ETSI

IoT and Edge computing as enabling technology for data spaces

Antonio Kung - Trialog

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Speaker

- ## CEO Trialog
  - IoT systems: Smart meters, Vehicle charging, Connected vehicles

- ## Standardisation
  - ISO/IEC, ISO, ITU-T, CEN-CENELEC, ETSI (through IRT SystemX)
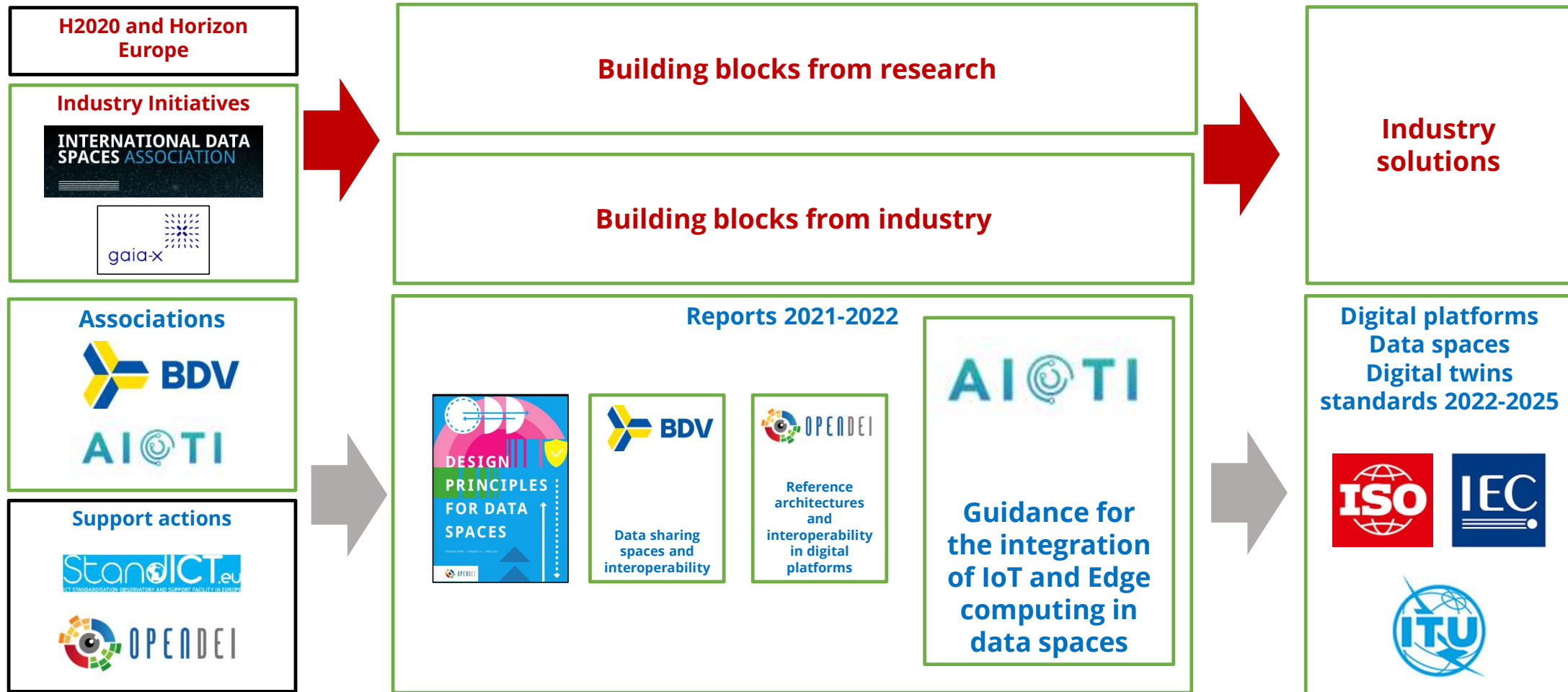 - Architecture, IoT, Digital twin, AI, Security and Privacy

