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22-23 May, 2025

Rabat Smart City, Morocco

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Shaping Sustainable,
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Smart Cities

Towards Human-Centric Smart City Services through Decentralized Identity Management

Stefan Wiedemann

Senior Software Engineer @ FICODES & SEAMWARE

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Expectations

- Citizens:
 - Digital insights into the work of the administration
 - Municipal services like resident registration, civil registry, building permits, school registration etc.
- Visitors:
 - Touristic information
 - Offers of assistance, f.e. in case of travel issues, accommodation
- Businesses:
 - Legal and regulatory information
 - Legal services like registrations or tax



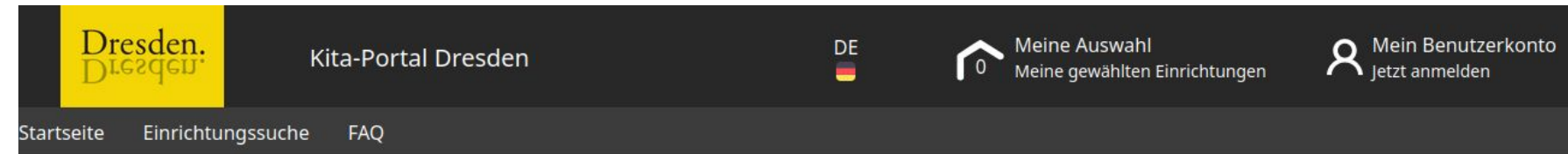
All images are generated using AI

Challenges

- Employees:
 - Lack of qualified employees
 - Distracted by unrelated work
 - Exhausted by repetitive, automatable work
- Customers:
 - Respond quickly
 - Respond in the correct language
 - Accommodate for the needs of disabled people
- Legal:
 - Ensure identity and permission of service users
 - Respect data privacy regulations (like GDPR)



Status quo



- Username & Password
 - Individual passwords to be remembered
 - Security risks by weak and repeated passwords
 - SSO-Providers as Data Sinks
- Registration:
 - Time consuming
 - Increased entry barrier for customers
 - Ensure correctness, error prone
- Digital solutions:
 - Often centralized and reliant on central providers
 - Require additional devices and documents

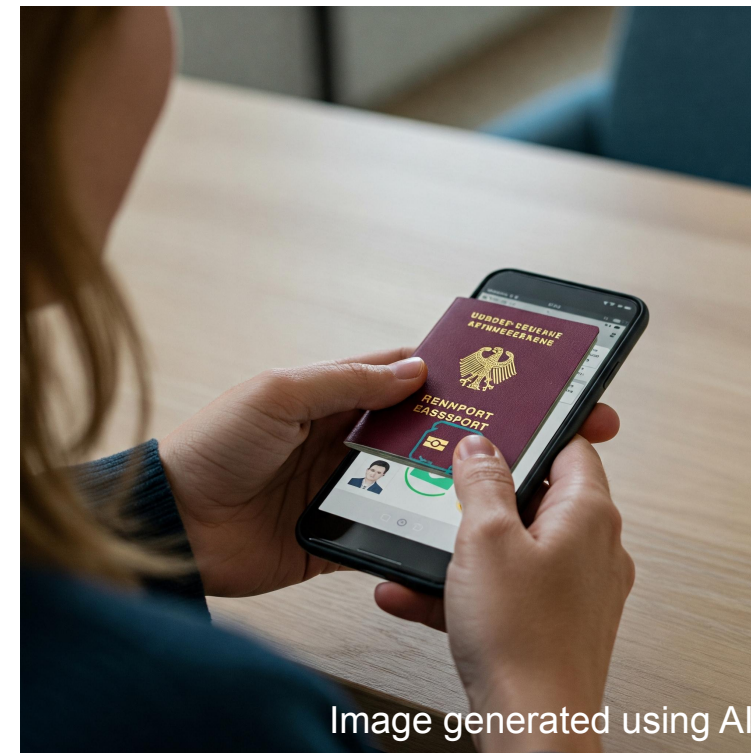
The image shows a login form titled 'Anmelden'. It contains two input fields: 'E-Mail' with the placeholder text 'E-Mail-Adresse eingeben' and 'Passwort' with the placeholder text 'Passwort eingeben'. To the right of the password field is an eye icon for toggling visibility. Below the password field is a link that says 'Passwort vergessen?'. A yellow button labeled 'Anmelden' is positioned below the input fields. At the bottom of the form, there is a text prompt 'Noch kein Benutzerkonto? Registrieren Sie sich jetzt.' and a dark grey button labeled 'Jetzt Registrieren'.

