Current challenges and actual design patterns for achieving interoperability

Olaf-Gerd Gemein

Where we are today - frankly

1% of data is used – most opportunities wasted
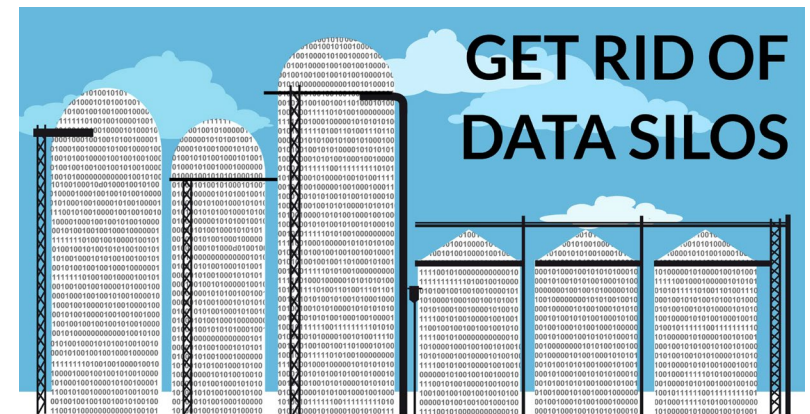
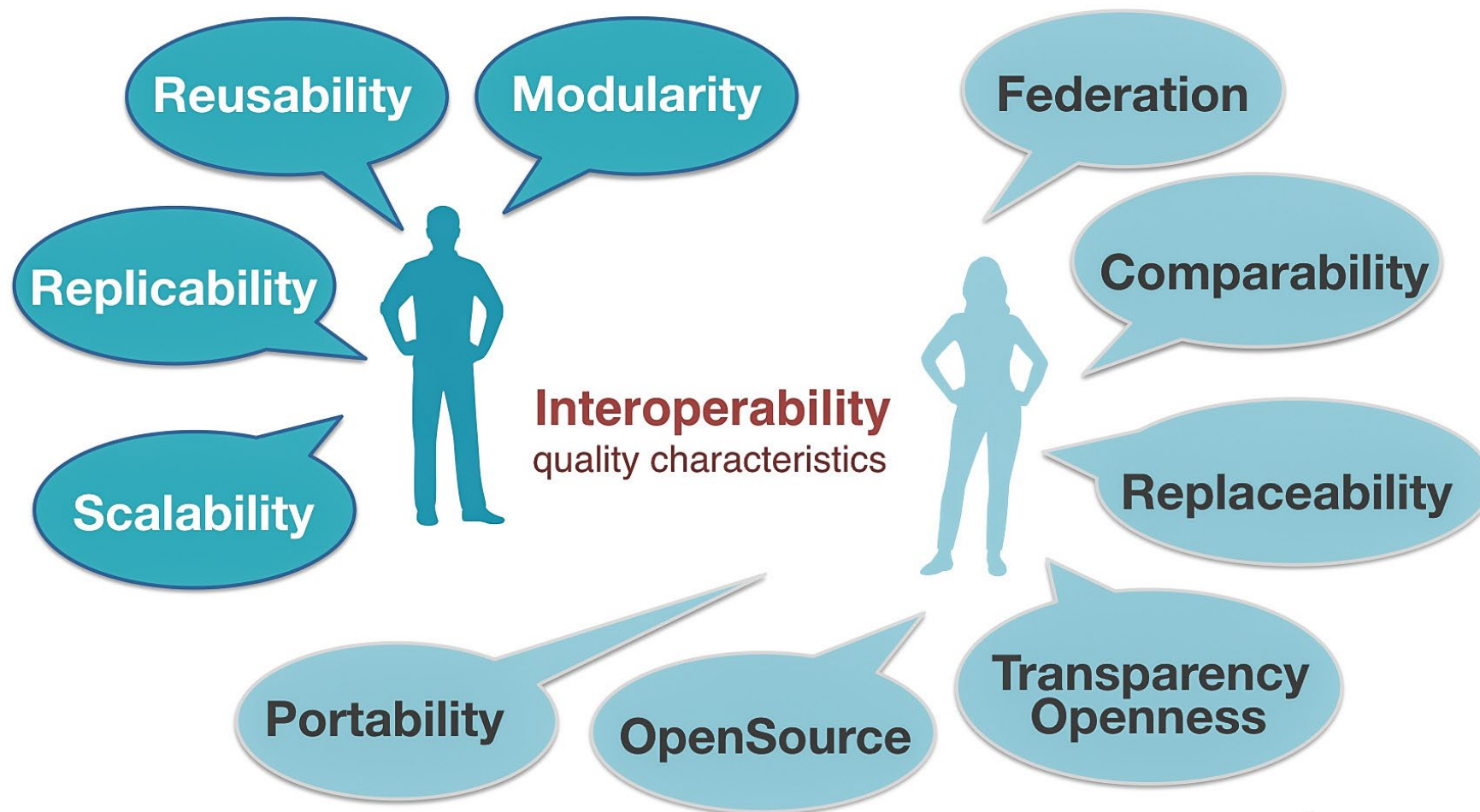Less than **10%** of European cities & communities using „open data" at all