- ## ISO/IEC JTC 1/SC 41 IoT and digital twin

- ## AIOTI
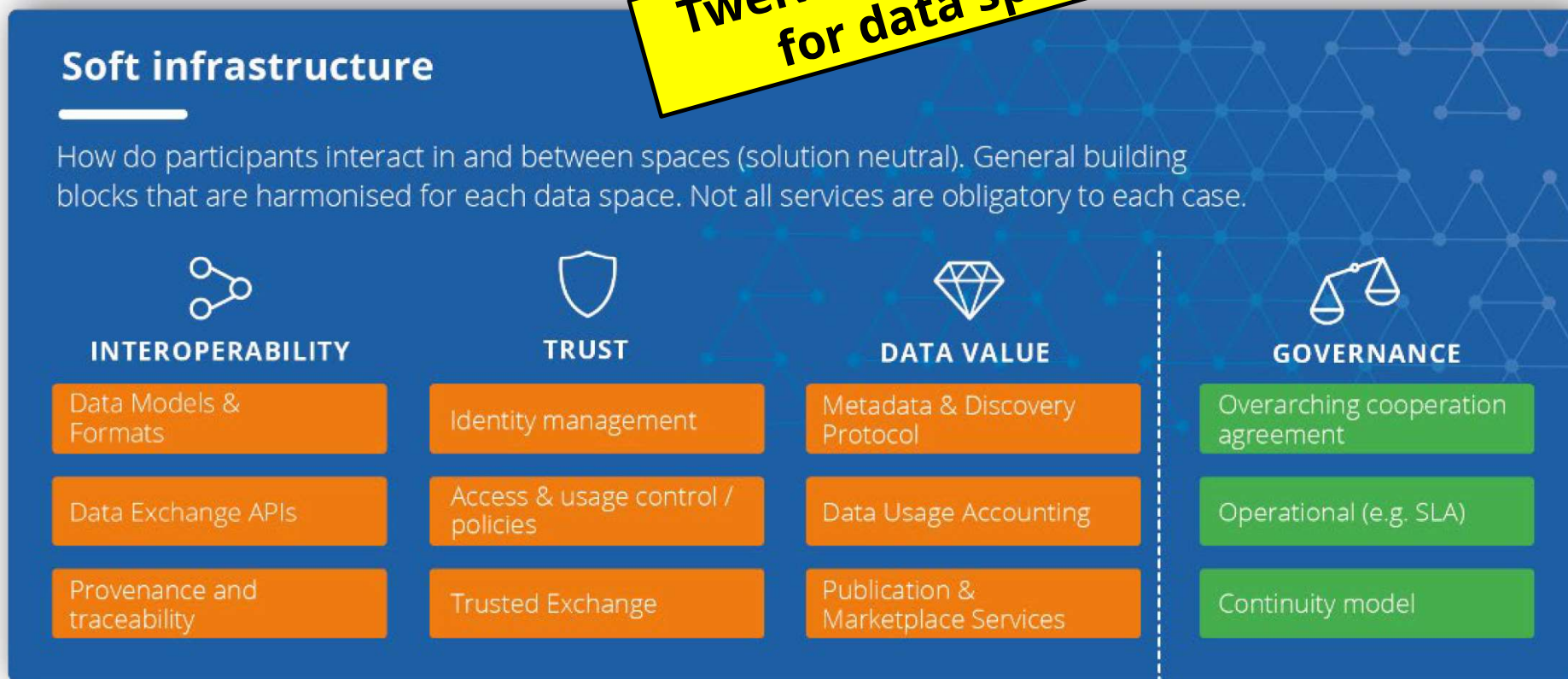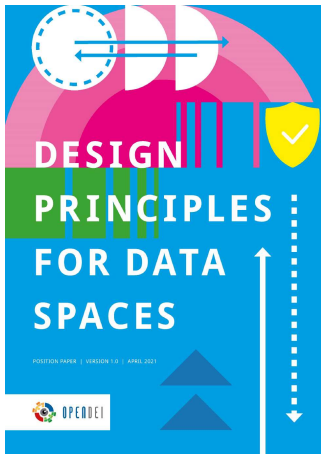 - Co-chair AIOTI WG3 Standardisation
  - Liaison officer AIOTI to JTC 1/SC 41

Context: Data Space Initiative for Standardisation

H2020 and Horizon Europe

Industry Initiatives

Associations

Support actions

Building blocks from research

Building blocks from industry

Reports 2021-2022

DESIGN PRINCIPLES FOR DATA SPACES

Data sharing spaces and interoperability

Reference architectures and interoperability in digital platforms

Guidance for the integration of IoT and Edge computing in data spaces

Industry solutions

Digital platforms Data spaces Digital twins standards 2022-2025

Context: Design Principles for Data Spaces

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Twelve building blocks for data spaces

DESIGN PRINCIPLES FOR DATA SPACES
POSITION PAPER | VERSION 1.0 | APRIL 2021
OPEN DEI

Soft infrastructure

How do participants interact in and between spaces (solution neutral). General building blocks that are harmonised for each data space. Not all services are obligatory to each case.

INTEROPERABILITY	TRUST	DATA VALUE	GOVERNANCE
Data Models & Formats	Identity management	Metadata & Discovery Protocol	Overarching cooperation agreement
Data Exchange APIs	Access & usage control / policies	Data Usage Accounting	Operational (e.g. SLA)
Provenance and traceability	Trusted Exchange	Publication & Marketplace Services	Continuity model

■ Technical Building Blocks   ■ Governance Building Blocks

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Context: Data Sharing Spaces and Interoperability

Data sharing spaces and interoperability BDVA

Draft white paper version for internal consultation

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Metadata interoperability in data spaces

Need for Metadata inventory

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Context: Reference Architectures and Interoperability in Digital Platforms

