



REPUBLIC OF ESTONIA
INFORMATION SYSTEM AUTHORITY



European Union
European Structural
and Investment Funds


















Investing
in your future



The backbone of e-Estonia

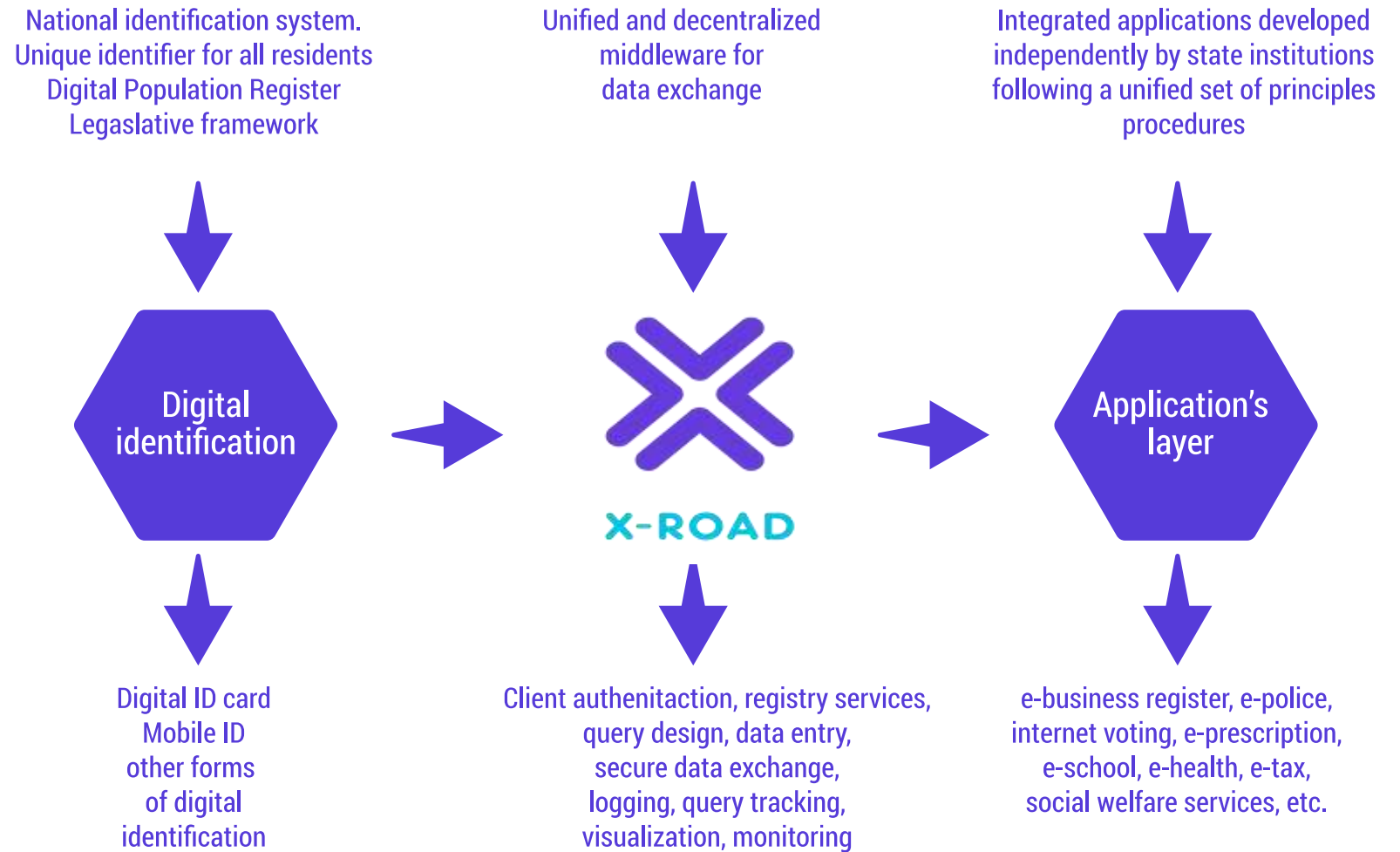
Andrus Kaarelson
Director of Information System

Public e-services

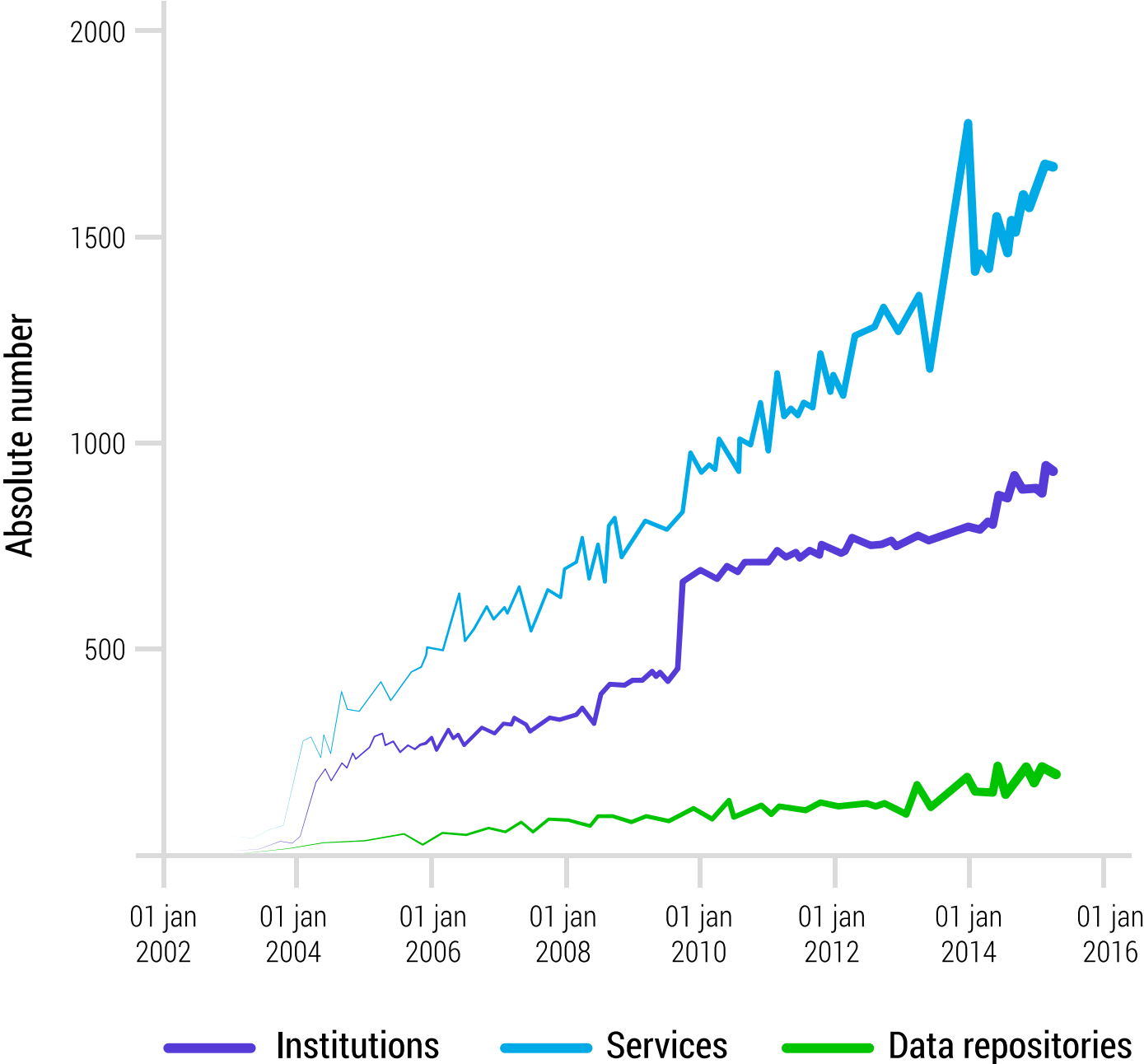
 <p>Digital Signature</p> <p>Digital signature enables secure, legally-binding, electronic document signing</p>	 <p>e-Law</p> <p>Allows public access to every piece of draft law that has been submitted since February 2003</p>	 <p>e-Prescription</p> <p>A centralized, paperless system for issuing and handling medical prescriptions</p>	 <p>e-School</p> <p>Allow students, teachers and parents to collaborate in the learning process</p>	 <p>e-Tax</p> <p>e-Tax has drastically reduced the time spent by individuals and entrepreneurs on filing taxes</p>
 <p>Electronic Health Record</p> <p>Integrates data from healthcare providers into a national record for each patient</p>	 <p>Electronic ID Card</p> <p>e-ID acts as definitive proof of ID in secure electronic environments</p>	 <p>Electronic Land Register</p> <p>A one-of-a-kind information system for storing real estate and land data</p>	 <p>i-Voting</p> <p>i-Voting allows voters to cast their ballots over the internet, from anywhere in the world</p>	 <p>m-Parking</p> <p>Allows drivers to pay for city parking using a mobile phone</p>
 <p>Mobile-ID</p> <p>Allows a client to use a mobile phone as a form of secure electronic ID</p>	 <p>Mobile Payment</p> <p>Enables payment for goods and services using mobile phones</p>	 <p>Population Register</p> <p>The state database for basic information about each person living in Estonia</p>	 <p>Social Welfare e-Services</p> <p>The social welfare benefit system is accessible by a convenient, online environment</p>	 <p>State e-Services Portal</p> <p>A one-stop-shop for the hundreds of e-services offered by government institutions</p>

Components of Estonia's e-governance ecosystem

The cornerstones of the ecosystem



Growth of X-Road ecosystem

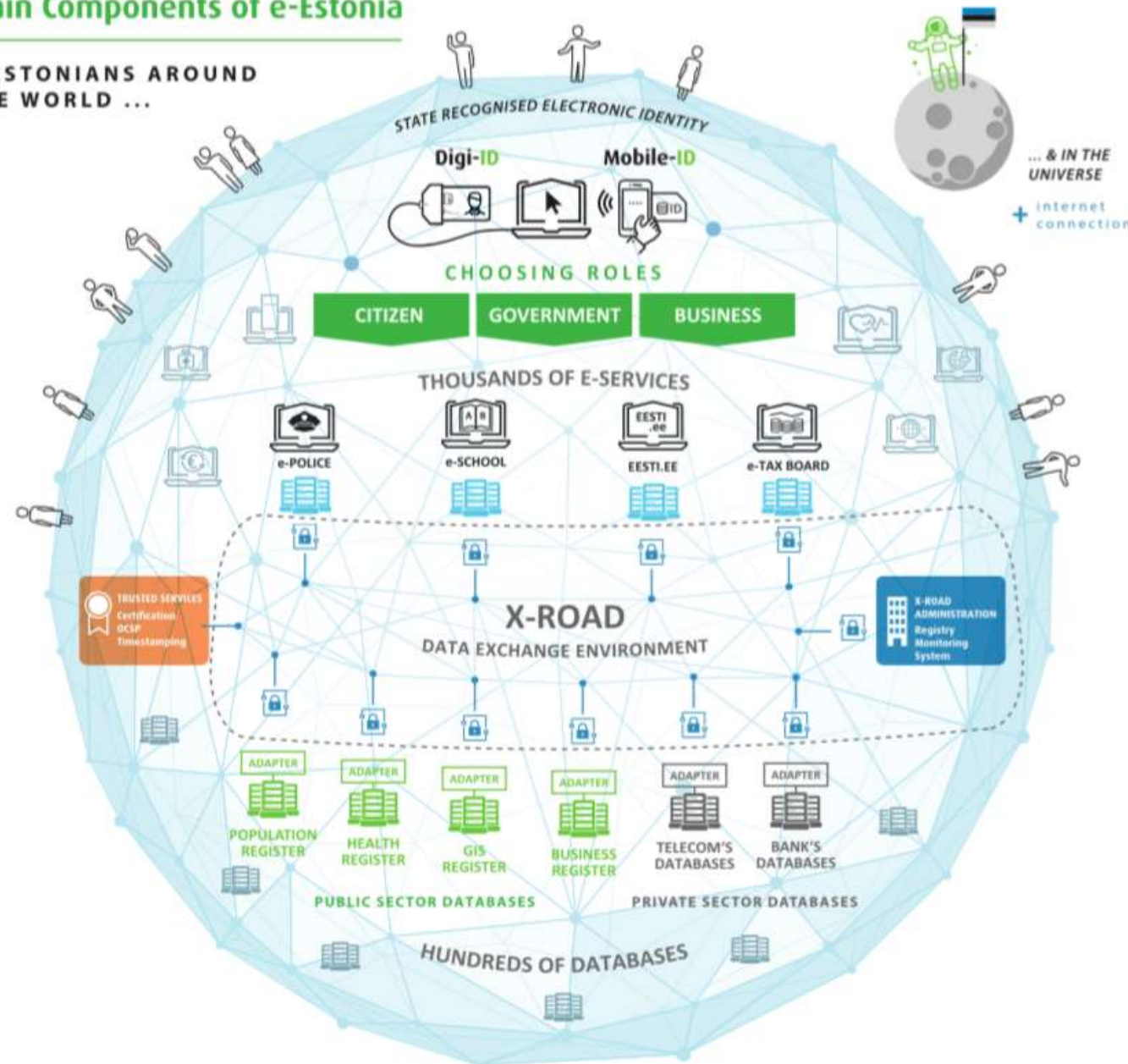


X-Road – what is it?