Image generated using AI

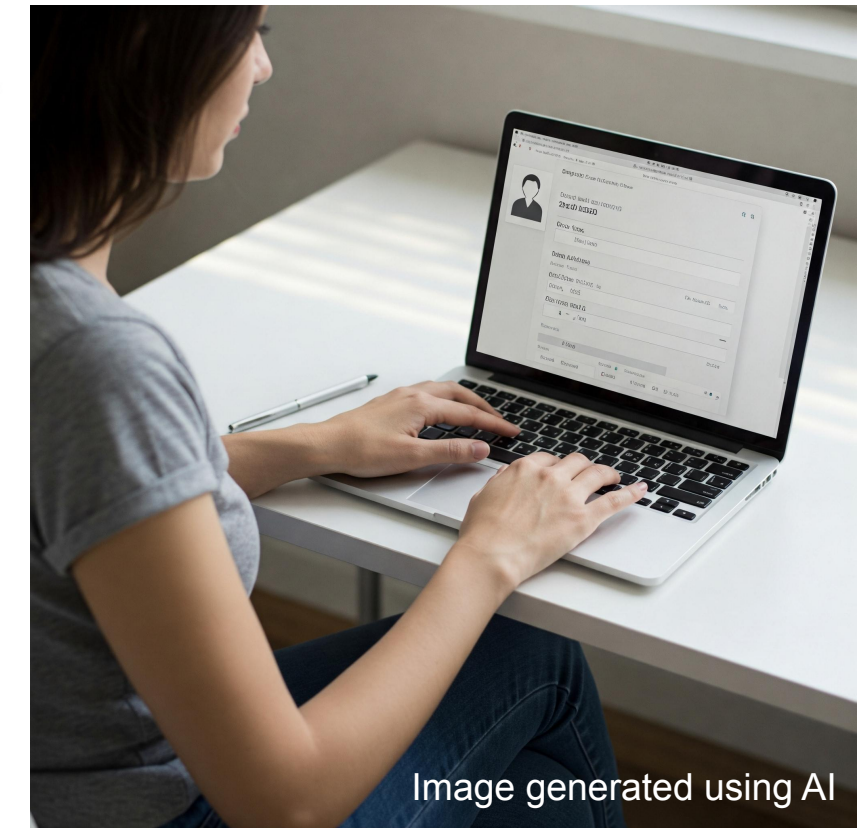


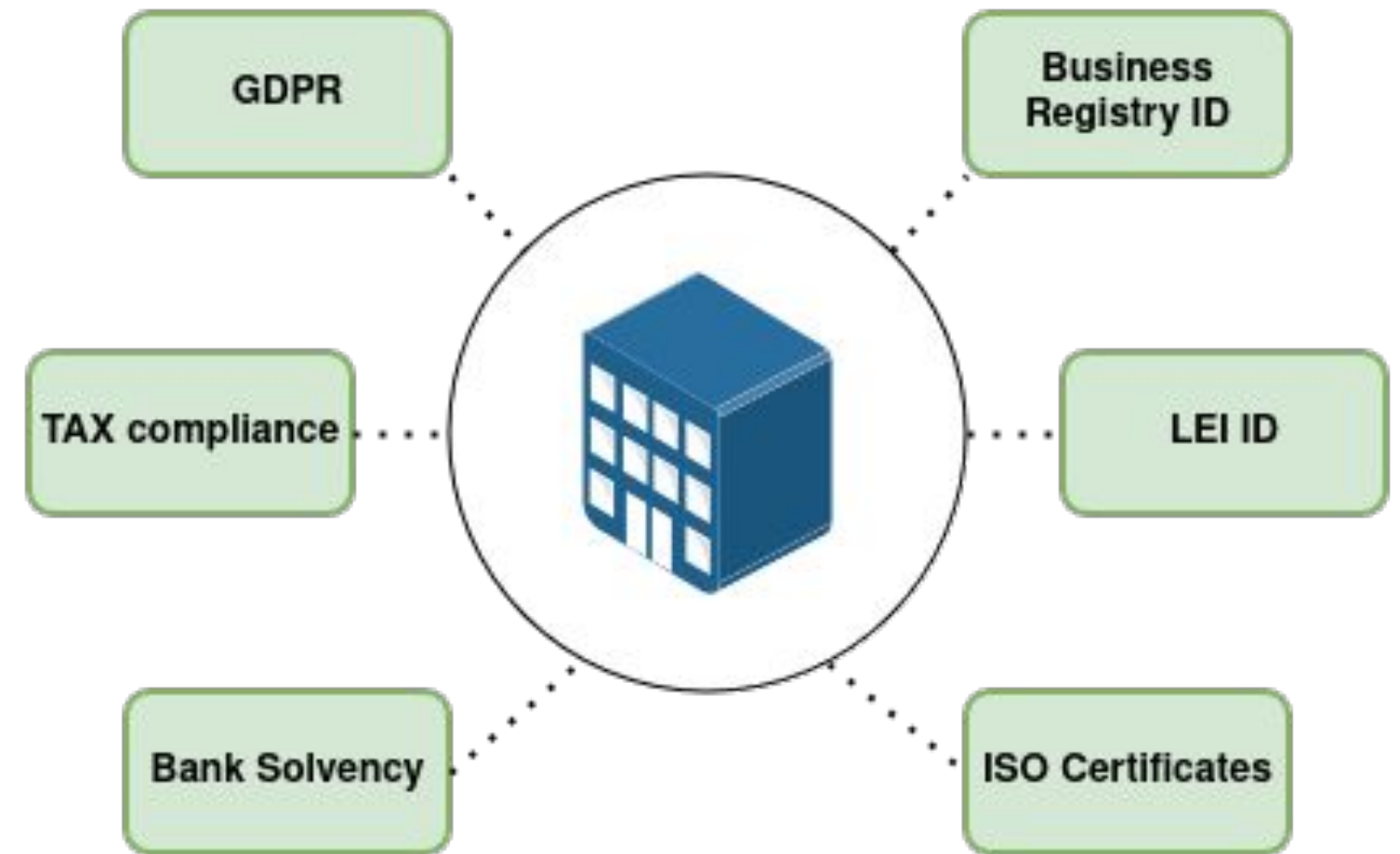