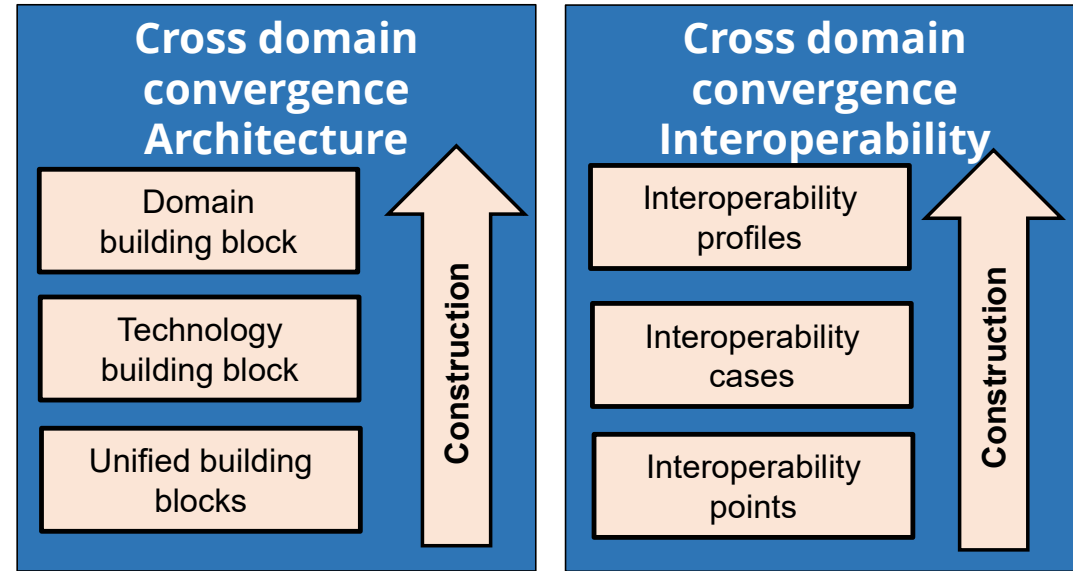**Final Event Workshop**
Brussels 27th October
https://www.opendei.eu/event/open-dei-communitys-success-celebration/

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OPENDEI

REFERENCE ARCHITECTURES AND INTEROPERABILITY IN DIGITAL PLATFORMS

Draft version 4.2
20 June 2022

Abstract

The document represents the result of a Task Force on Digital Platforms, Pilots and Standards which aims to create a framework to spur creative thinking, discussing and disseminating reflections and innovative proposals on the definition and the implementation of Reference Architectures, Interoperability Frameworks and Standards supporting the implementation of next generation European digital platforms in the four basic industrial domains Manufacturing Agriculture-Energy-Healthcare.

Construct architecture for cross-domain

Construct interoperability for cross-domain

Cross domain convergence Architecture

- Domain building block
- Technology building block
- Unified building blocks

Construction

Cross domain convergence Interoperability

- Interoperability profiles
- Interoperability cases
- Interoperability points

Construction

Alignment in 4 domains

Energy   Agriculture   Manufacturing   Healthcare

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Context: Standardization Actions for Data Spaces

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IoT and Digital Twins

- ISO/IEC JTC 1/SC 41
- Led by AIOTI
- Focus: the role of IoT and Edge in data spaces
- Creation of Advisory Group 31
  - Impact of standardization activities of other groups on S
  - Convenor (Antonio Kung)
  - Liaison with ITU-T SG20

Artificial Intelligence

- ISO/IEC JTC 1/SC 42
- Led by BDVA
  - Towards a family of data space related standards

Establishment of an AG on Impact of standardization activities of other groups on SC 41

416.	Noting

Noting
1. AIOTI request to address topics on the impact of AI / data on IoT and digital twin (SC 41 N2003),
2. Support from France, Ireland, Norway, Finland, Korea, US, Switzerland, Spain, Germany,
3. Interest of the ITU-T SG20 liaison officer, and
4. Sweden request to ensure proper management of external liaisons

JTC 1/SC 41 instructs its Committee Manager to do whatever is required to create an advisory group on Impact of standardization activities of other groups on SC 41

Convener: Antonio Kung (France)

Terms of reference:
- Using the SC41 liaison list, interact with liaison groups (or liaison officers where there is no liaison group) to help identify standards, organizations and topics of interest to SC 41 and maintain a catalogue of such information.
- Take into account topics suggested by SC 41 N2003: AI and data as well as sensor data quality management issues identified in SC 41 N2032
- Provide recommendations on how to address the impact of those standards and topics to SC 41
- Present a consolidated report of activities at each SC 41 plenary

The AG is open to all experts of SC41. The initial members are
- Osten Franberg (SE)
- Ray Walshe (IE)
- Jaeho Lee (KR)
- Asbjoern Hovsto (No)
- Raul Garcia (ES)
- Jan deMeer (DE)
- Alex Samarin (CH)
- Kate Grant (GB)
- Karim Tobich (GB)
- Marco Carugi (ITU-T SG20 liaison officer).
- Sushil Kumar (IN)
- Gargi Keeni (IN)