- Organisational and technical solution that enables secure data exchange for members
- Members own and exchange data, not anyone else.
- Rules for data exchange are also needed.
- Uses the internet
- Maintains freedom for its members
- Ensures the authenticity of members
- Provides means for secure information exchange

Main Components of e-Estonia

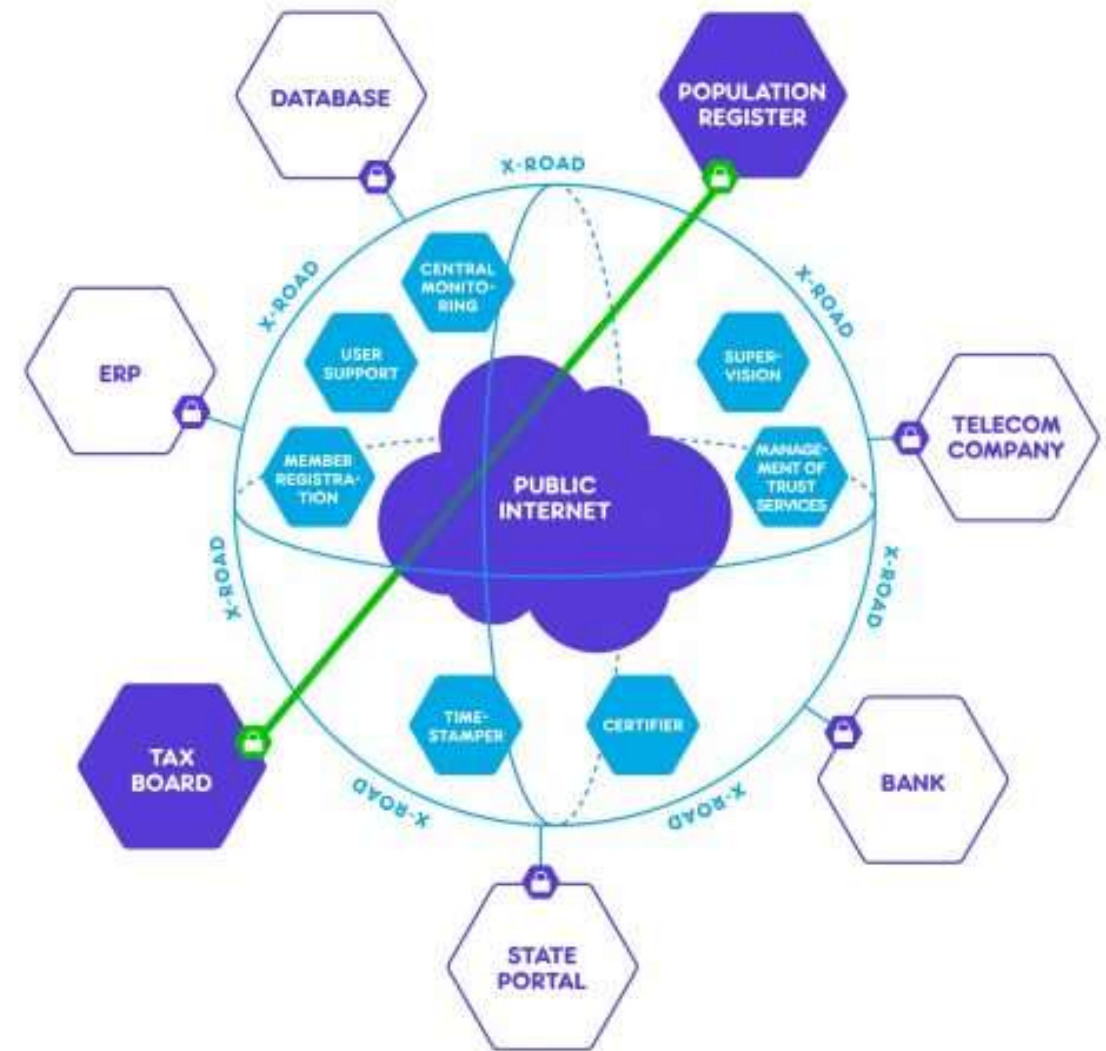
e-ESTONIANS AROUND THE WORLD ...



X-road video introduction

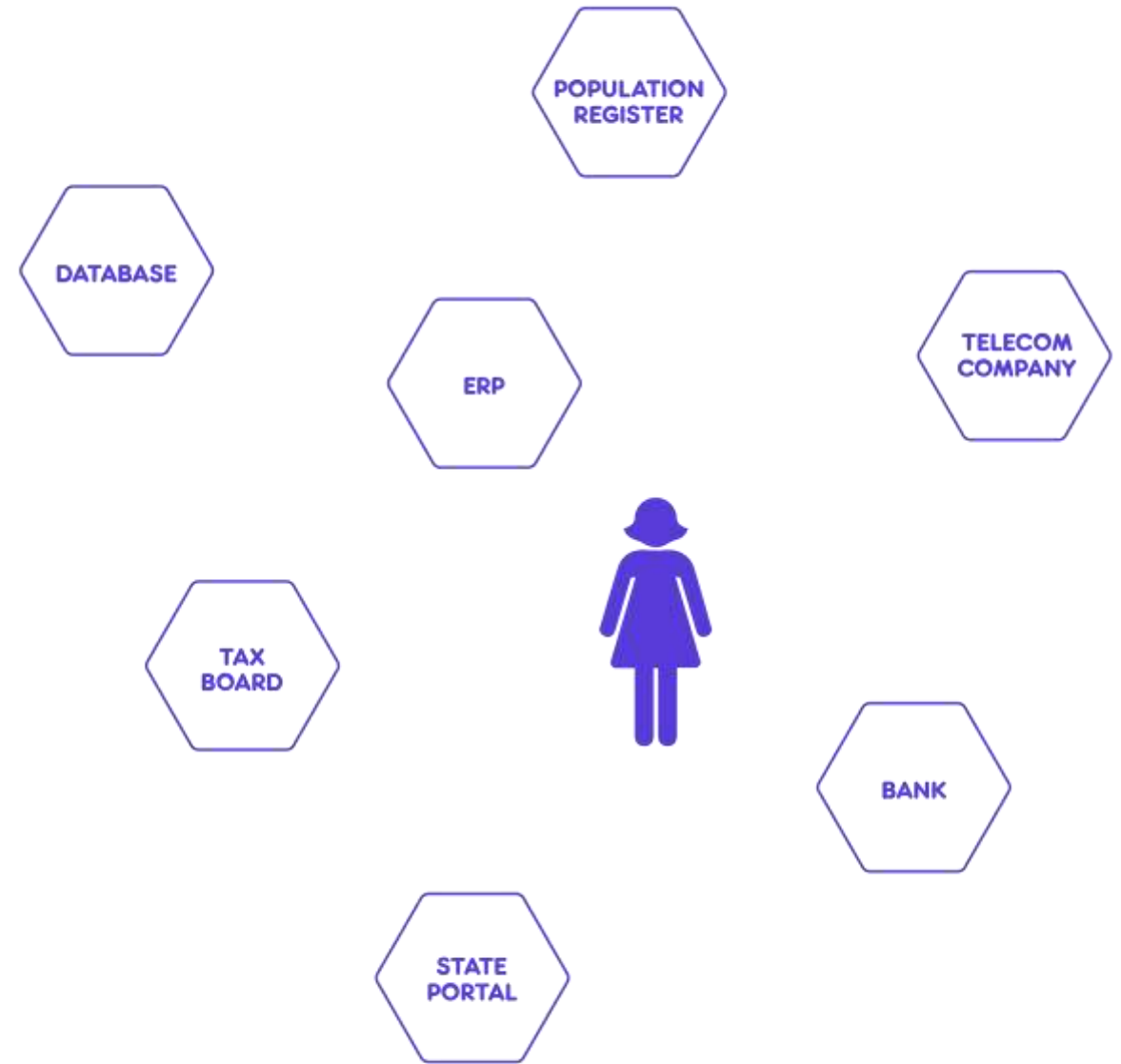
- Official video by RIA:

https://www.youtube.com/results?search_query=x-road



Necessity to provide services

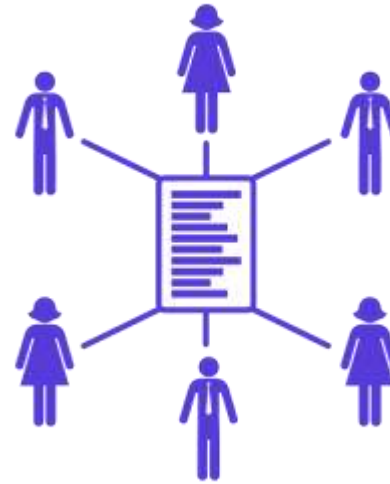
- Different parties
- Data exchange
- Interoperability and information security



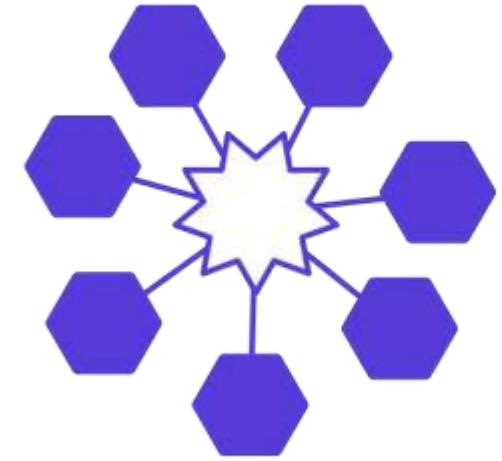
Various opportunities

The following should be taken into account when selecting a suitable solution:

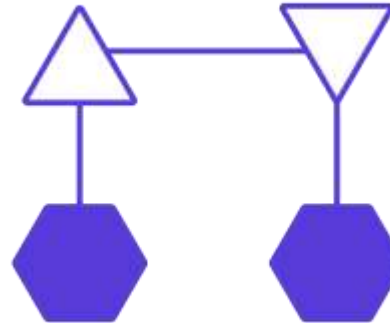
- Operating costs
- Administrative complexity
- Information security
- Flexibility
- Scalability