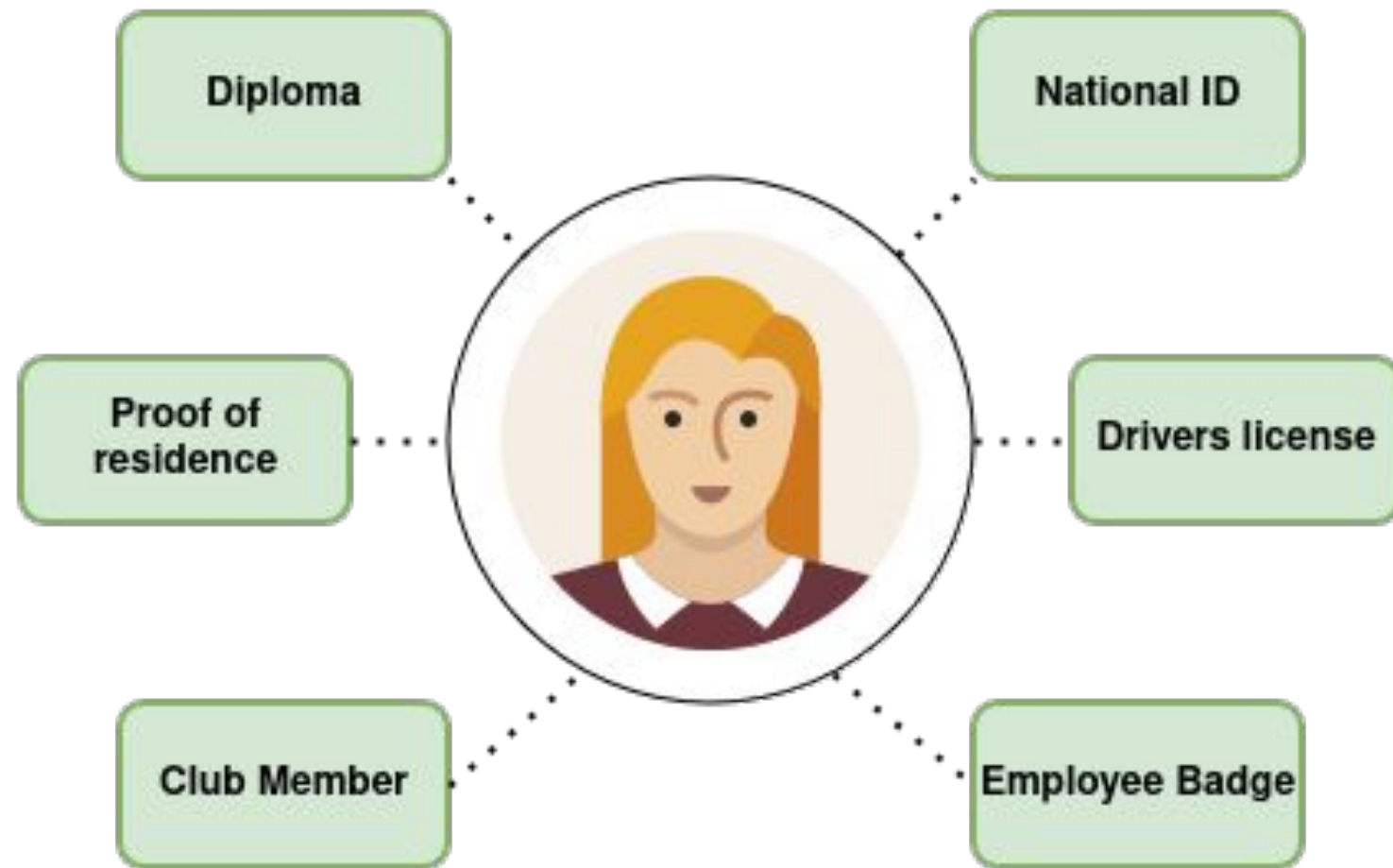
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Decentralized Identity