IoT and Edge Computing as Enabling Technology for Data Spaces

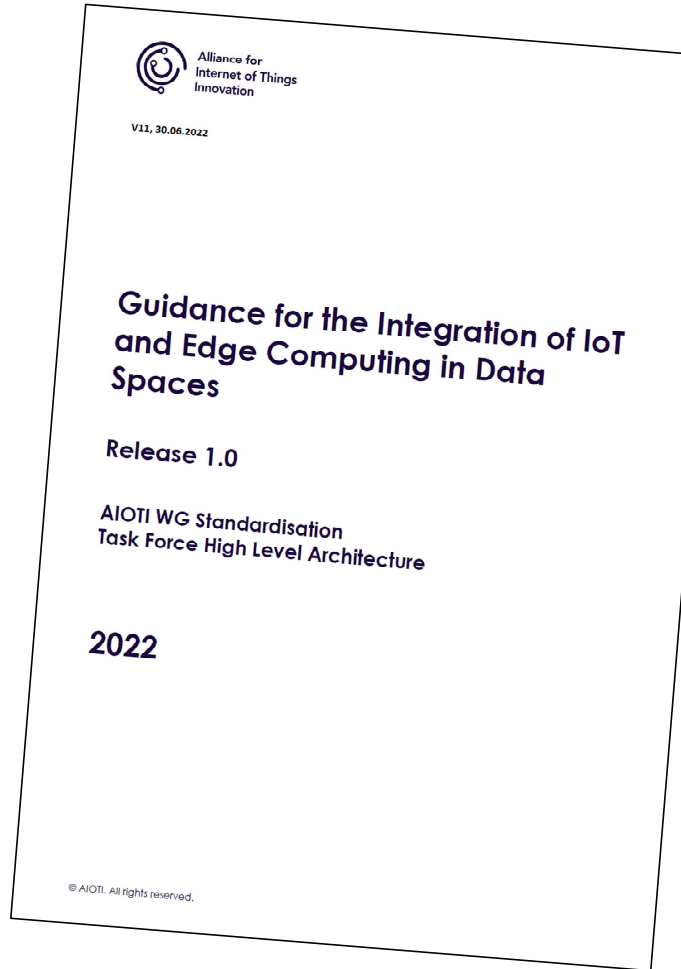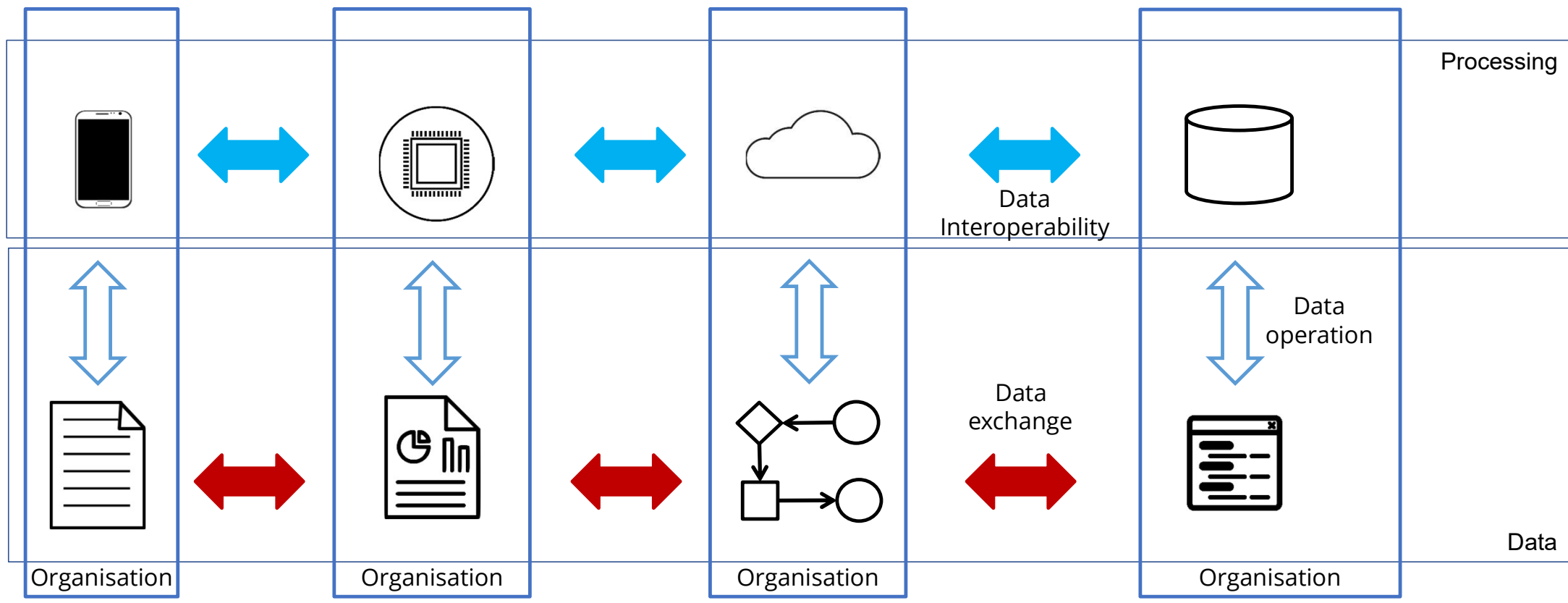https://aioti.eu/wp-content/uploads/2022/09/AIOTI-Guidance-for-IoT-Integration-in-Data-Spaces-Final.pdf