Interoperability remains still a concept which is only partly achieved

Open Data Maturity
Report 2021

Fast Train

- Every year new kids on the block

- Data exists in / moves around

Silos	Cloud
Hub	Portal
Platform	Lake
Twin	Space

DATA SPACES DIALOGUE

**Mobility
Data Spaces in
the GAIA-X Context**

October 7, 2021
10 to 11 CET

INTERNATIONAL DATA SPACES ASSOCIATION

IDSA LIVE SESSIONS

GET RID OF DATA SILOS
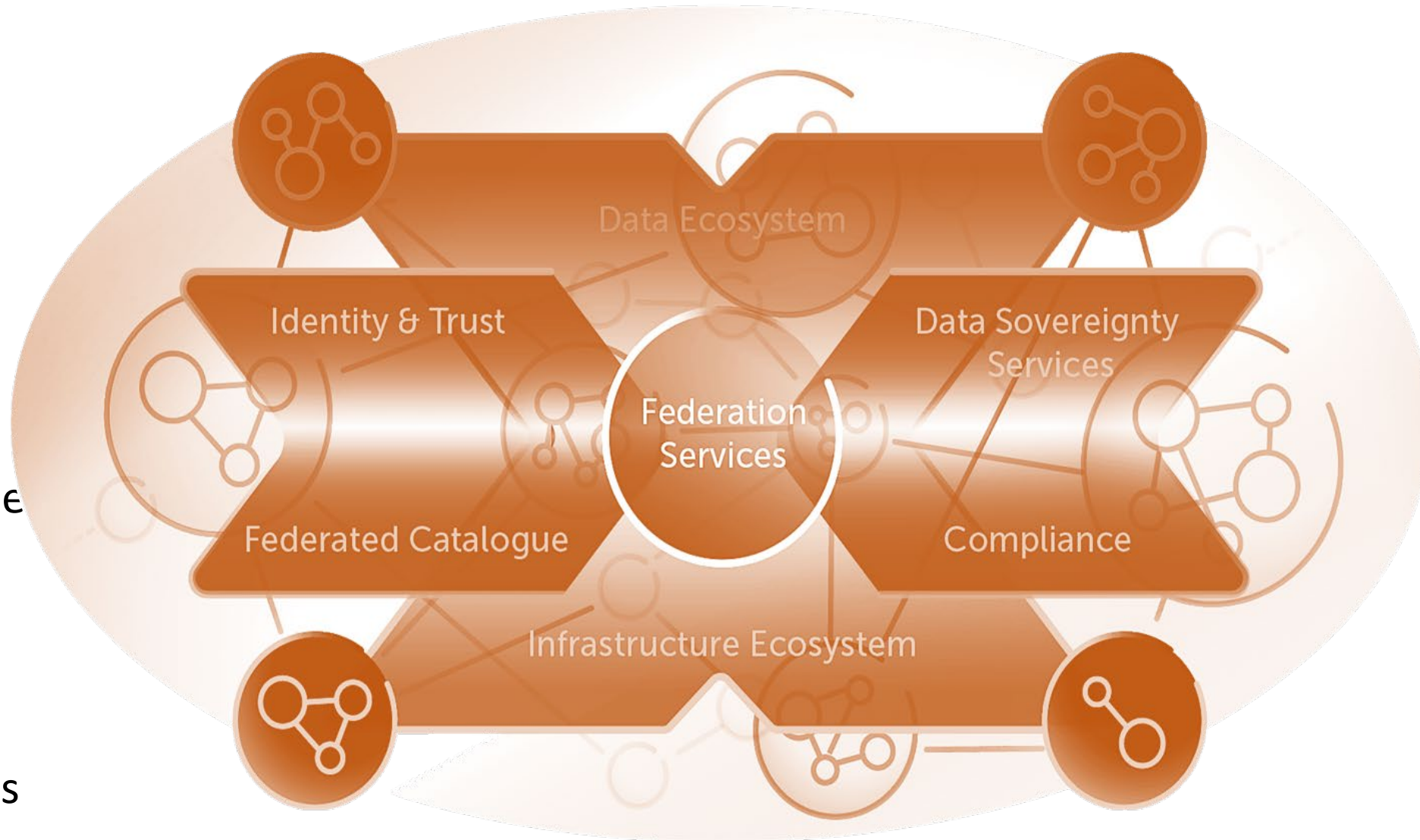
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Interoperability