- Copy the good things of the physical world
- Augment it with digital powers
- Preserve the required properties
- Adapt to current legal frameworks, but stay prepared for the future

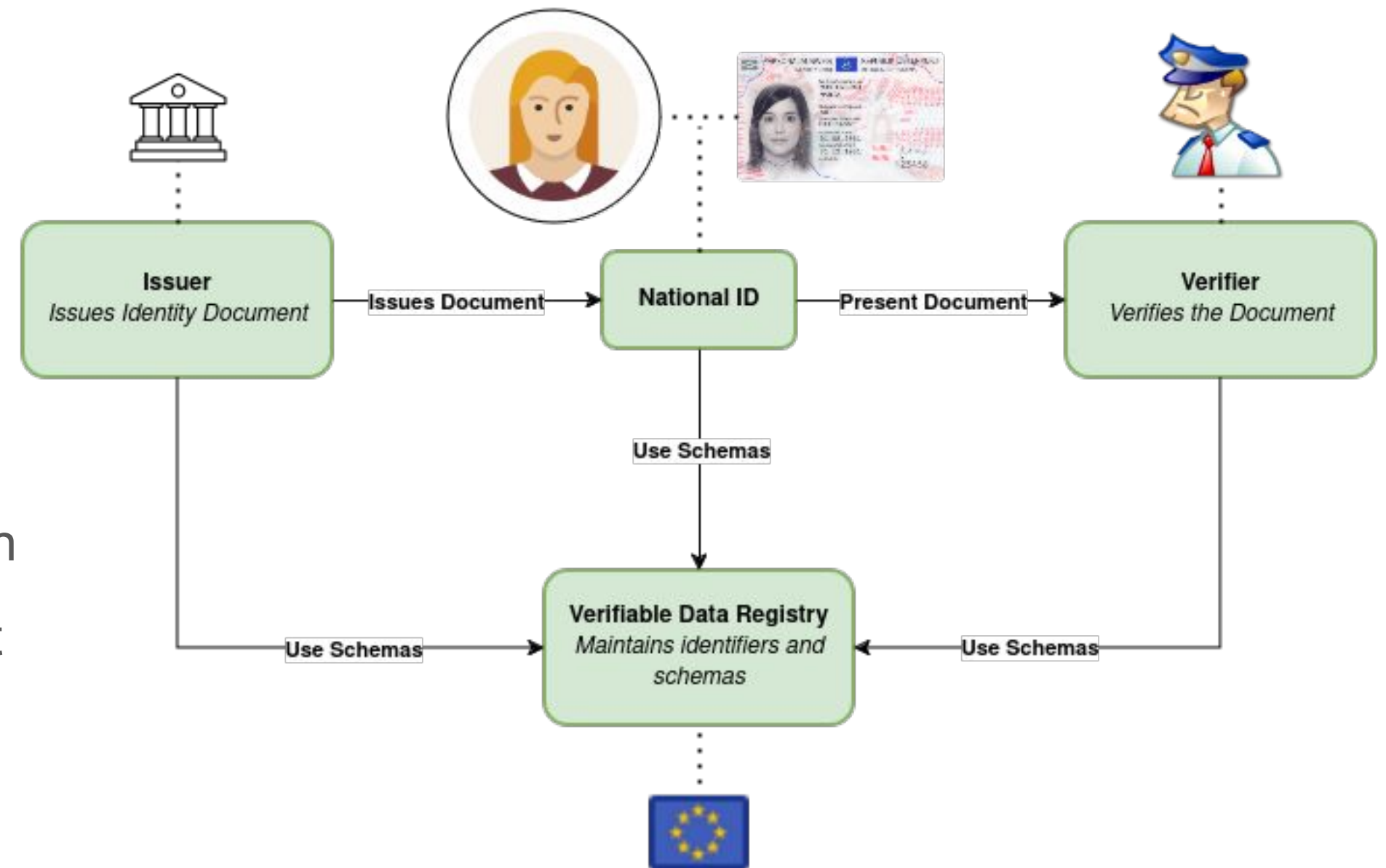


Identity of natural and legal persons