Alliance for Internet of Things Innovation

V11, 30.06.2022

Guidance for the Integration of IoT and Edge Computing in Data Spaces

Release 1.0

AIOTI WG Standardisation
Task Force High Level Architecture

2022

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Webinar: Promotion of Guidance for the Integration of IoT and Edge Computing in Data Spaces
Wednesday, 23 November 2022
15:00 – 16:30

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Data Space: Trustworthy Decentralized Environment for Data Sharing

Processing

Data Interoperability

Data operation

Data exchange

Data

Organisation | Organisation | Organisation | Organisation

Continuum processing

Processing

Data exchange

Data operation

Data Interoperability

Data

IoT Devices

Edge

Cloud
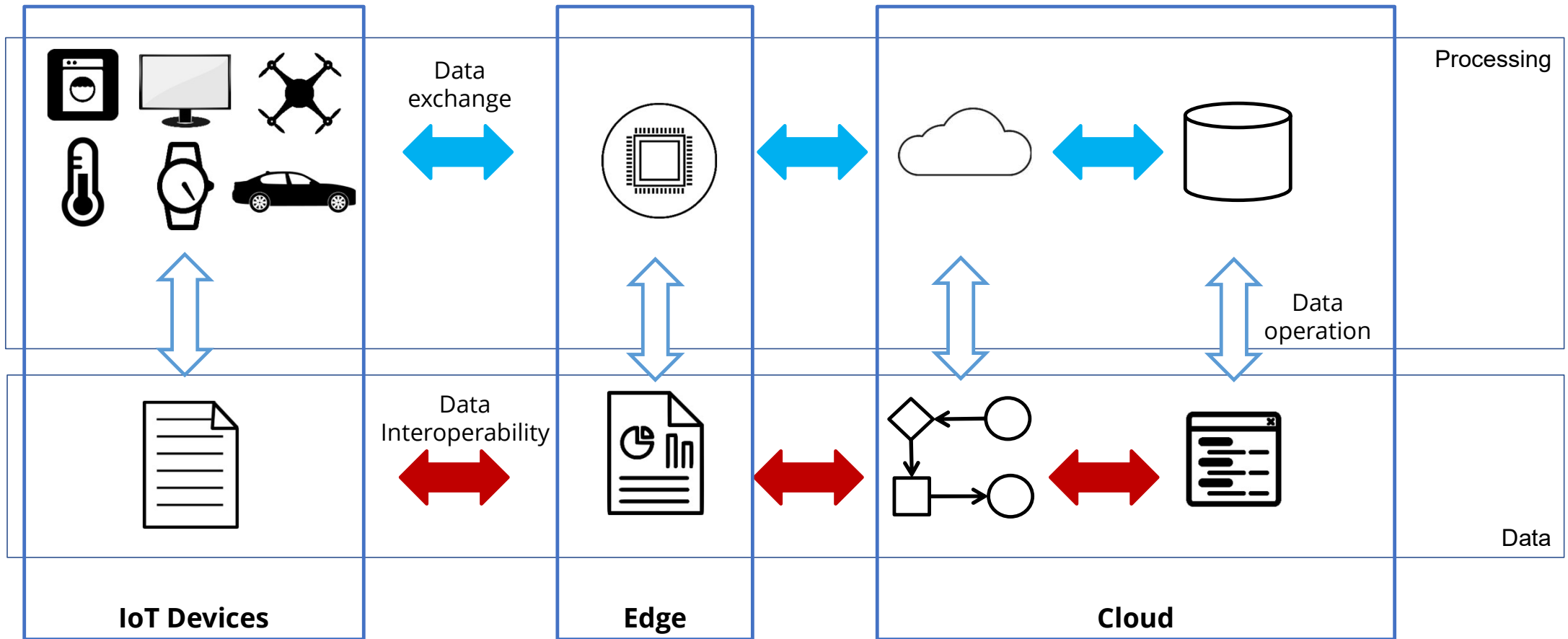
Federated Systems Perspective of Data Spaces
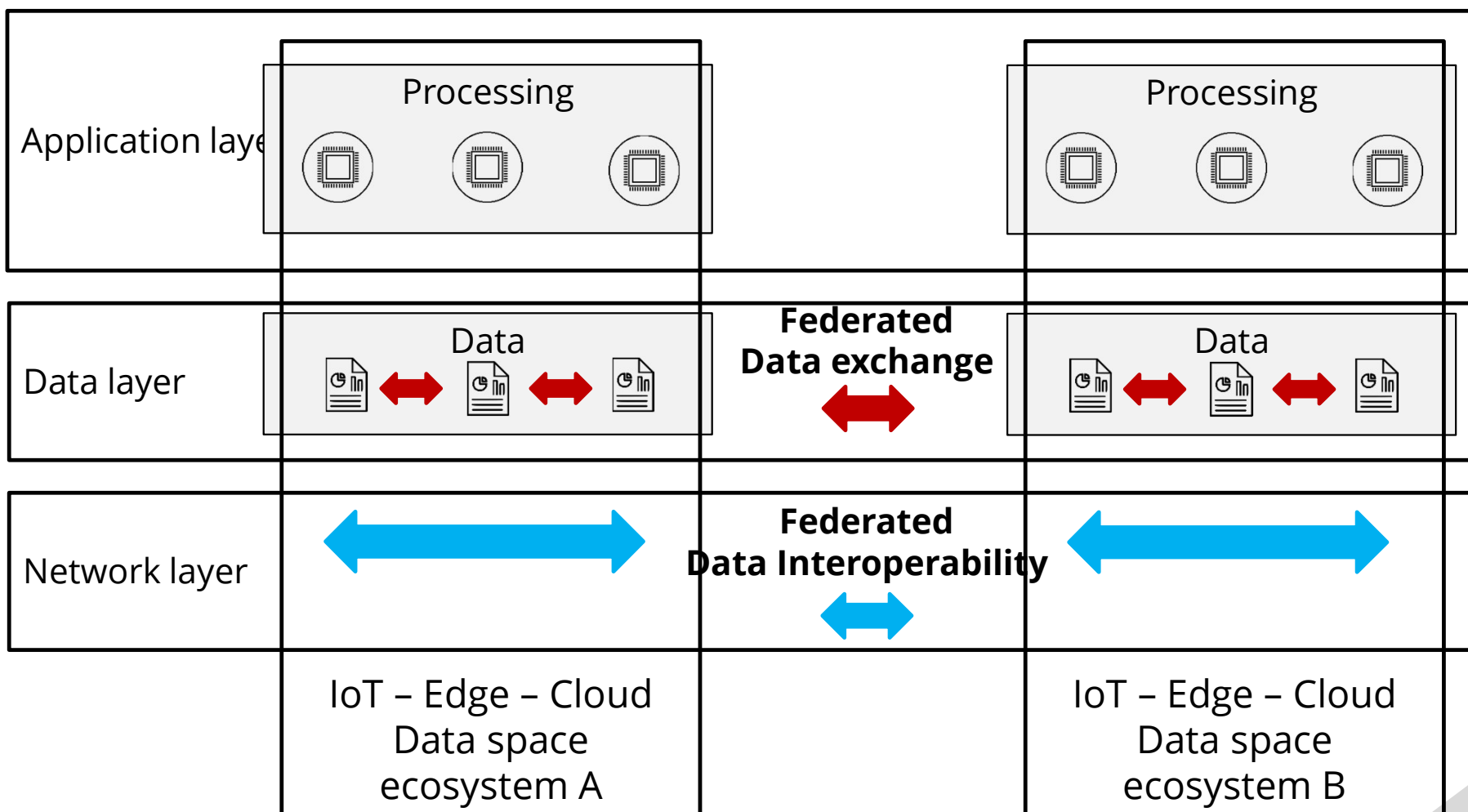
Building a Data Space Architecture Integrating IoT and Edge

Reference architecture Common models

IoT and Edge models	Data space models

Reference architecture patterns

IoT and Edge patterns	Data space patterns
Energy SGAM pattern	Smart manufacturing RAMI pattern