- We aiming for interoperability since decades

- … on different levels / in various context

- Technical

- Organization

- Governance

- Cultural

- Semantic

- Legal

Cross X

- Cross silos
- Cross stakeholde
- Cross domain
- Cross country
- Cross legal
- Cross continents

ODALA (Open Data Lake)

Started as Lake, having ambitions to be

- DataSpace as specified via IDSA

- Reference to Gaia-X and myData principles

- Implementing couple of MIMs and CEF blocks

- Connected with other data in portals, spaces

- Federated cross domain and cross country

- Replicable and portable Open Source

Mobility

... a data case

Data exists in closed silos,
shared only with limitations

multiple standards apply,
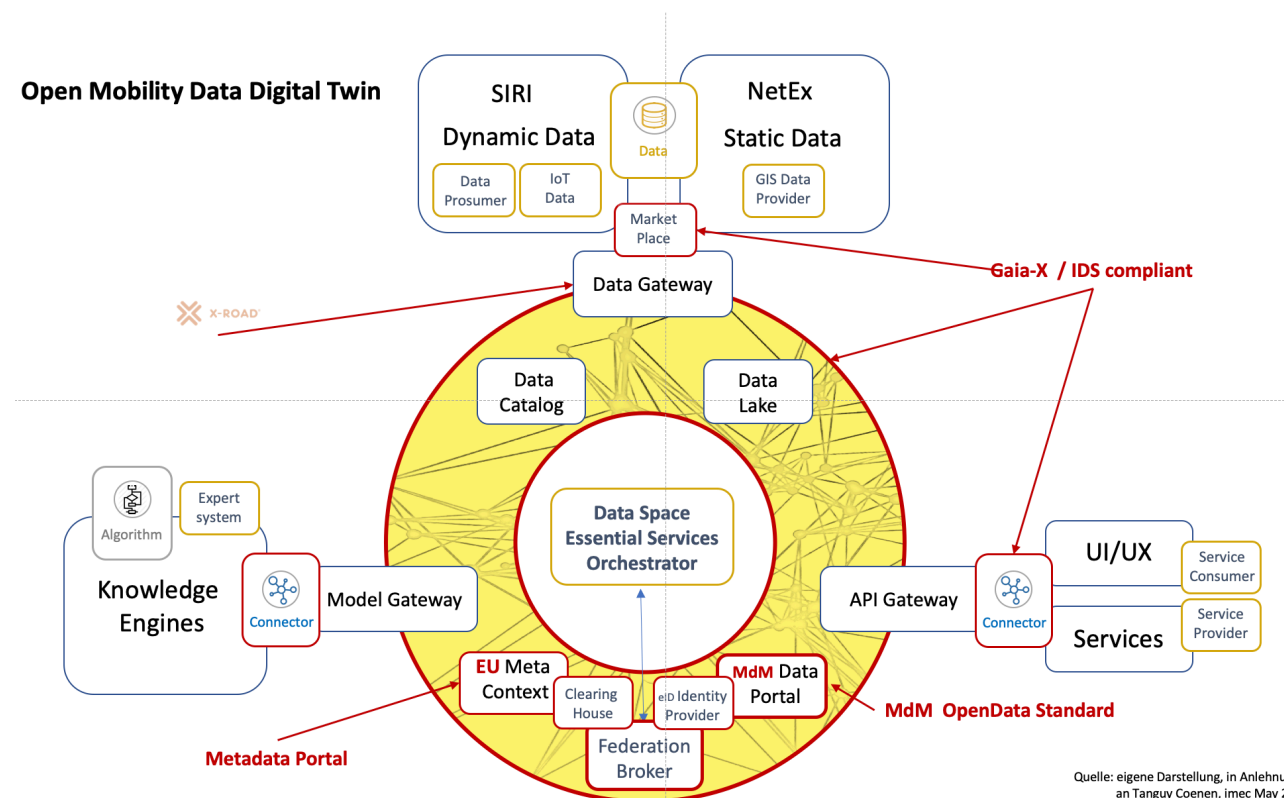semantics differ everywhere

stakeholders interests clashes
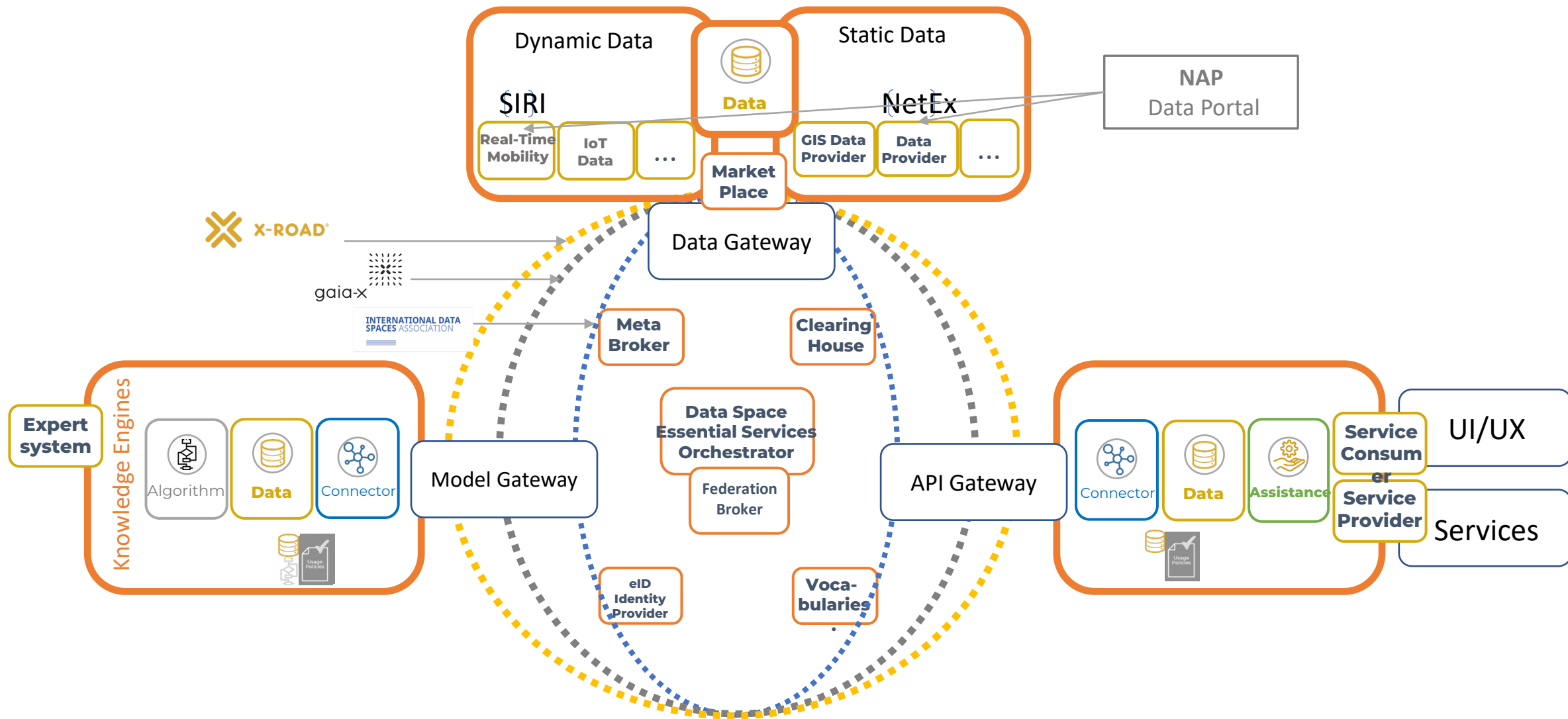digitalisation lacking behind