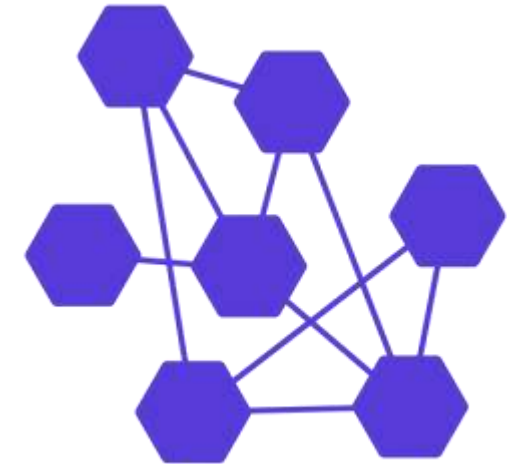
1. Centralized database



2. Central enterprise service bus (ESB)



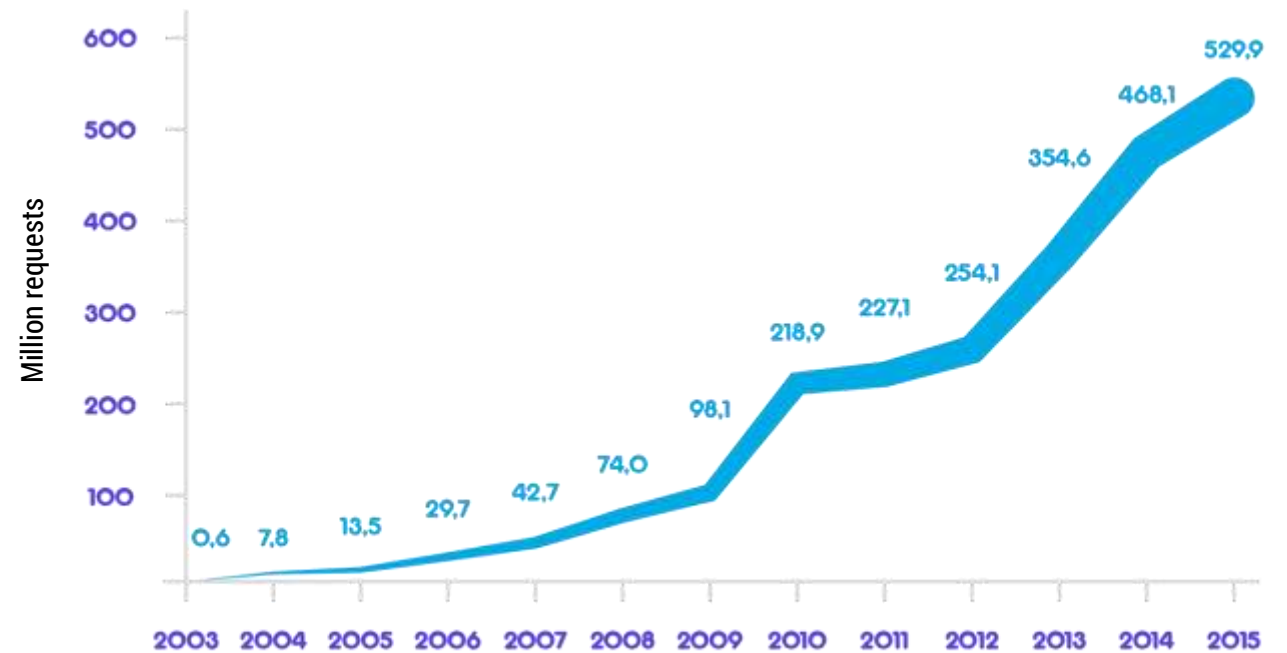
3. Four-Corner-Model



4. Distributed architecture

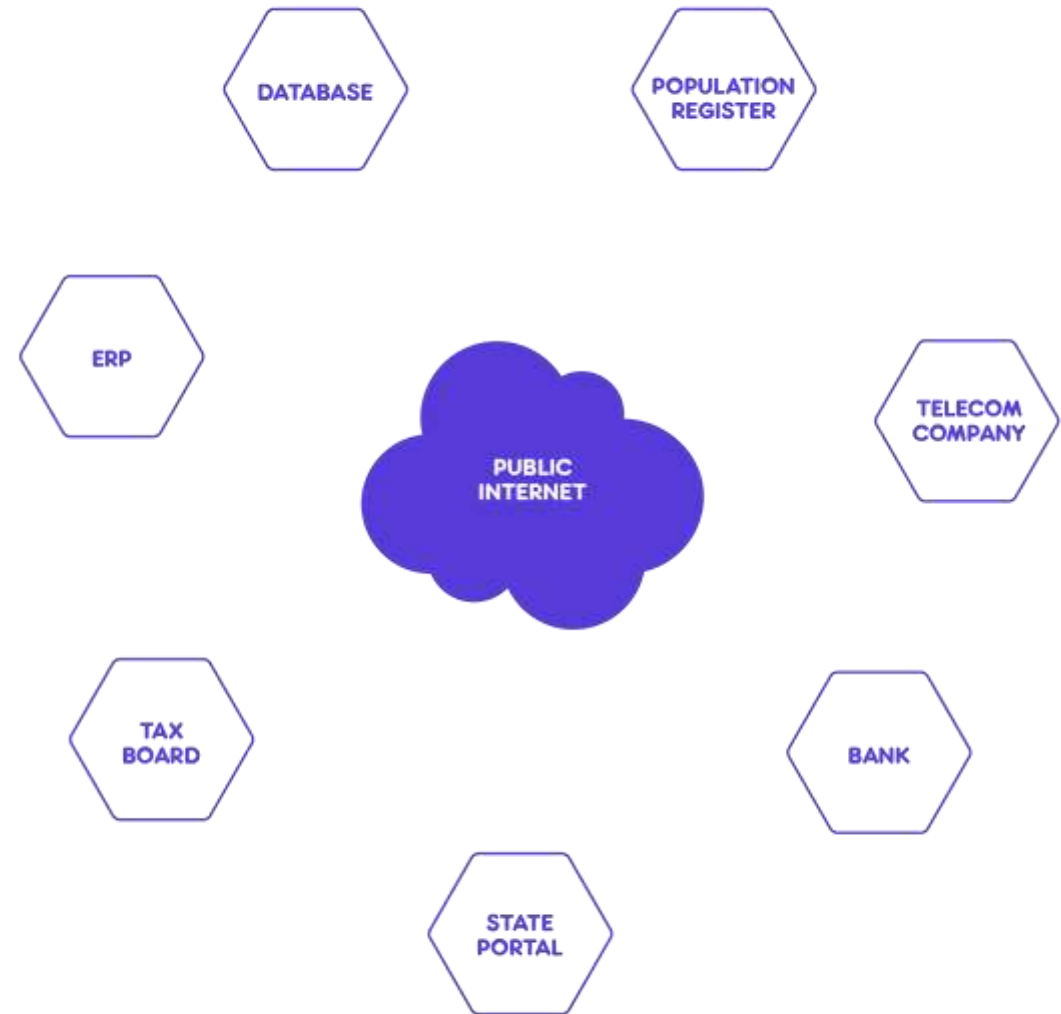
Robust and high-quality

- 15 years of continuous operations
- Stability
- There are no back doors
- The European Framework of Interoperability
- eIDAS requirements for trust services
- Quality of technical product by Estonia and Finland



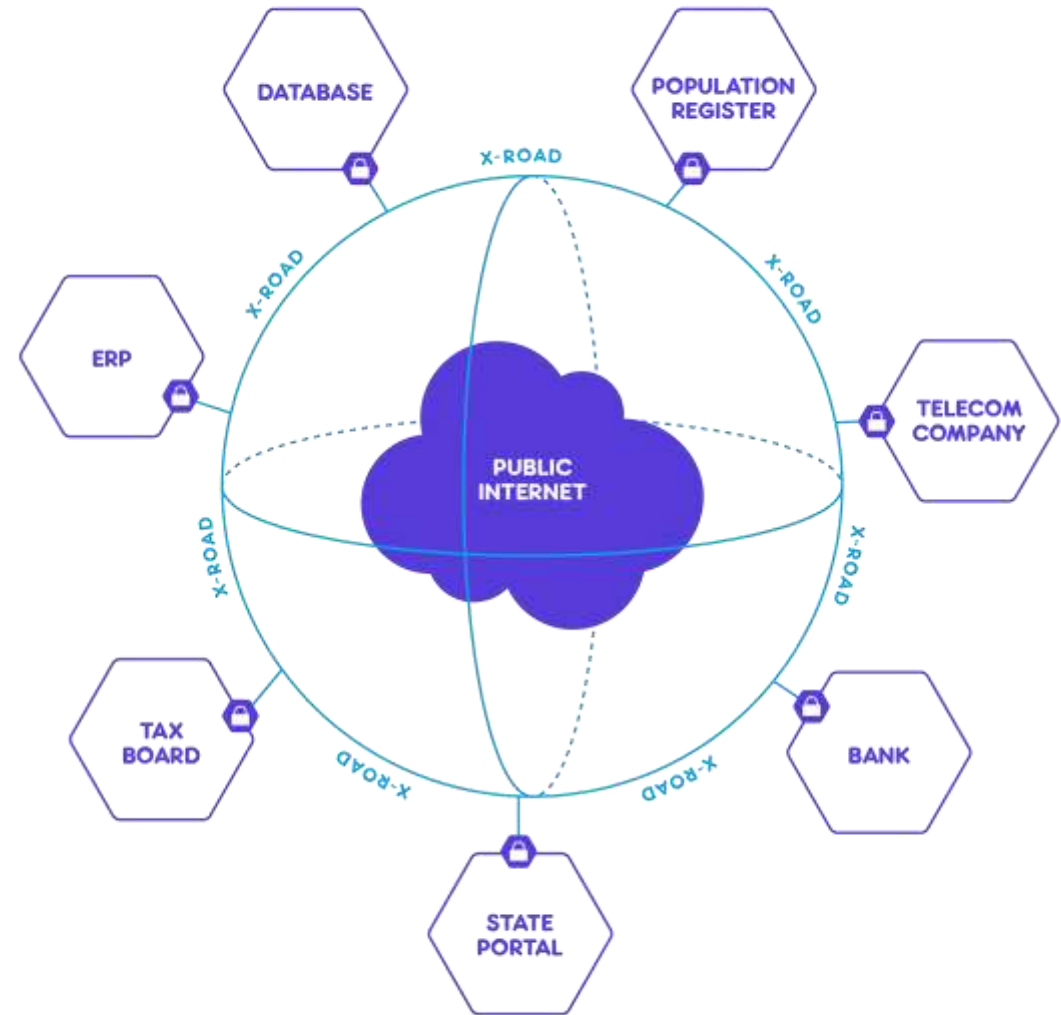
Starting points

- Everyone is aware of their internal processes
- Everyone is in the network
- Security of data exchange



