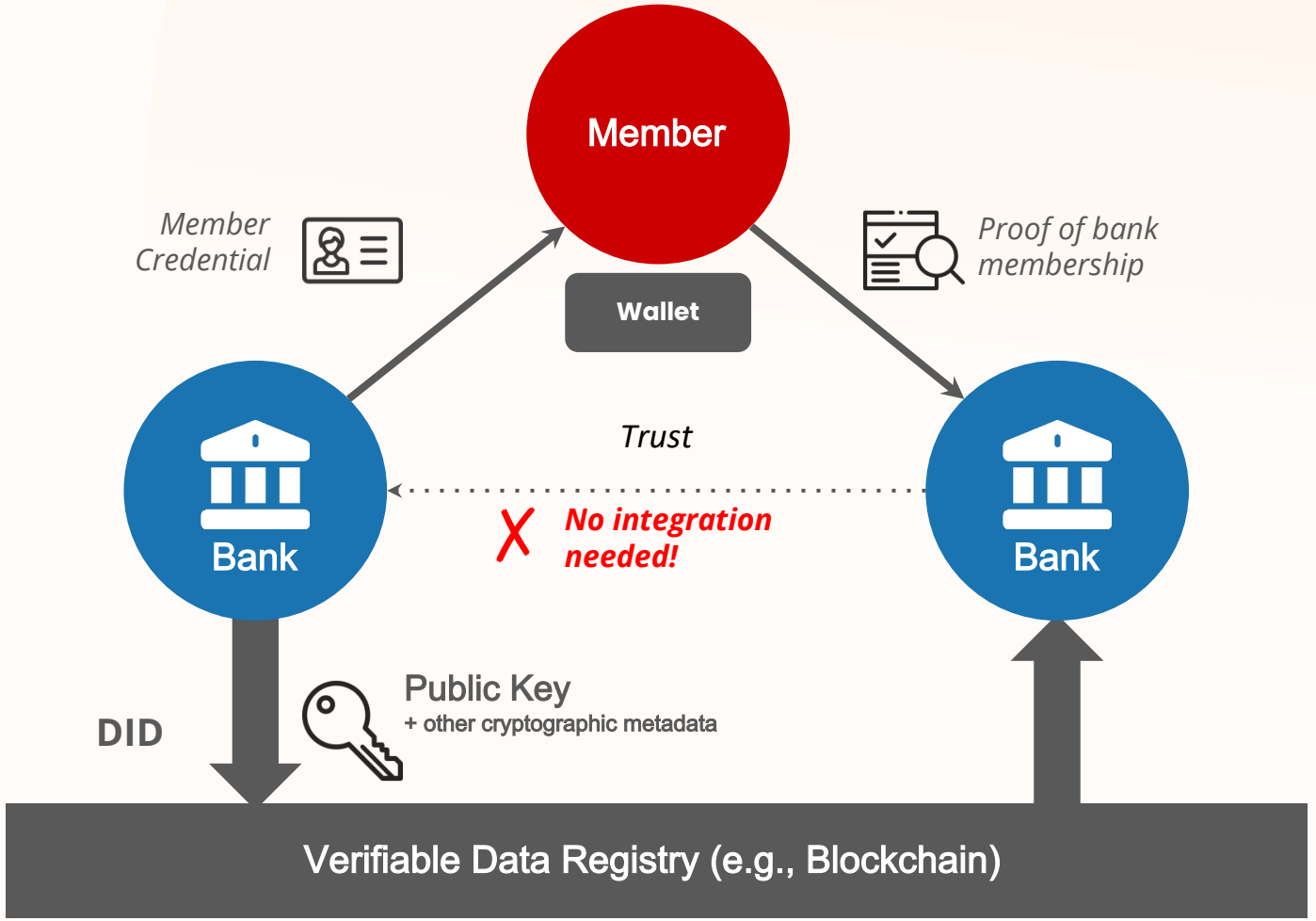
Example: a bank can be an issuer



A bank can be a verifier

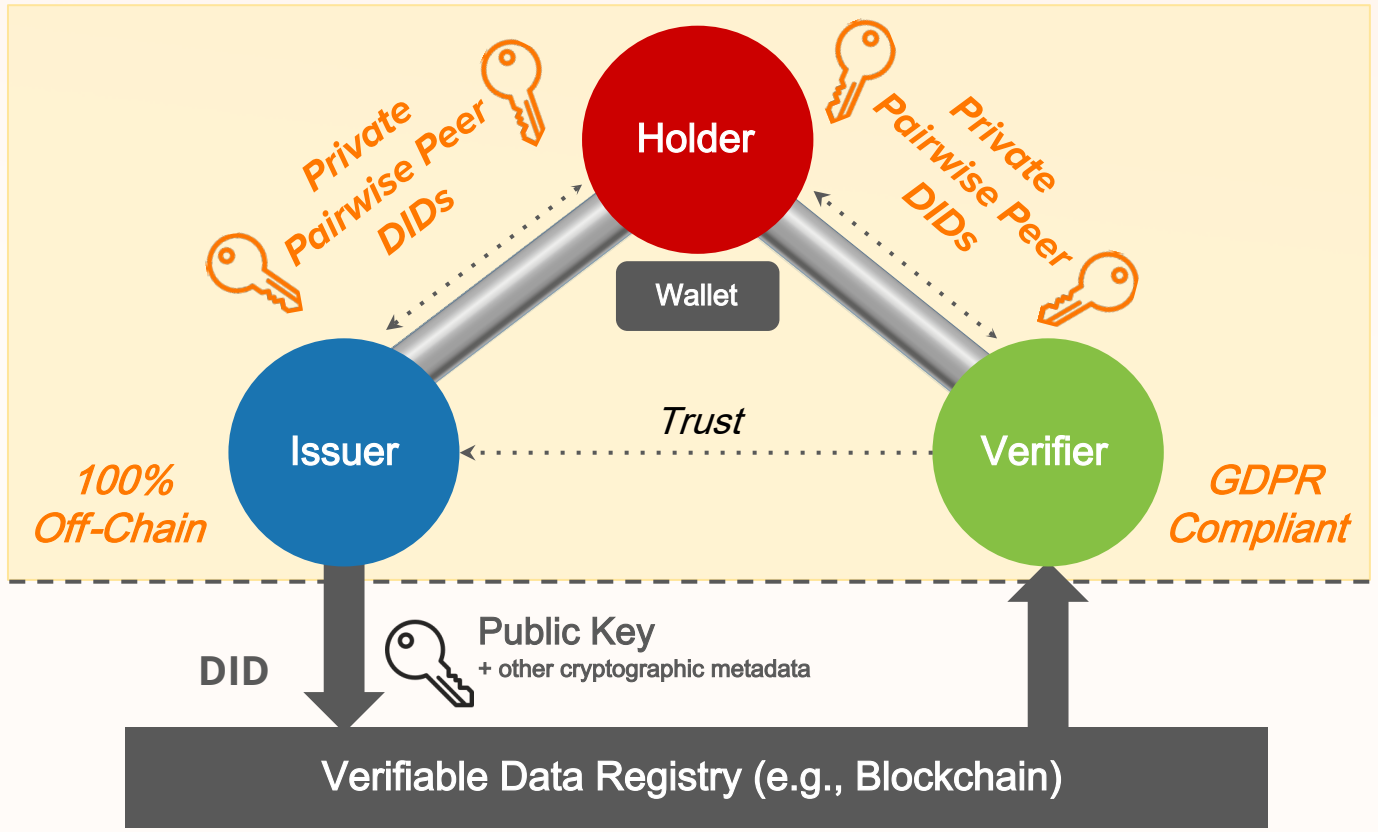


For some credentials, a bank will be both



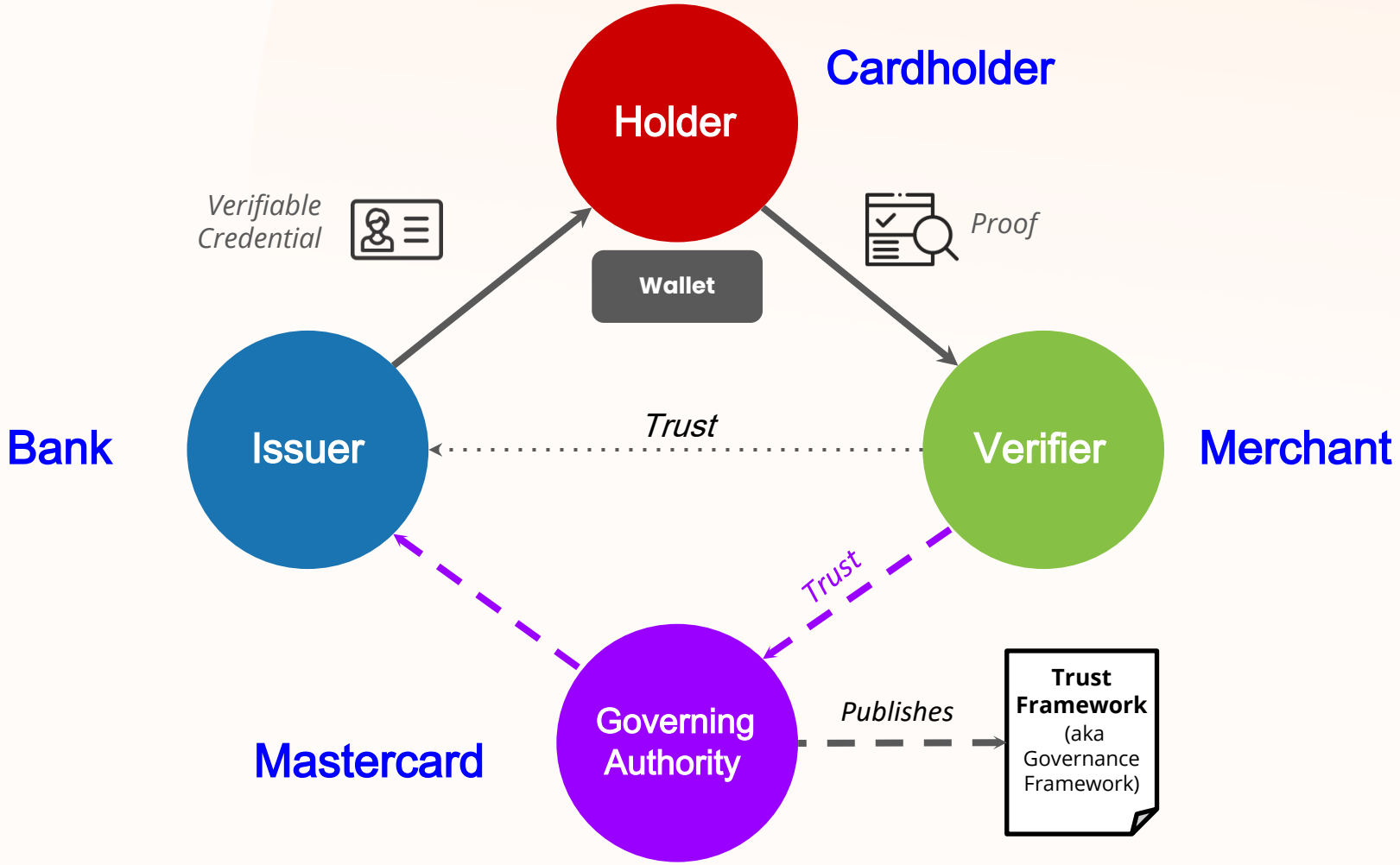
Verifiable credentials can deliver Privacy by Design at Internet scale

- **All communication channels are private and encrypted** , using pairwise peer DIDs
- **All data is stored off -chain**, securely inside of the user's digital wallet
- **Fully GDPR compliant**, with consent-based data sharing and data minimization through zero-knowledge proofs



How decentralized identity scales: The governance diamond

The governance diamond





Defining a complete architecture for Internet-scale digital trust that combines cryptographic assurance at the machine layers with human accountability at the business, legal, and social layers.