Architecture

... evolving

- Monolithic (all in one) versus Federation
- Cloud (Backend and Frontend)
- Microservices (layers and components)
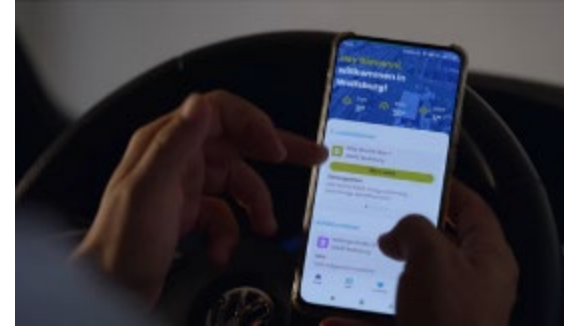- Knowledge Engines (microservices)

Open Mobility Data Digital Twin

Quelle: eigene Darstellung, in Anlehnung an Tanguy Coenen, imec May 2021

Topology DataSpace X for Mobility

BMW
Local Hazard Information

Caruso
Sustainable use of
of electric drives

FIWARE
Smart Parking

FREE NOW
Travel mode recommendation in accordance with weather conditions

highQ
AI-based optimisation of current mobility offers

Mercedes-Benz
"Parking Monitoring" and "Slippery Road"

[ui!] Urban Mobility Innovations
Information on capacity utilisation

Volkswagen
Local Hazard Information

The Smart Innovations Wheel

All Smart Urban Innovation types build on the capacity of city actors to lead and partner with other stakeholders to implement solutions. Cooperation is a fundamental element in generating any kind of Smart Urban Innovation.

Data is a fundamental tool for diagnosing a problem and for monitoring and evaluating the effectiveness of a solution. Don't forget to identify which data is most useful for your smart innovation and how you're going to collect and manage it while you're designing your innovation type.

Planetary boundaries

UNDP

Unpacking the Smart Innovations Wheel

Actors

A dominant actor often initiates and leads the delivery of the solution while collaborating with the other two actors.

Key roles of actors

The roles played by actors are contingent on a range of factors including whether or not they are leading the innovation, their contextual conditions and the nature of the issue being resolved.