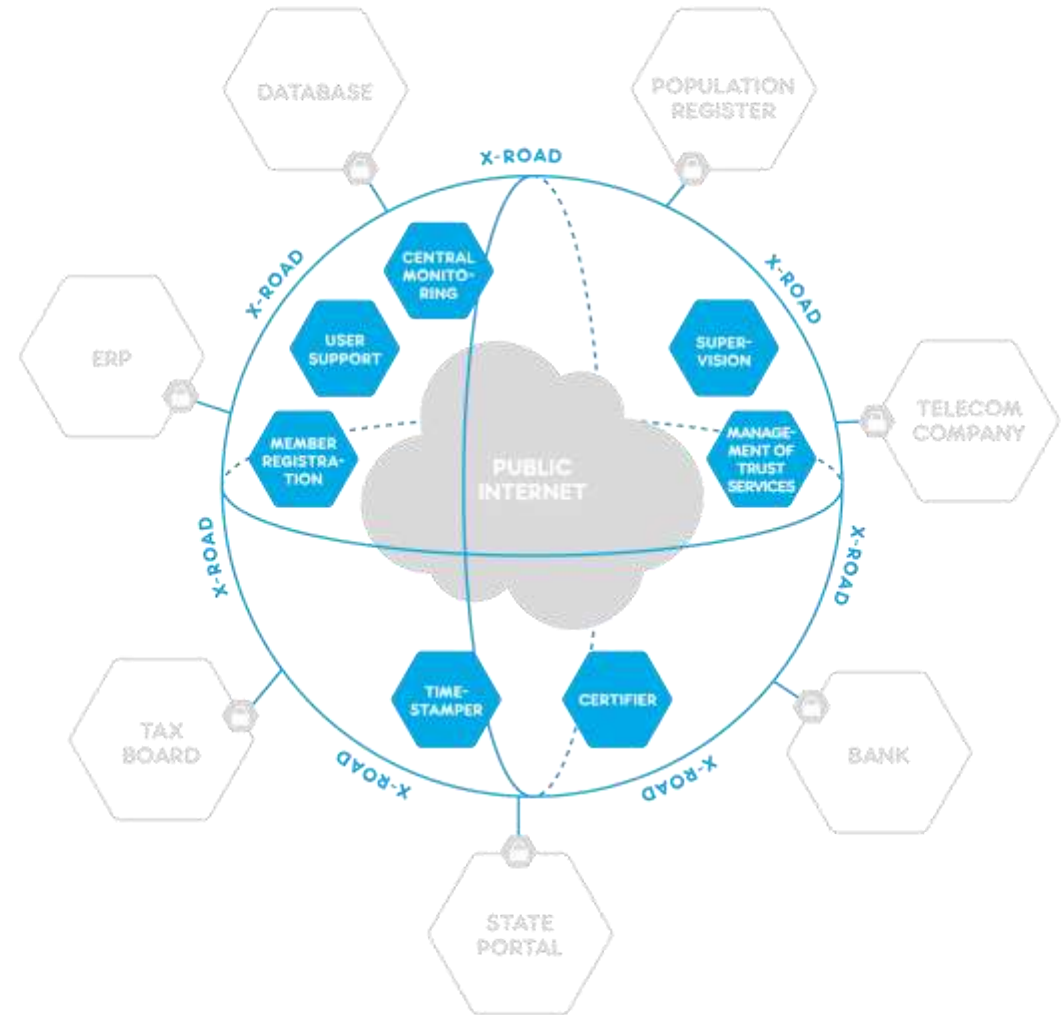
X-Road: organisation method of a distributed state information system

- Uses the internet
- Maintains freedom for its members
- Ensures the authenticity of members
- Provides means for secure information exchange



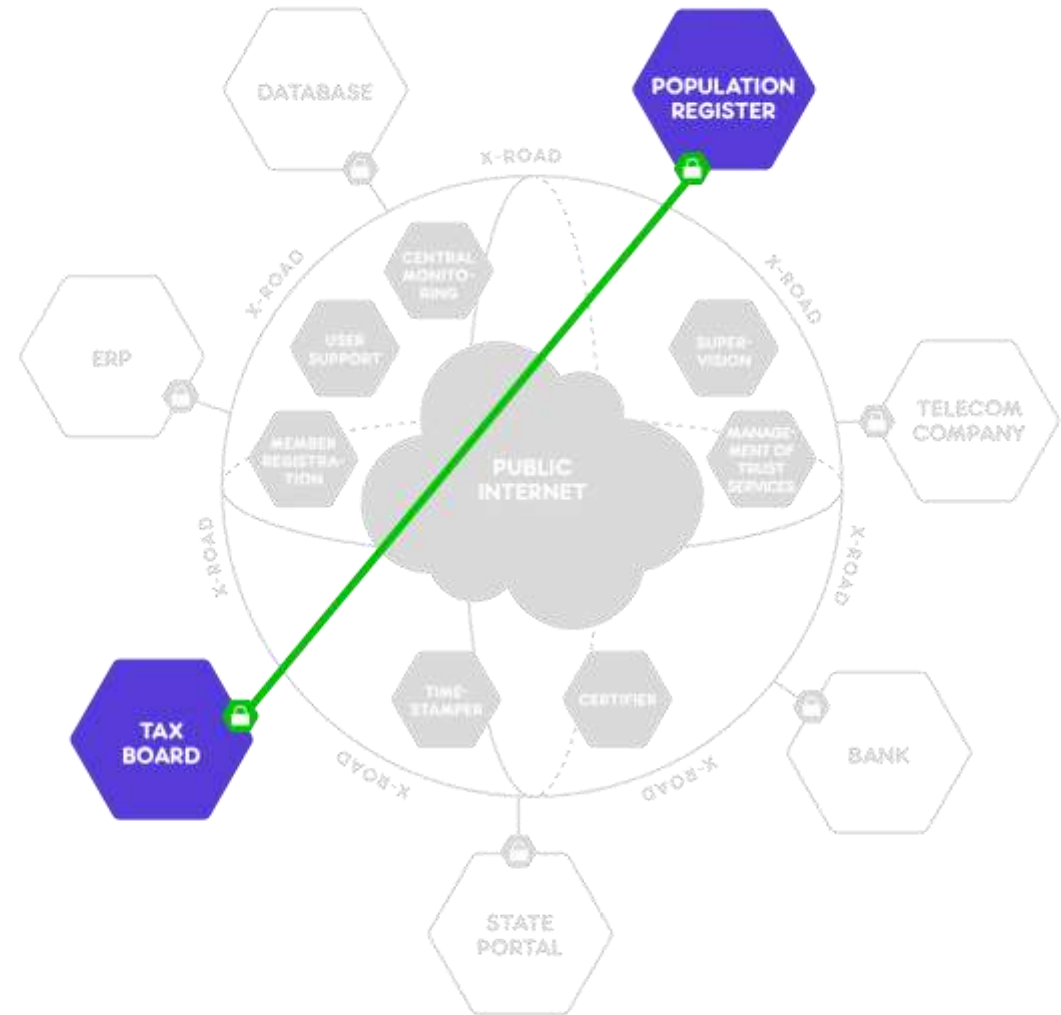
Role of the X-Road Centre

- Registration of members
- User support
- Central monitoring
- Supervision
- Management of trust services
- Timestamp and certification service



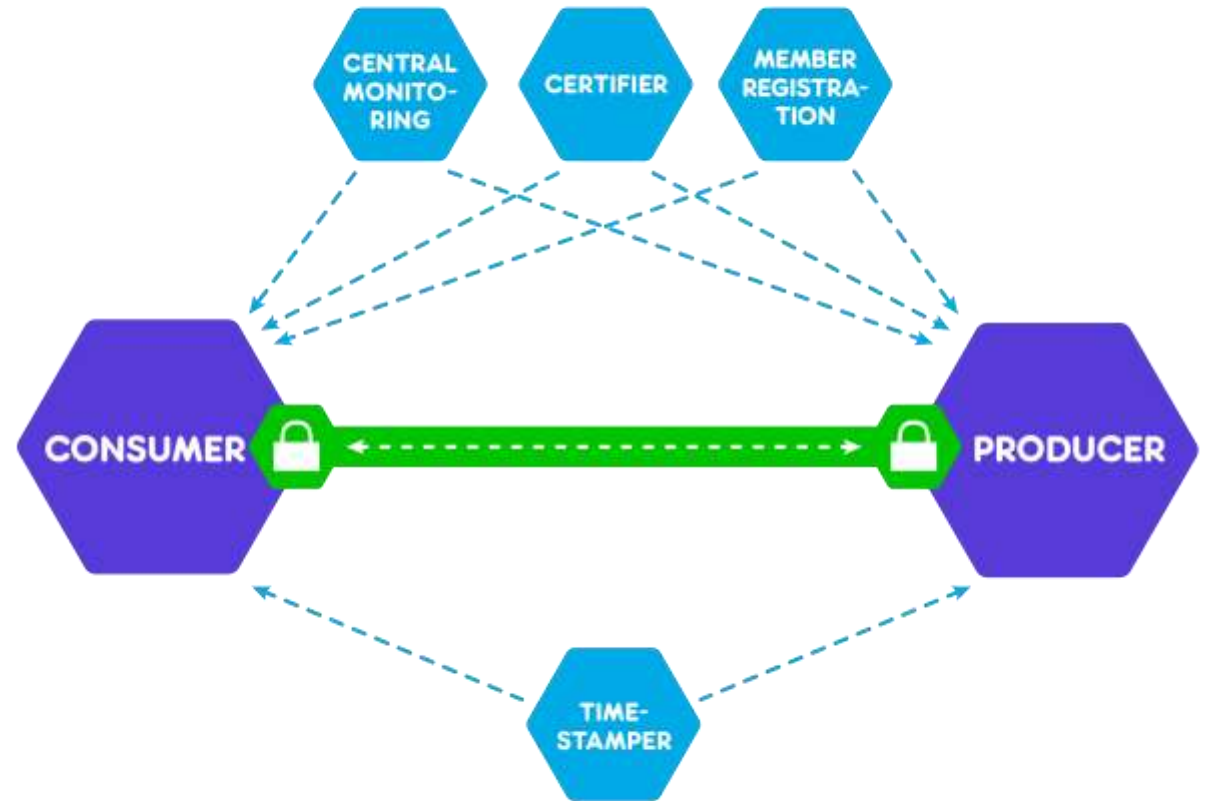
The X-Road Centre is not involved in data exchange

- Universal membership
- Freedom of choice
- Direct communication



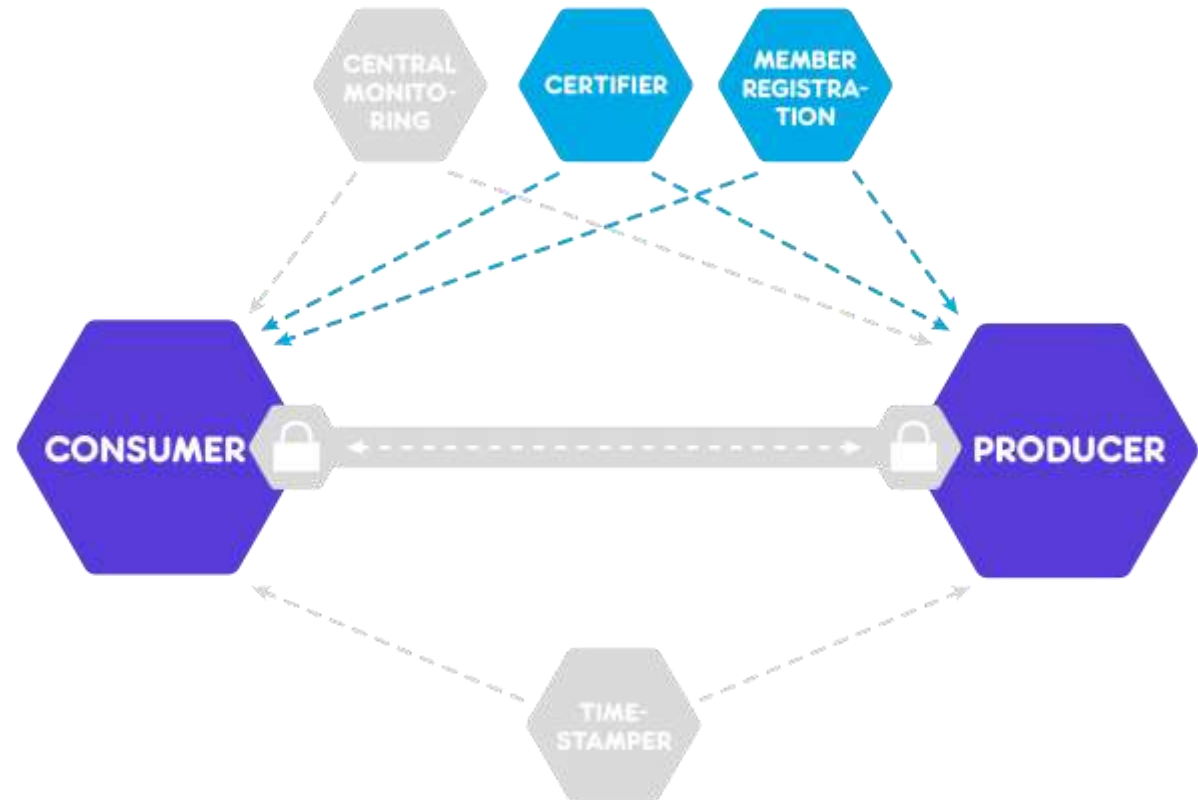
Overview of communication/ data exchange