Solution architecture construction

Solution architecture construction

Solution architecture

IoT and Edge + Data space + Domain solution architecture
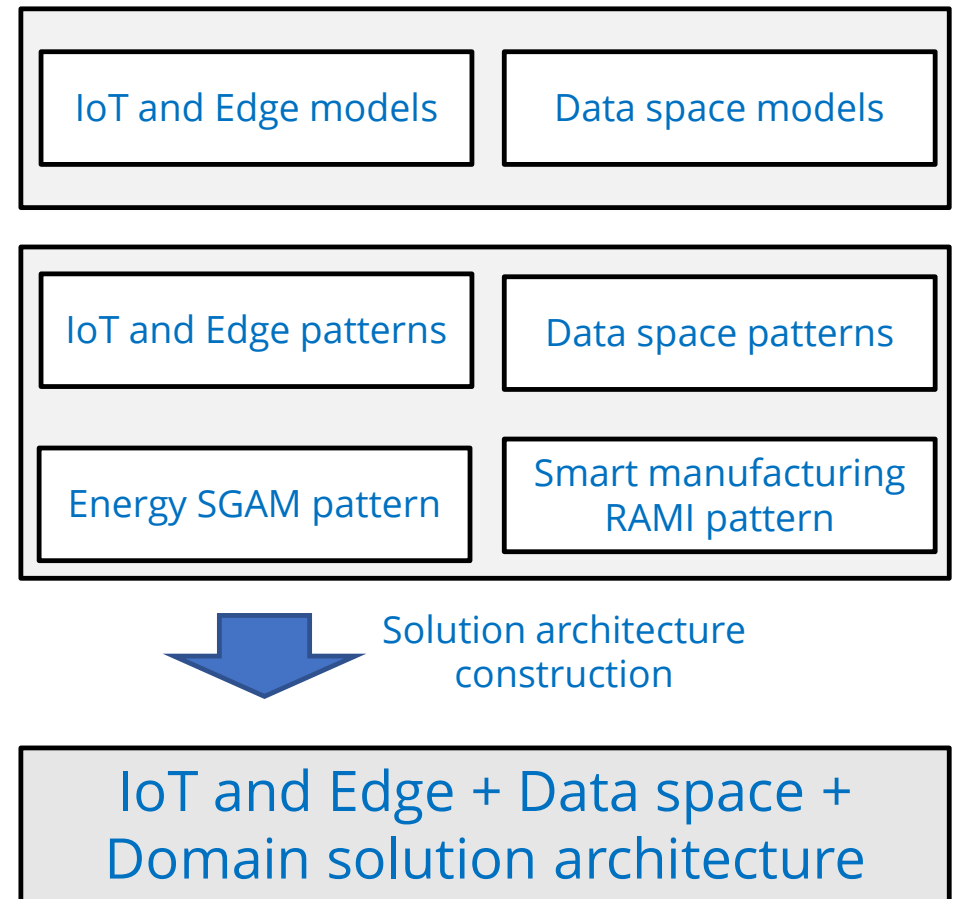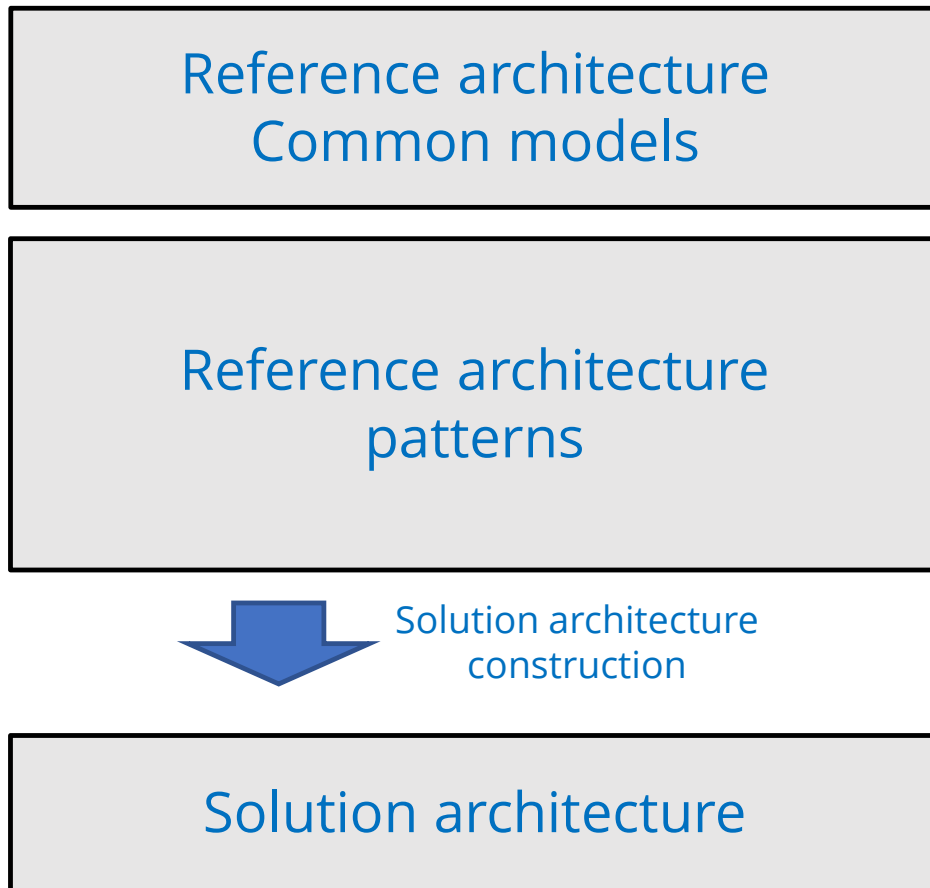
Solution Architectures and Projects