Data and Information

The smartness of an innovation relies on the ability of actors to use data and information of the right nature, level and frequency to arrive at decisions throughout the solution's life cycle.
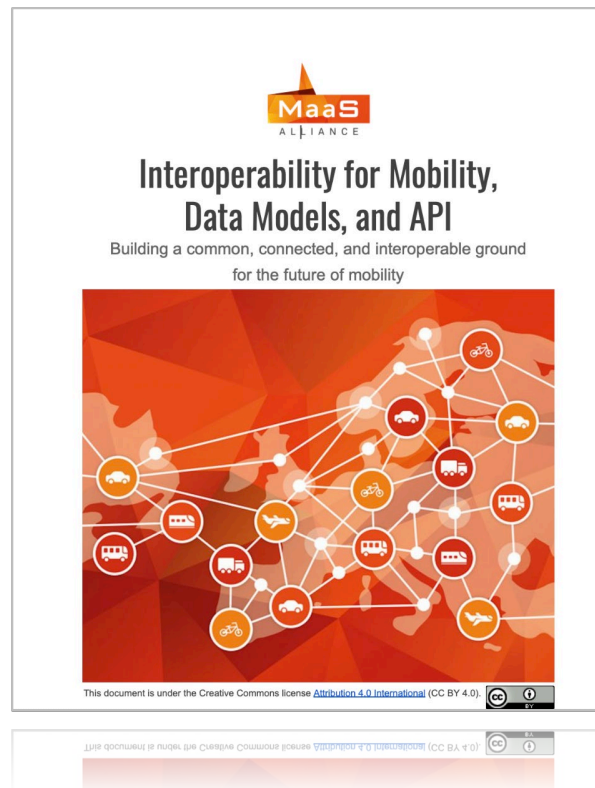
Tools

Actors use a range of tools that are well-suited to their context and to overcoming the challenge they seek to resolve.

Getting things on the ground

From innovation to procurement

Consensus Framework

PPI — Common Pivotal Points of Interoperability

Pre-Commercial Procurement — PCP

MIM — Common Minimum Interoperability Mechanism

Public Procurements of Innovative solutions — PPIs

MIOS — Common Minimum Information Interoperability Standards

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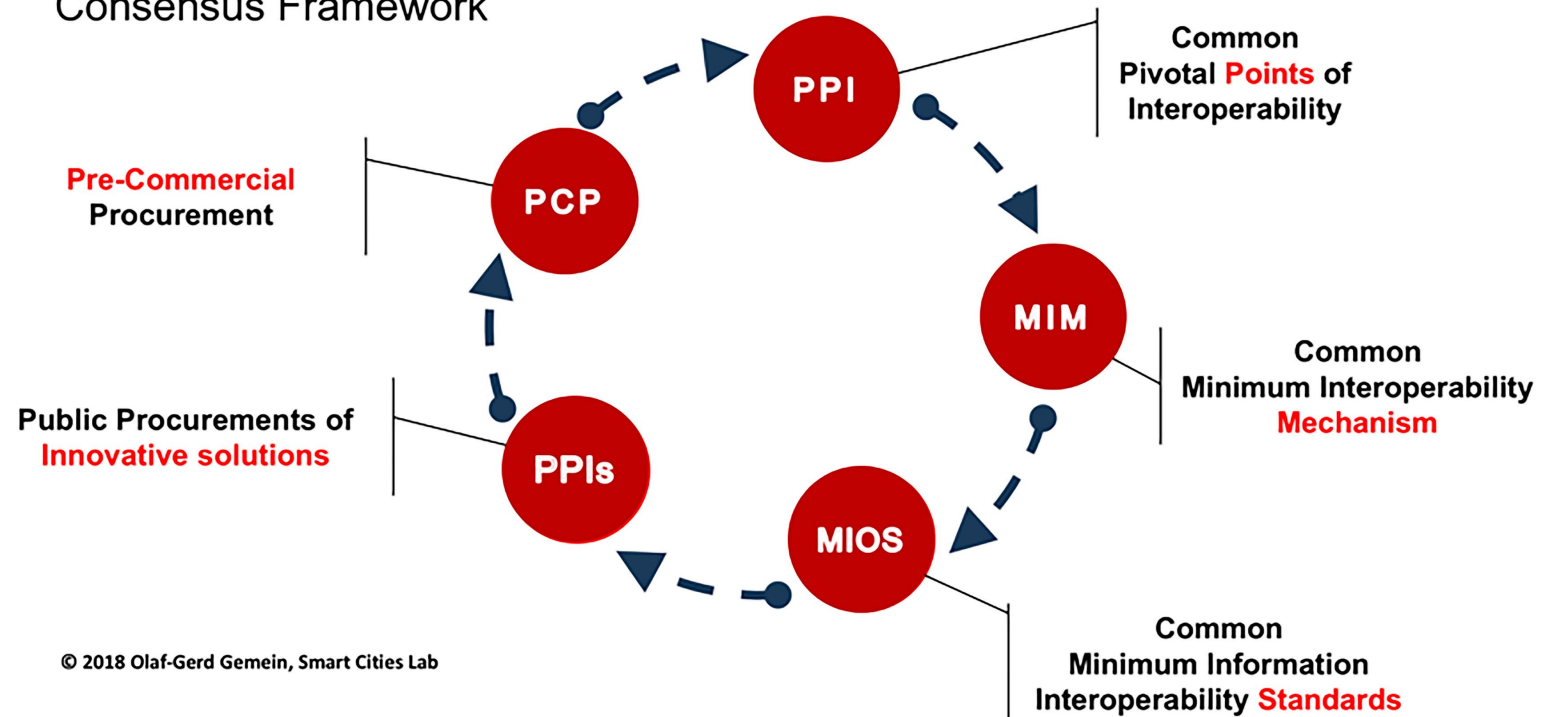
8 take aways