- Availability
- Integrity
- Confidentiality



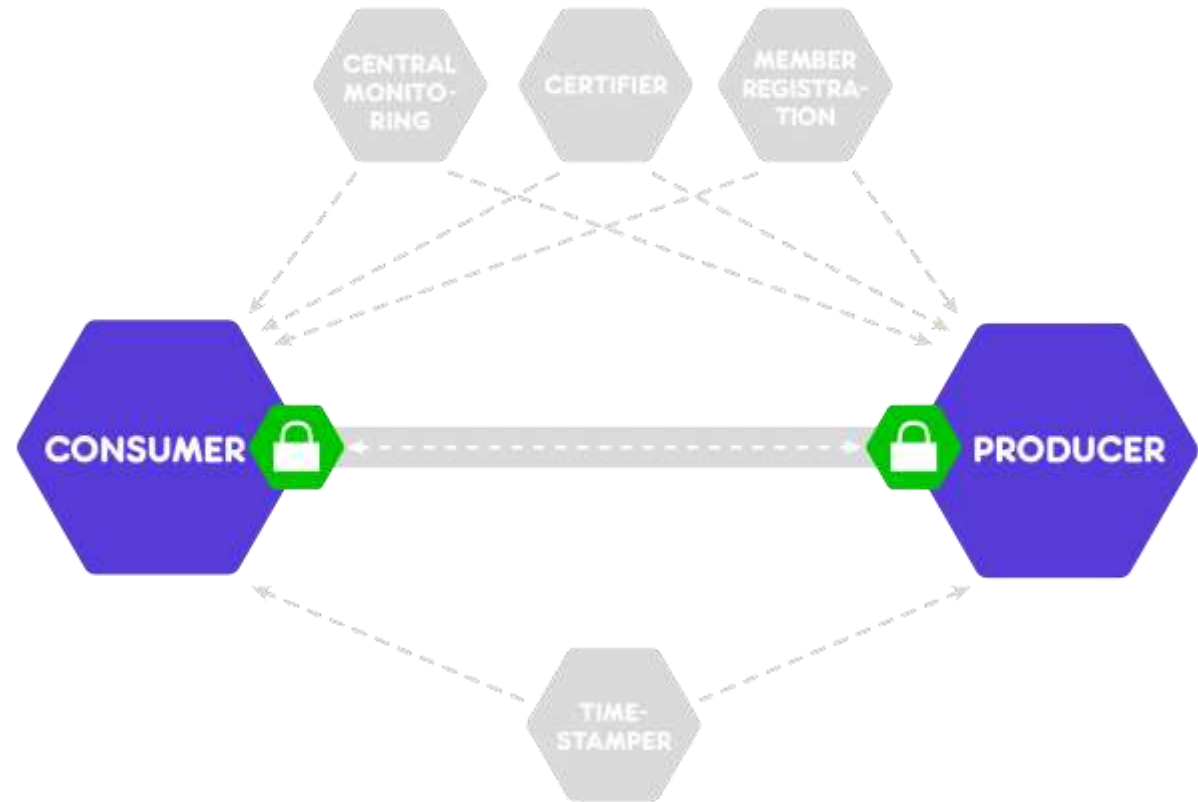
Joining

- Procurement of certificate and OCSP service
- Joining the X-Road
- Procurement of the timestamp service



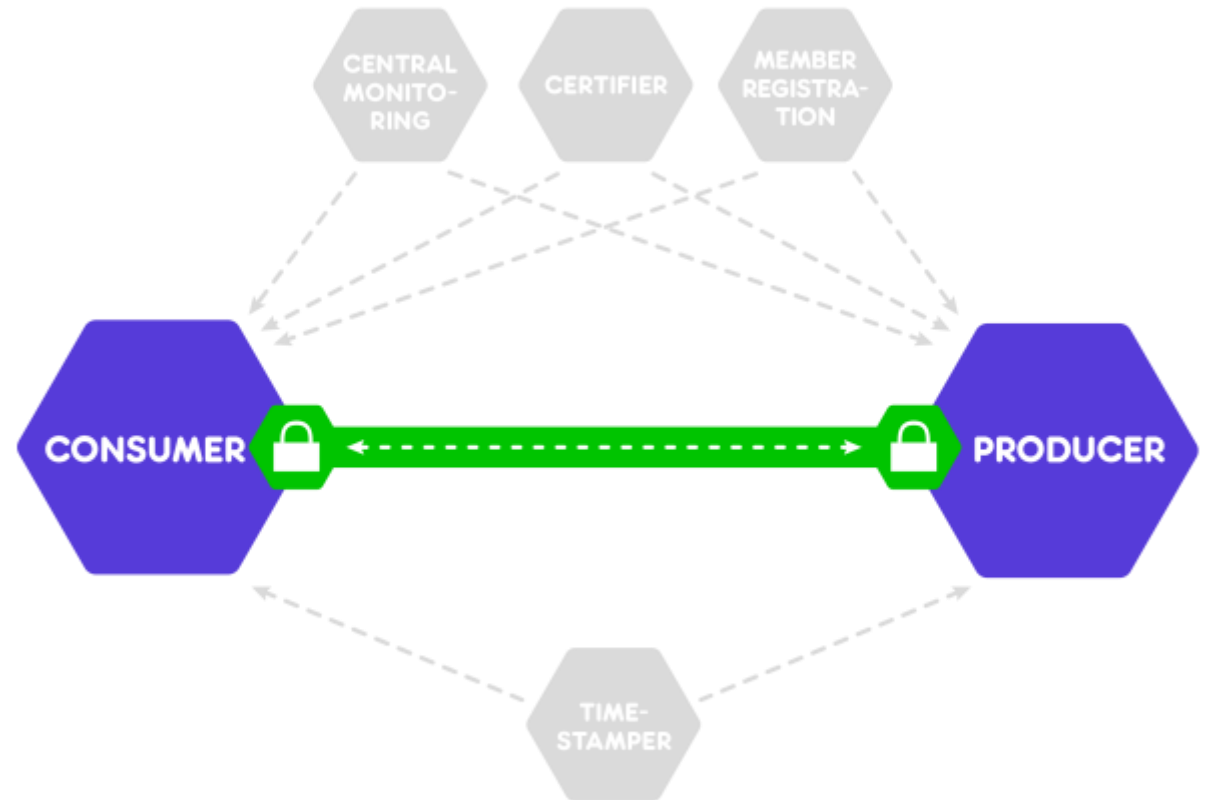
Services and access rights

- Describing the service
- Providing access rights



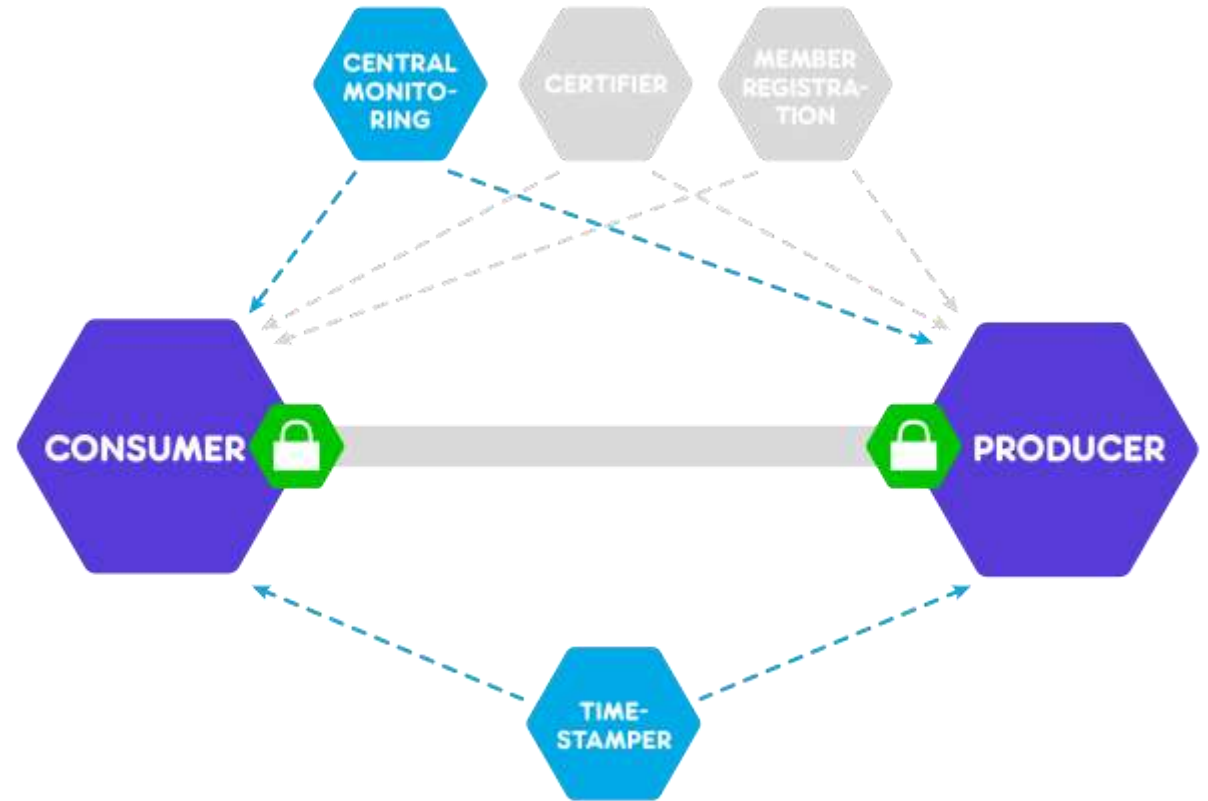
During a transaction

- Signing/stamping a request
- Creating an encrypted channel
- Verifying a signature/stamp
- Signing/stamping a response
- Sending a response
- Verifying a response signature