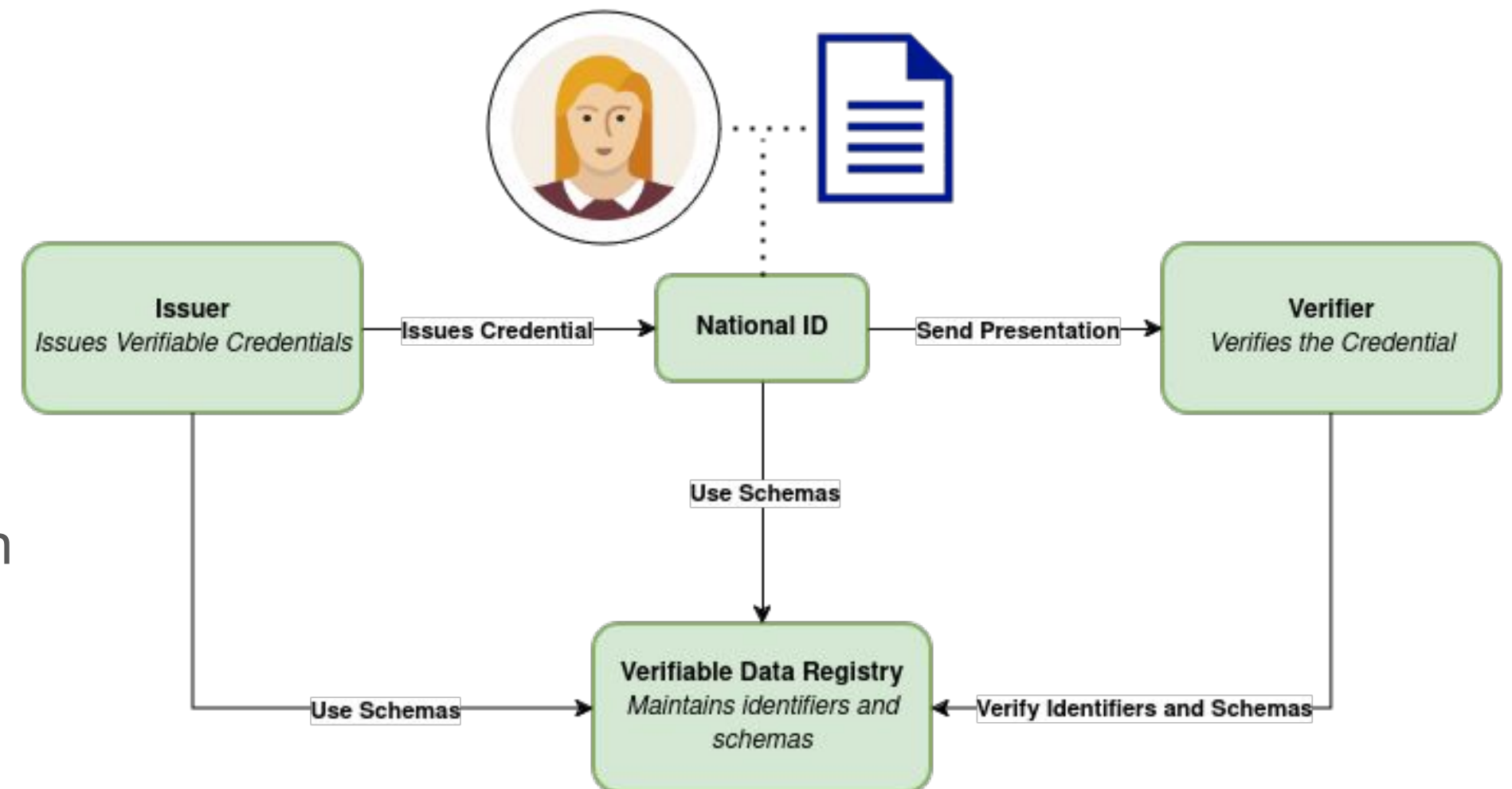
Authentication in the Real World

- Government registered at registry(EU)
- National ID is issued by the government to a citizen
- Follows commonly agreed schemas(defined by the EU)
- Is presented to an authority for authentication