- IDSA Reference Architecture

- OneM2M

- ETSI MEC

- Flying Forward 2020 (Spatial Web Architecture)

- Platoon

- Interconnect

- SmartBear

- Assist-IoT

# Recommandation 1: Data Space Principles

1	Data spaces are **ecosystems of systems**
2	Data usage require provisioning from **connecting devices**
3	Data spaces support data lifecycle
4	Data interoperability enabled by a common language
5	Data usage enabled by common data models
6	Data curation
7	Trust in data sharing
8	Governance for ethical usage of data
9	**Decentralisation**
10	Integrated data management
11	Extensible data spaces
12	User-centricity

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Recommandation 2: Architecture of standards for data spaces
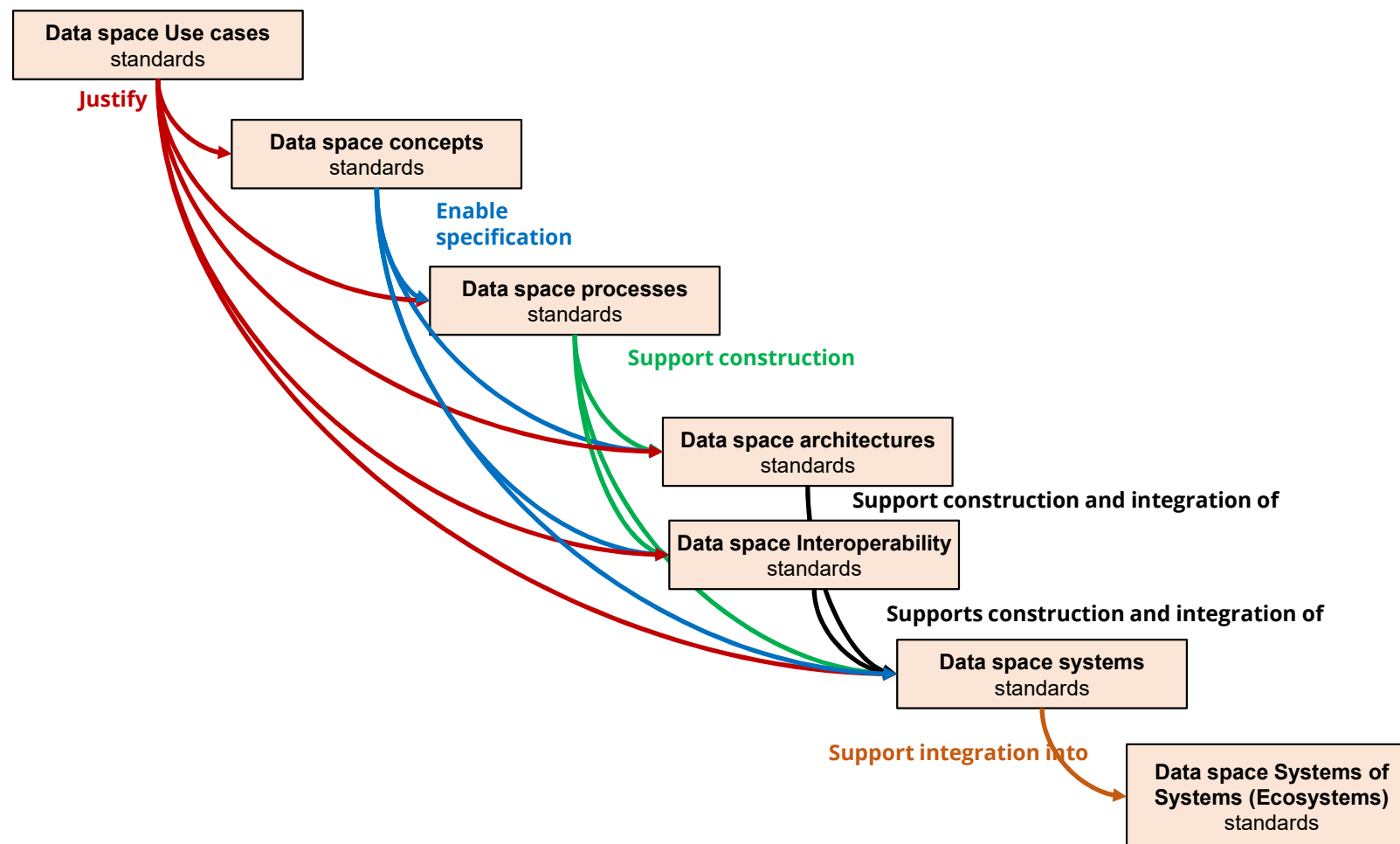
Recommandation 3: Integration of IoT and Digital twins in Data Spaces

- Integrate IoT, Edge and digital twin concerns in data space standards

- Standards should be jointly worked out by working groups focusing on
  - AI
  - Data
  - Data governance
  - IoT
  - CPS
  - Digital twins

Thanks

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