Long-term confirmation of transaction

- Timestamping messages
- Central monitoring input

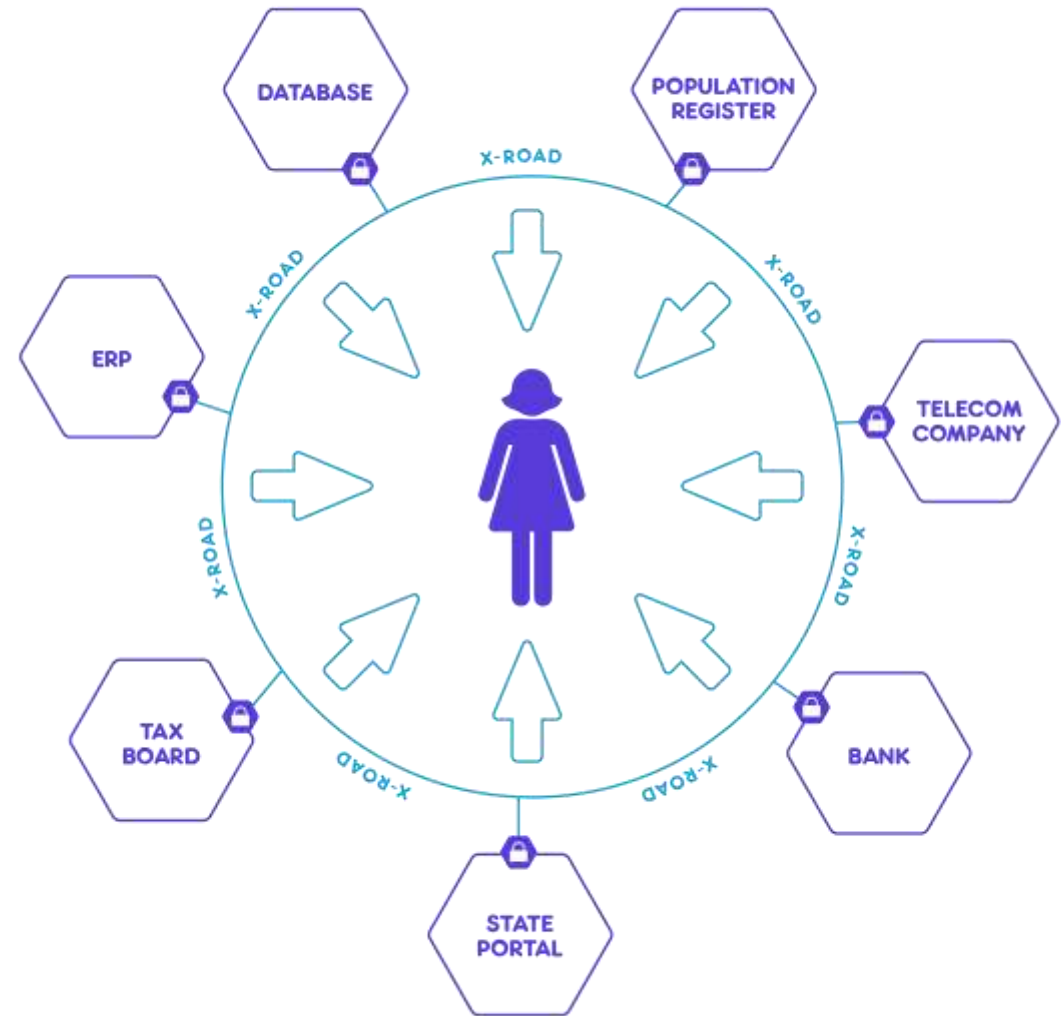


„Once-only“

Citizen must enter information only once

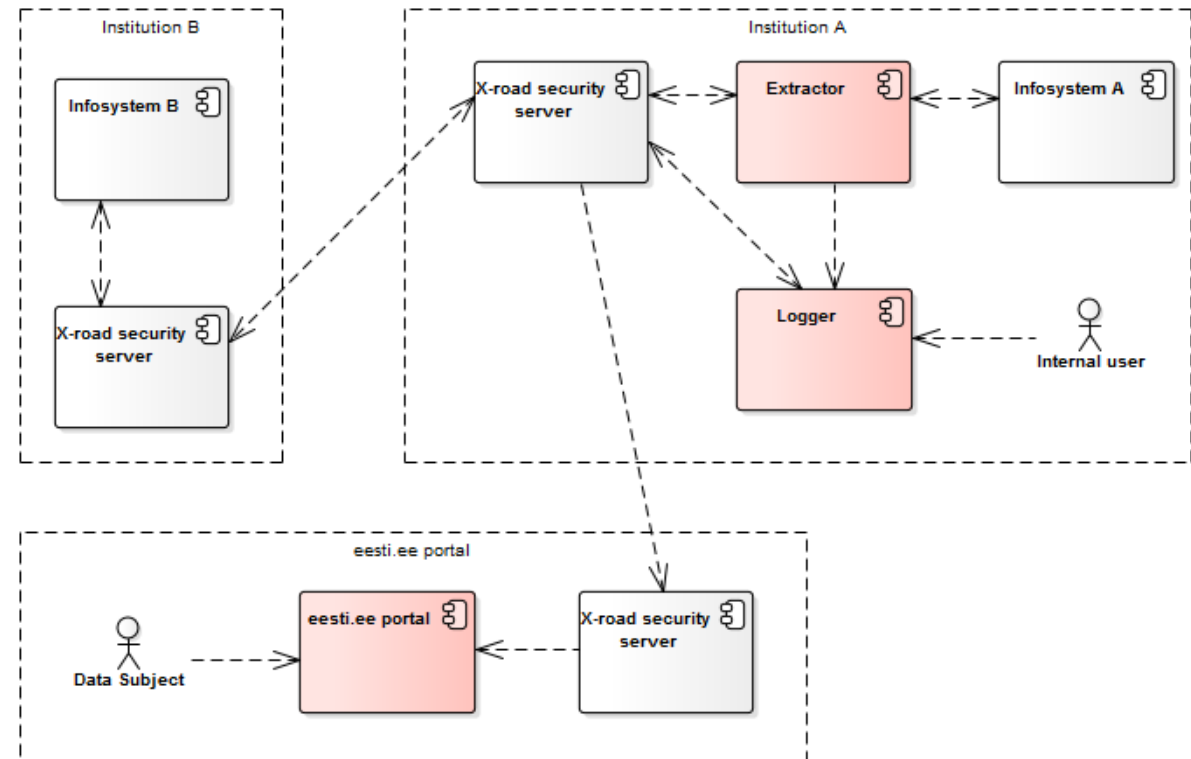
„Twice at least“

Make collected data reusable



Personal Data Usage Monitor

- Data subjects can use www.eesti.ee portal in order to get information, when and to what third party their personal data was transferred.
- Currently there are agreed to present information from:
 - Population Register
 - Health Insurance Register
 - Social Services Register
 - Unemployment Insurance Registry
- Demo: <https://www.eesti.ee/en/>



Cross-border data exchange is about to start

Why Estonia and Finland?

Business case – real need for data exchange

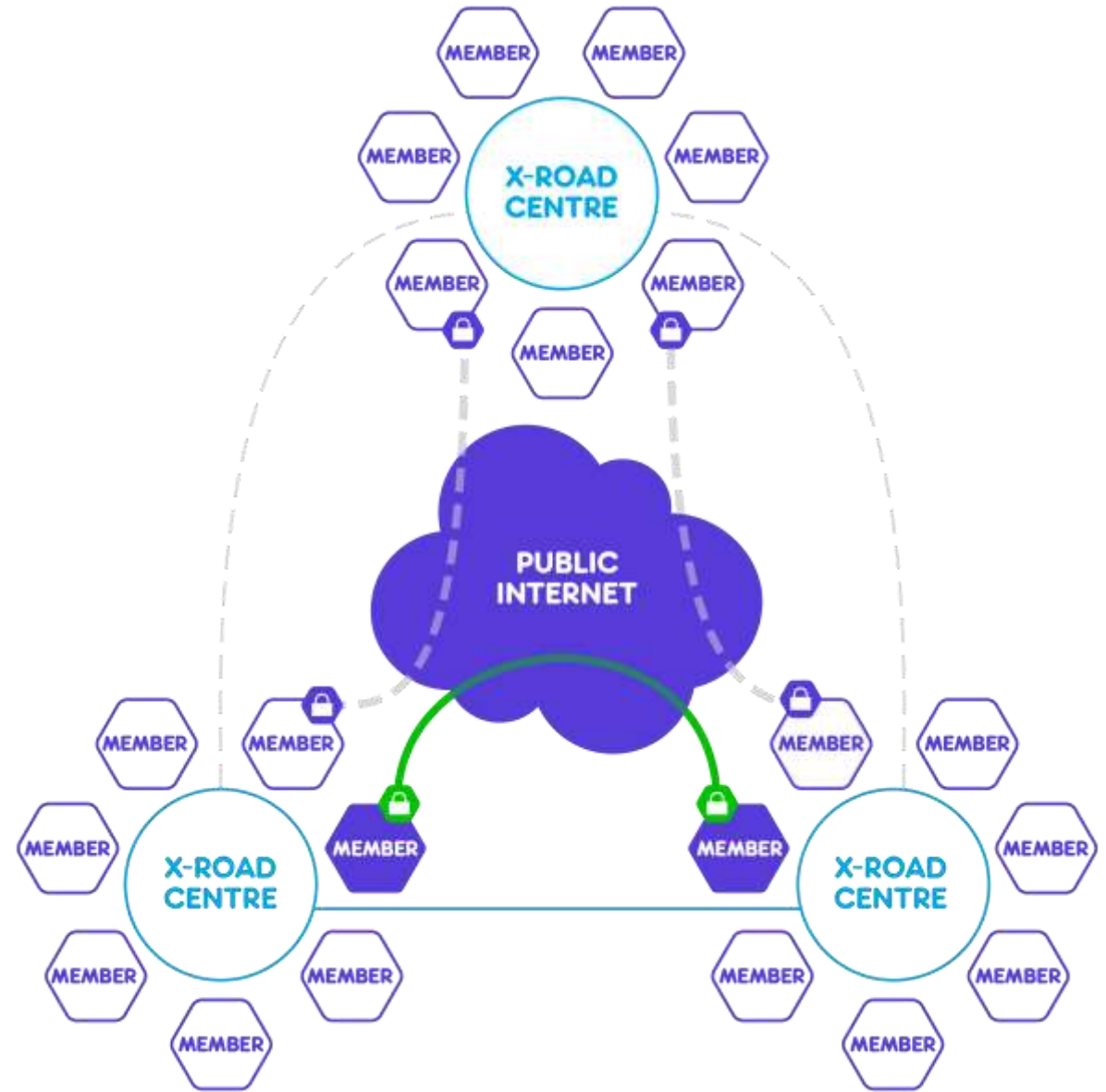
- Taxes
- Population

X-Road and IT – a supporting activity not activity in itself



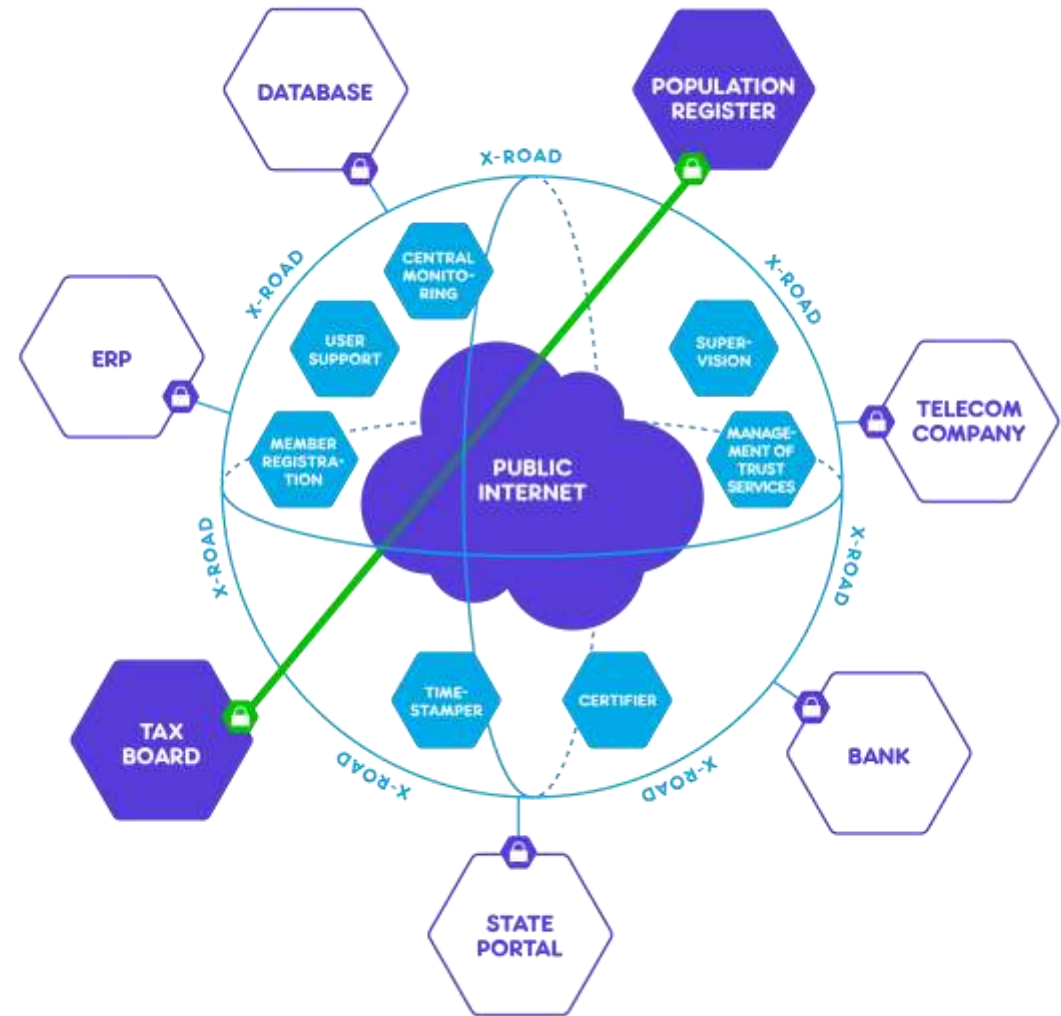
Trust Federation

- Can be expanded everywhere
- Centres communicate with centres, members with other members
- Creation of cross-border services