Just a starting point?

1	2	3	4	5	6	7	8
Procure smart based on MIMs	Cooperate with stakeholders	Use the Data Spaces specifications	Federate your ressources	Learn from best practices	Decouple Front and Backend	Build with Microservices	Decide on facts

~~8~~ 10 take aways

... adding at least 2

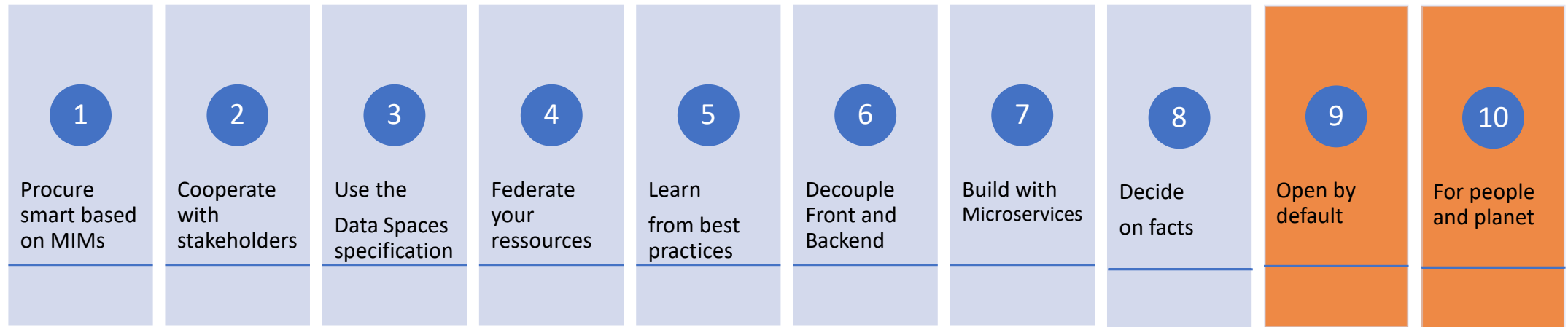|									
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Procure smart based on MIMs	Cooperate with stakeholders	Use the Data Spaces specification	Federate your ressources	Learn from best practices	Decouple Front and Backend	Build with Microservices	Decide on facts	Open by default	For people and planet

Thx.

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