ToIP Technology Stack

ToIP Governance Stack

Layer 4

Application Ecosystems

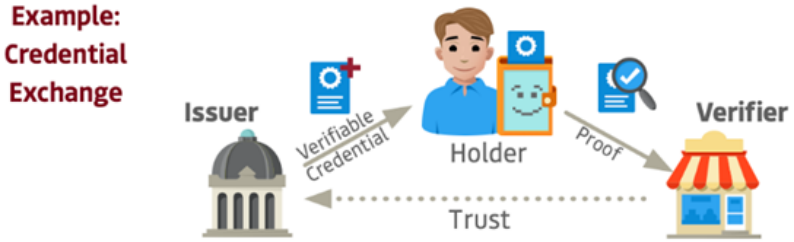


Ecosystem Governance Frameworks



Layer 3

Trust Task Protocols

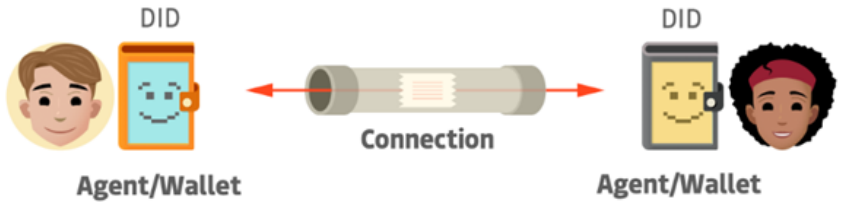


Trust Task Governance Frameworks



Layer 2

Peer-to-Peer Communication



Agent/Wallet Governance Frameworks



Layer 1

Public Utilities



Utility Governance Frameworks

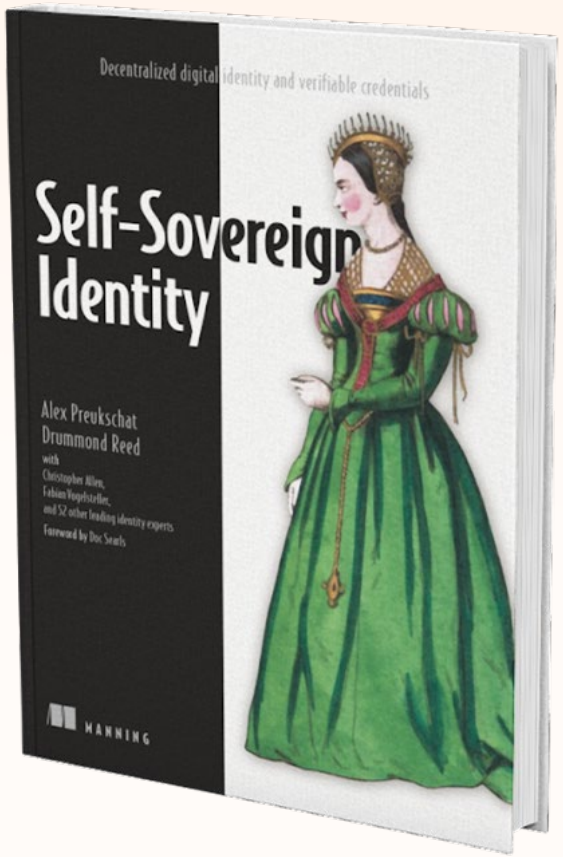


Examples of ecosystem governance for decentralized identity & verifiable credentials

1. GLEIF vLEI (verifiable credentials for LEI) Ecosystem Governance Framework
   https://www.gleif.org/en/vlei/introducing-the-verifiable-lei-vlei
2. EU Digital Identity Wallet Reference Framework
   https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-digital-identity_en
3. Province of British Columbia Digital Trust Services
   https://digital.gov.bc.ca/digital-trust/governance-overview/
4. California Senate Bill 786
   https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB786

If you'd like to learn more…

- Self-Sovereign Identity (Manning Publications, 2021): https://www.manning.com/books/self-sovereign-identity
- Evernym webinar series:www.evernym.com/webinars/
- Blog post: The Three Pillars of SSI
- Blog post: A Gentle Introduction to Verifiable Credentials
- Trust over IP:www.trustoverip.org
- ToIP Governance Framework Specifications: https://trustoverip.org/news/2022/02/01/the-toip-foundation-releases-its-first-official-governance-specifications/



Questions?