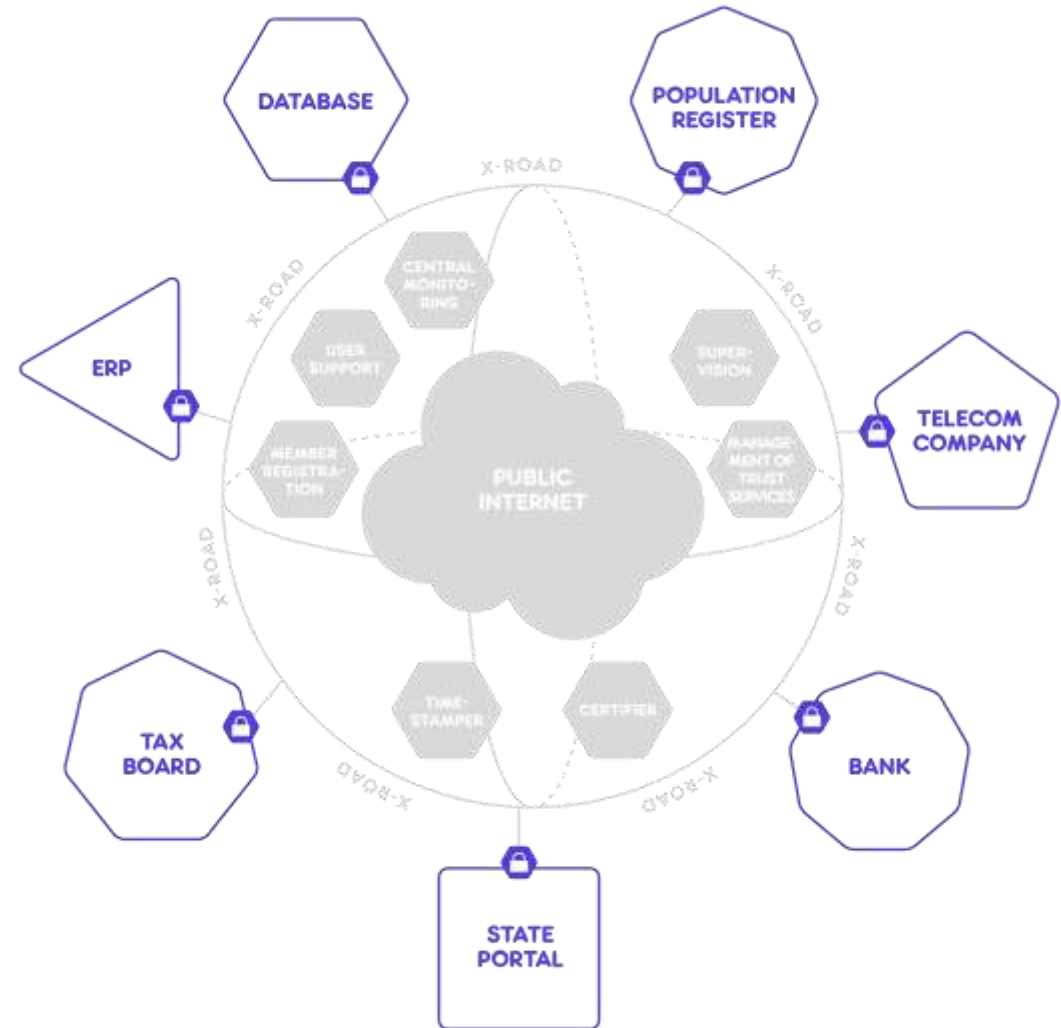
Benefits of the X-Road for the state

- Overview of the entire ecosystem
- Overview of the activity between parties
- Interoperable
- Improving the ecosystem
- Resource efficient



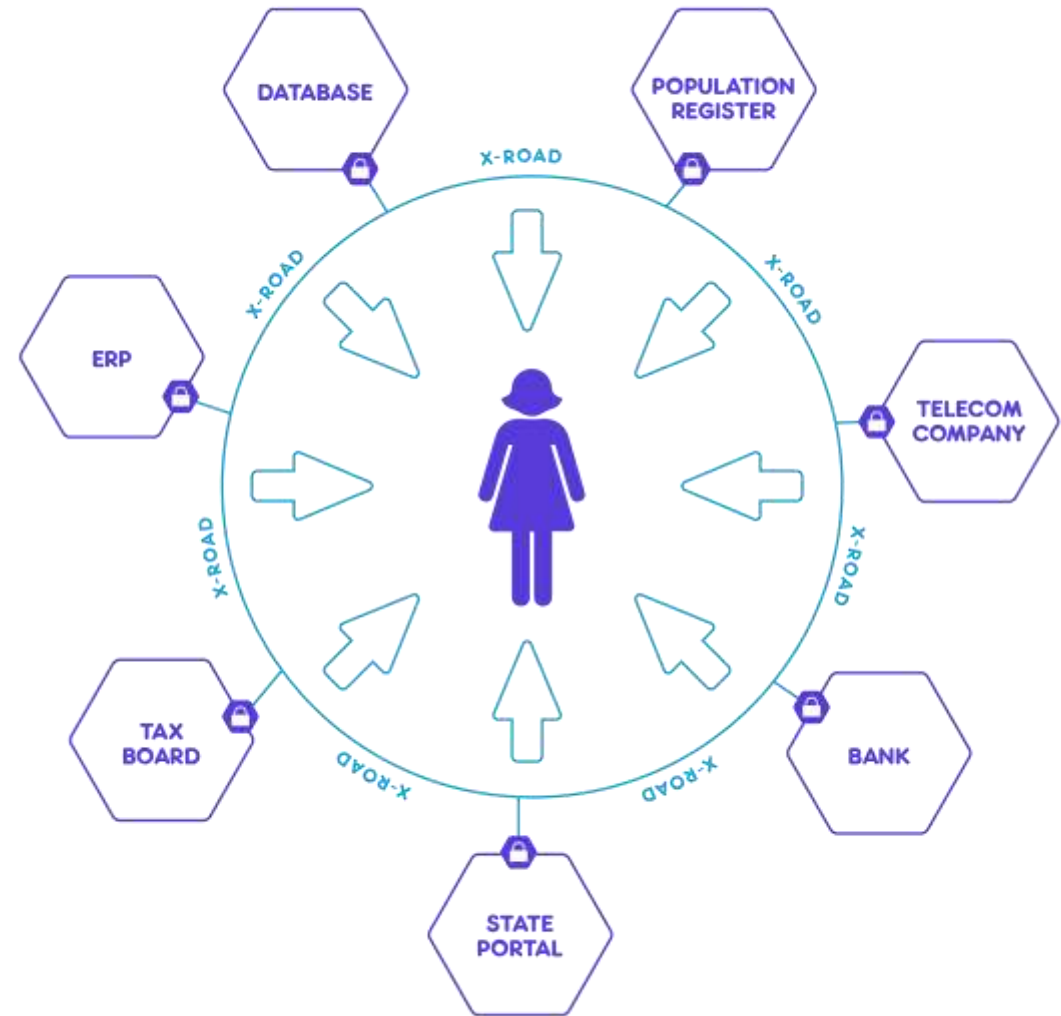
Benefits of the X-Road for a member

- Flexibility
- Interoperability
- Resource efficiency
- Convenience
- Ease of creating new services



Benefits of the X-Road for a citizen

- Ease of using services
- Timesaving
- Financial savings
- New convenient services
- Trust



Prerequisites for using the X-ROAD



Existing information systems



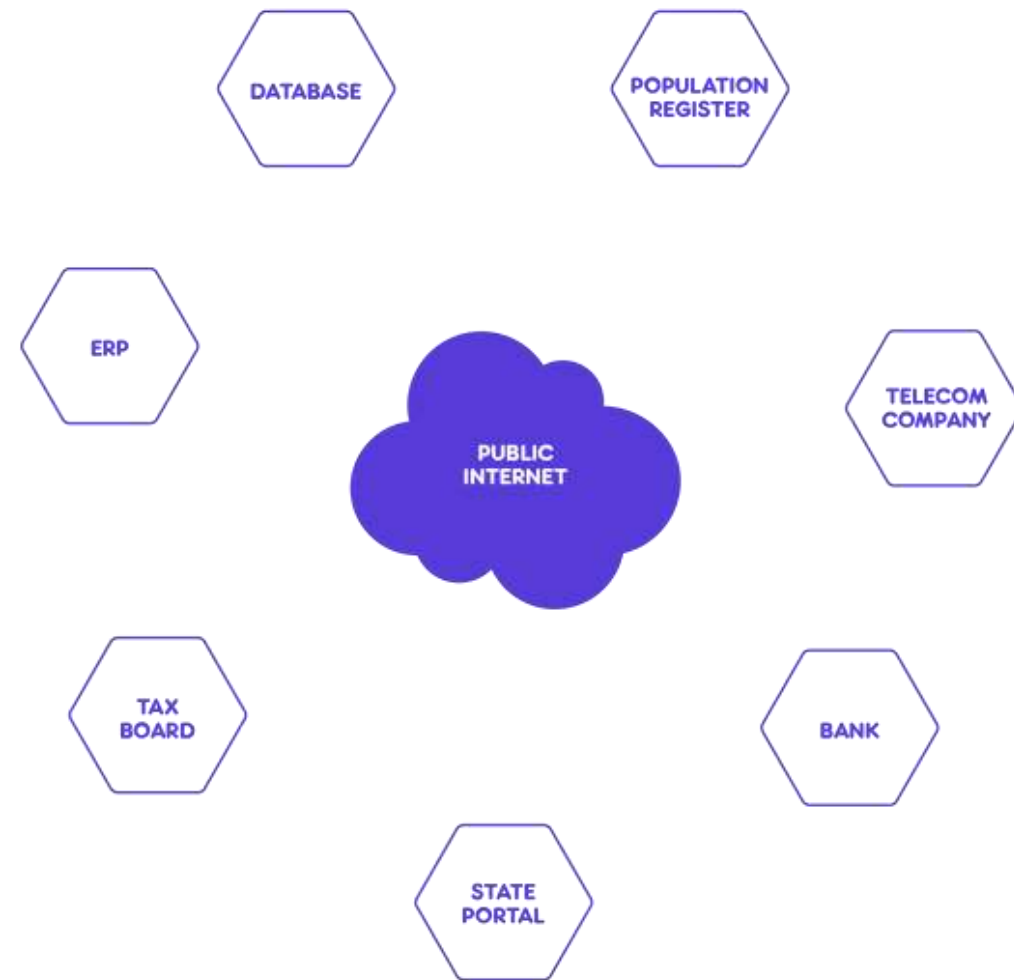
Legalised digital signature



Agreed owners and rights of data



Principles for identifying objects and subjects





Thank You!

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The introductory materials of the X-Road have been compiled with funding from the structural funds support scheme "Raising Public Awareness about the Information Society" of the European Regional Development Fund.