- Verifies authenticity features and checks that its a registered Schema(“National ID”) and from a registered issuer



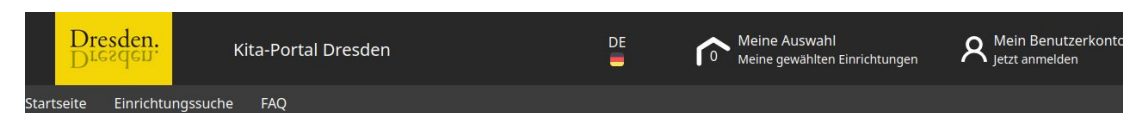
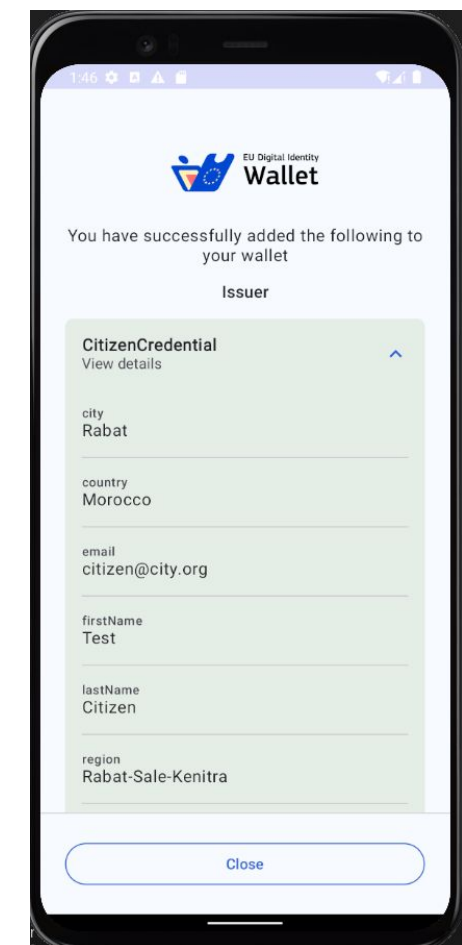
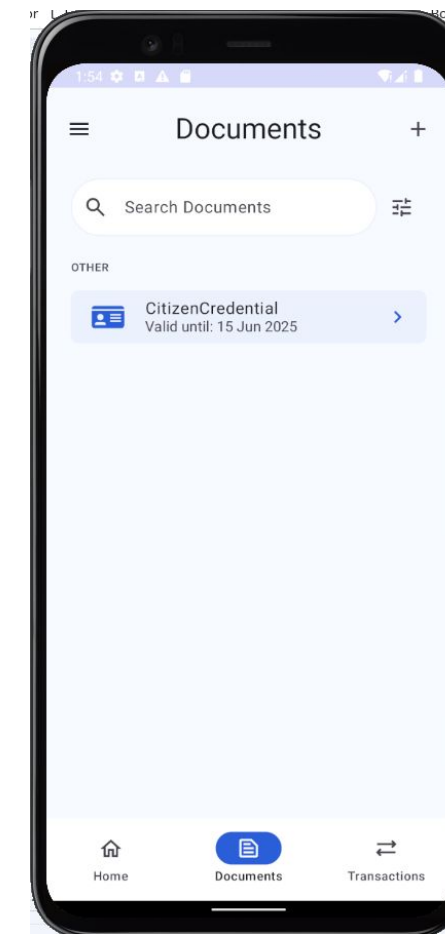
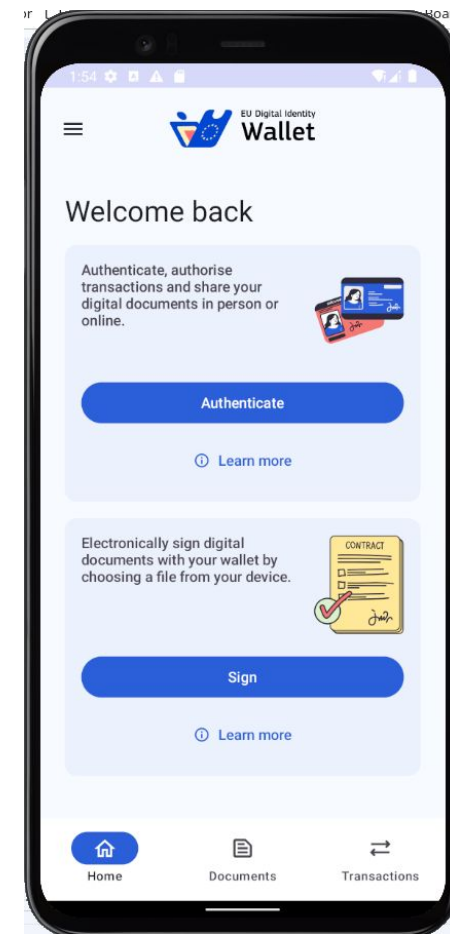
W3C Verifiable Credentials