Recapping the benefits:

For the state

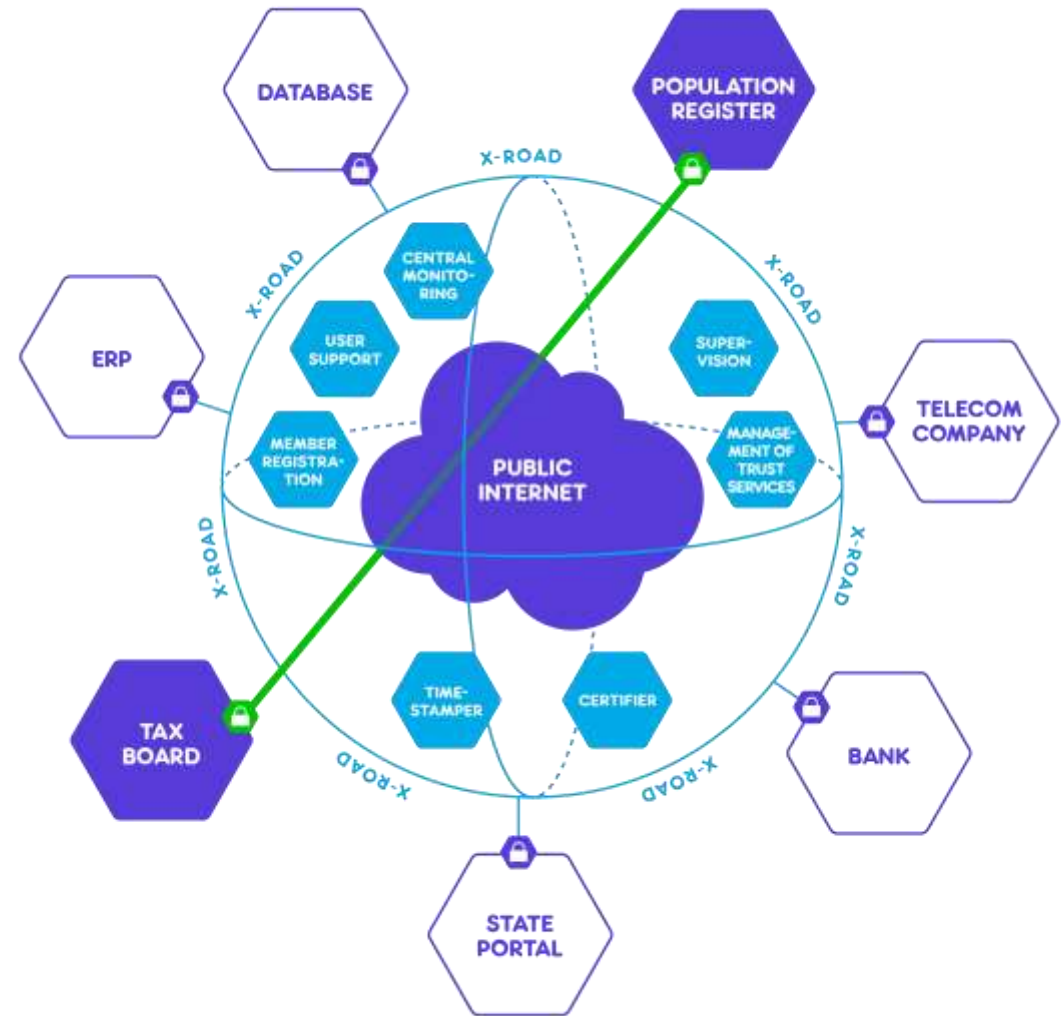
- Overview of the entire ecosystem
- Governance of government information system
- Resource efficient

For a member

- Responsibilities are preserved
- Flexibility & Interoperability
- Ease of creating new services

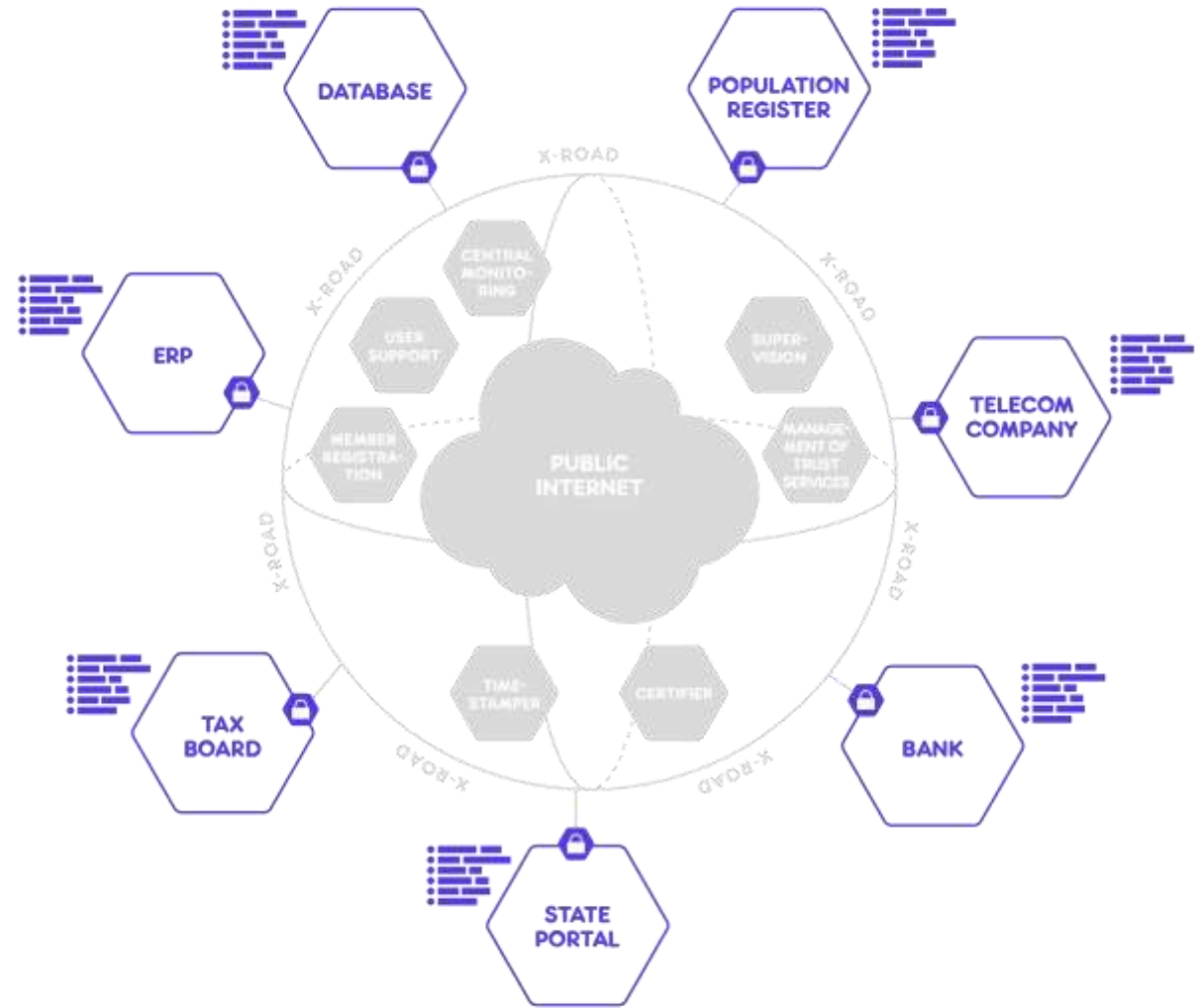
For a citizen

- Ease of using convenient services
- Time and Financial savings
- Trust



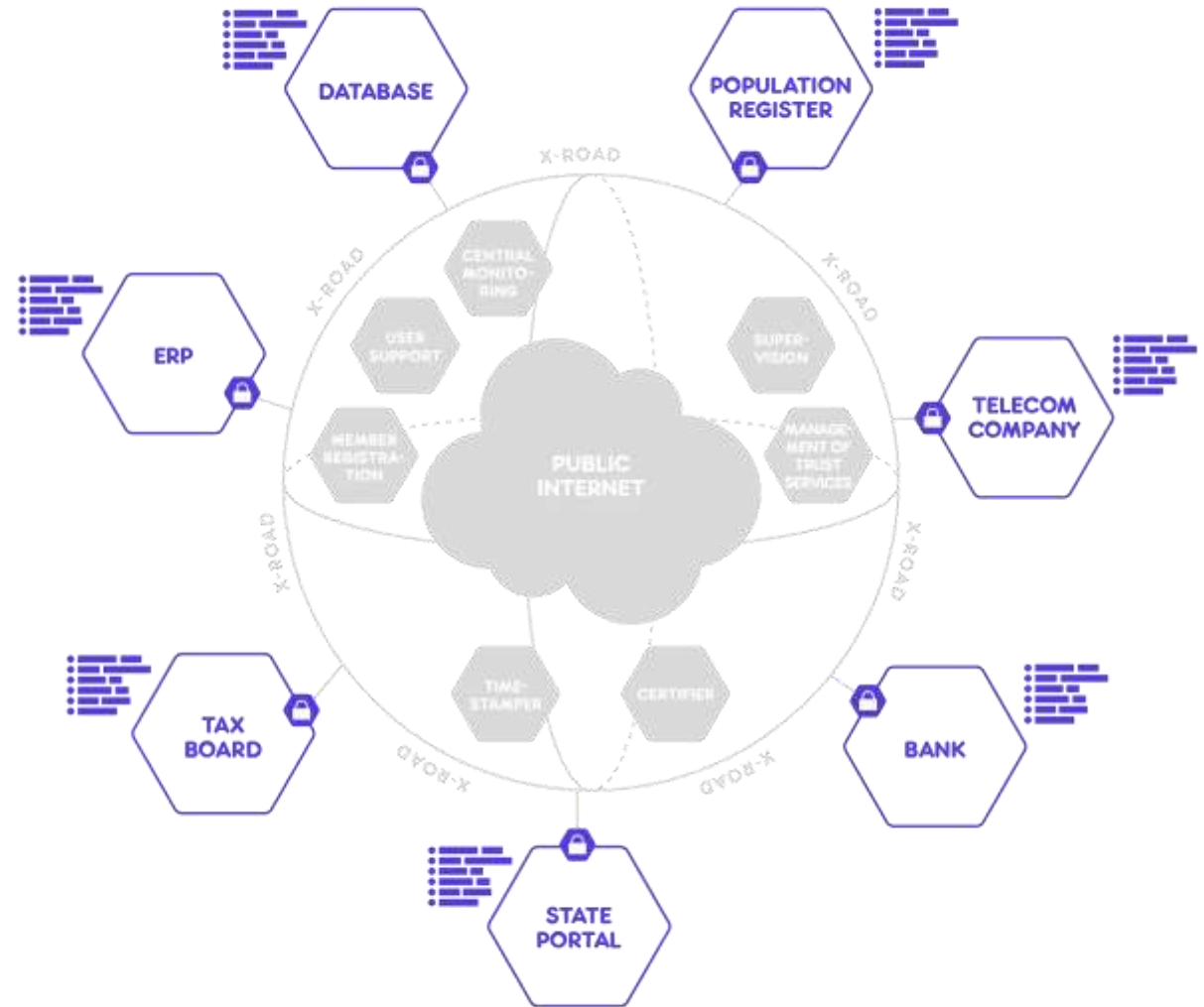
Authenticity and autonomy

- Responsibility is preserved
- Information is reliable
- Autonomy is maintained



Administration system for the state information system

- Complete picture of members and services
- Avoids double solutions and data collection
- Control over compliance with the law



X-ROAD CAPABILITIES

- Once-only
- Administration system for the state information system
- Federated trust

X-ROAD VALUES

- Governability
- Authenticity and autonomy of members
- Security
- Flexibility
- Savings
- Robustness and quality

NIIS was established by Estonian & Finnish governments in June 2017

Nordic Institute for Interoperability Solutions (NIIS) ensures:

- cross-border capability of core e-Government infrastructure components
- the quality
- sustainability
- development

The highest
decision-making
body



General
meeting

Executive level

Management
board

Client and
supervisor



Steering
committee
(X-Road)

Steering
committee
(...)