- Issuer is registered at the Verifiable Data Registry
- Issuer issues Credential to the holder
- Holder presents the credential to the verifier
- Is presented to an authority for authentication
- Verifier verifies the signature, schema and checks that issuer and schema are registered at the Registry



Usage for authentication and authorization

- Verifiable Credentials issued to User by public authorities
- Format follows commonly agreed standards
- Stored and independently usable with the user wallet
- Independently verifiable by the Service Provider



Scan this QR code to authenticate with a mobile



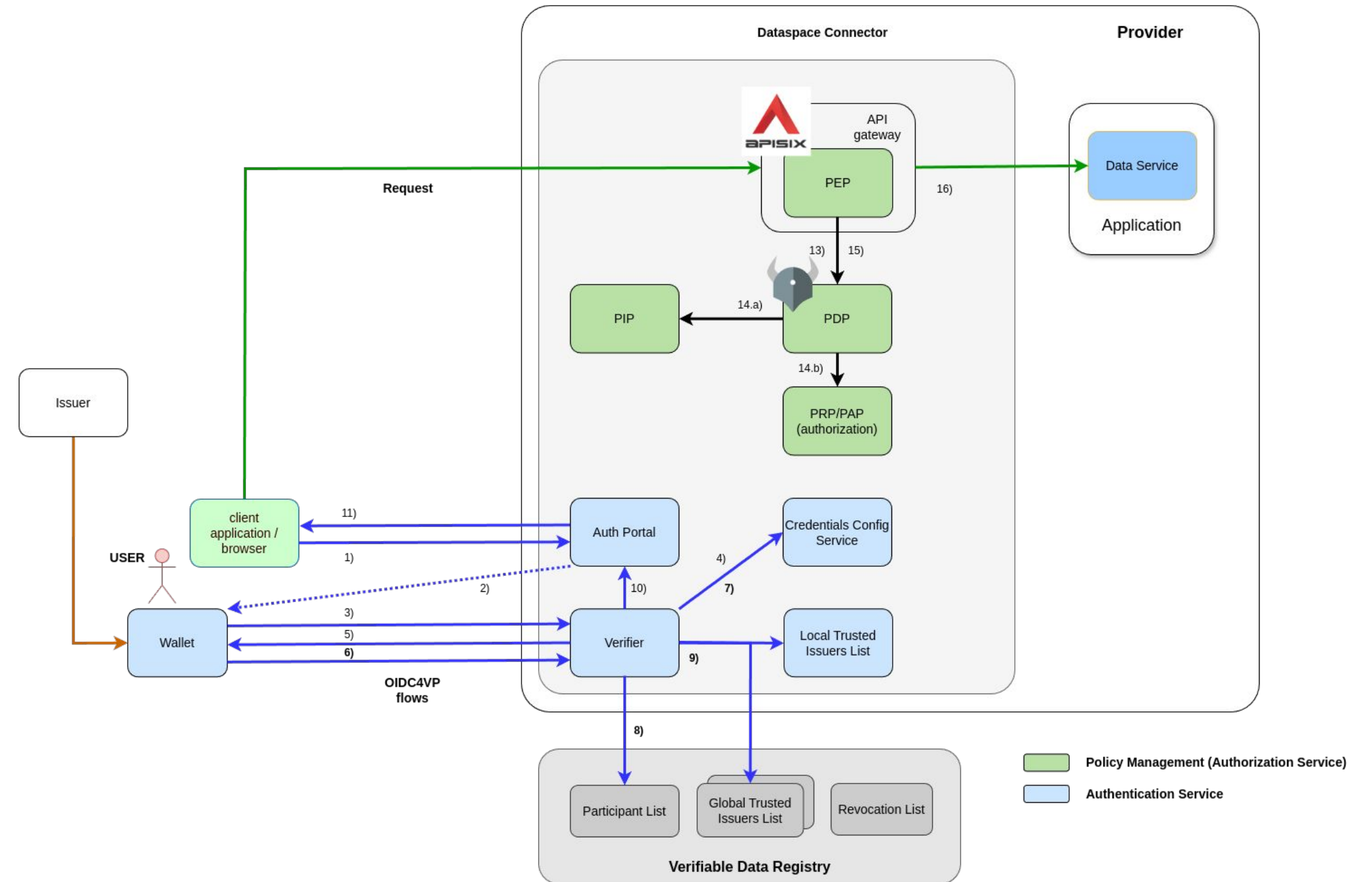
Usage for authentication and authorization

- Trustable source of information
 - Reuse of already validated information
 - Compliance with legal regulations(f.e. eIDAS2.0)
 - GDPR compliance - no information storage required, perseverance of privacy
- Connectability
 - Reuse of common data formats
 - Standardized, secure exchange through open protocols (Open ID for Verifiable Credentials)
 - Freedom of implementation - Open Source Solutions available



Architecture for authentication and authorization

- Based on the FIWARE Data Space Connector
- Authentication
 - VCVerifier to provide OID4VP endpoints
 - Credentials Config Service allowing fine grained configuration
 - Trusted Issuers List to define Trust per Credential-Type
- Authorization
 - Apisix as ApiGateway, enforcing policies
 - OpenPolicyAgent to evaluate policies
 - ODRL-PAP to manage policies in the ODRL format



Useful links

- FIWARE Data Space Connector:
 - <https://github.com/FIWARE/data-space-connector>
- ODRL-PAP:
 - <https://github.com/wistefan/odrl-pap>
- VCVerifier:
 - <https://github.com/FIWARE/VCVerifier>
- Slides:
 - <https://github.com/wistefan/presentations>



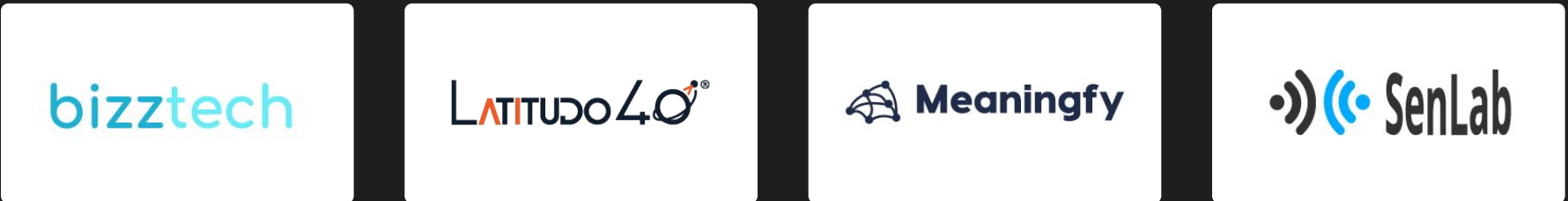
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