Data Frameworks

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Data Economy, Platforms, Ecosystems

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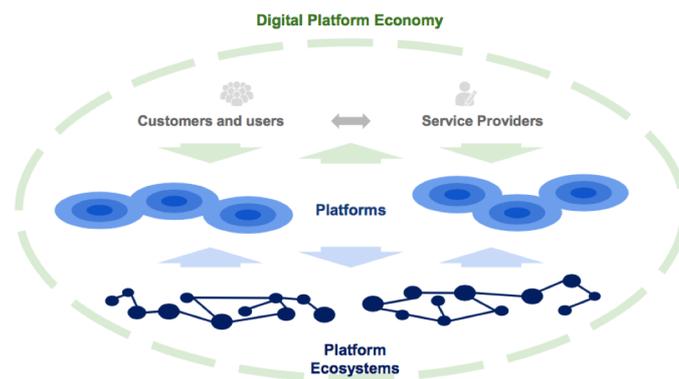
Data Frameworks

Frameworks or Architectures are not end-solutions, rather than approaches to manage complexity and provide common rules & technical specifications

Standards are prerequisite for *technical integration* and semantic interoperability between different systems and parties

***Process templates* and *Business rules* needed for higher level abstractions and meaningful operations**

→ create shared understanding, meaning and trust

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Data Frameworks

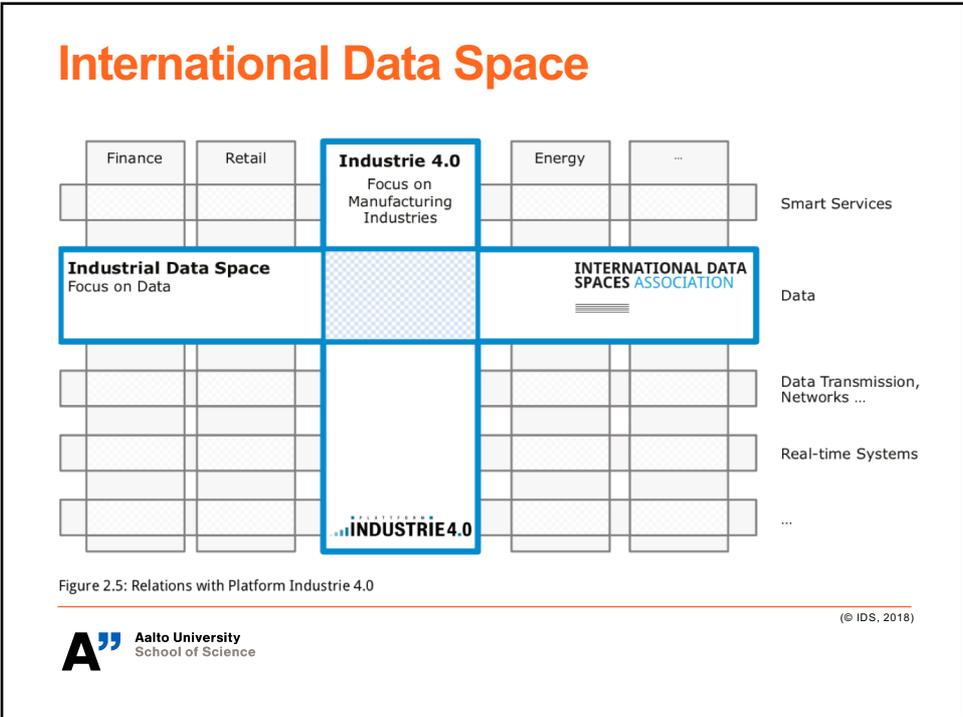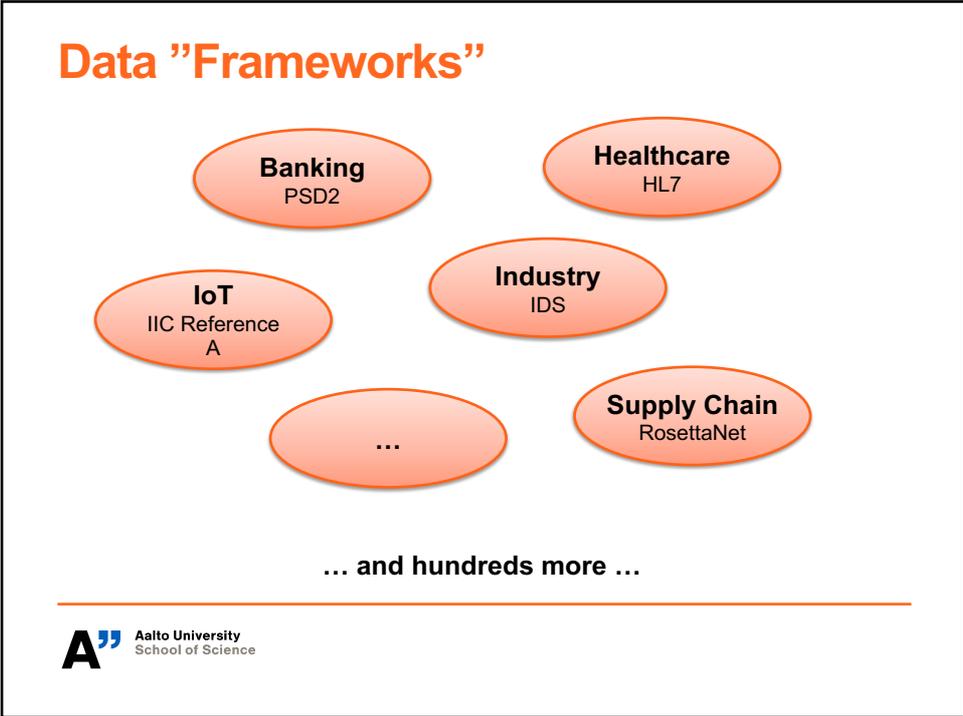| **Business**	• Policies, guidelines • Business rules • Data ownership
Processes	• Template processes • Choreography • Harmonization
Semantic	• Data interoperability • Common meanings • Meta data
Syntactic / Technical	• Technical interfaces • Data formats / syntax • API's

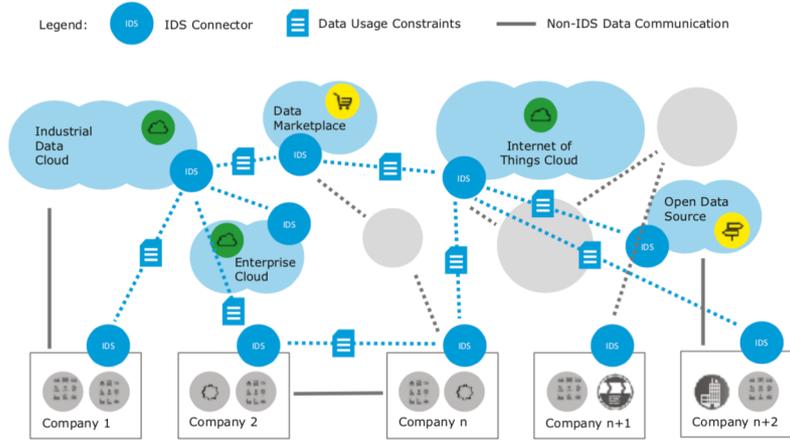**Aalto University**
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Data "Frameworks"

Banking
PSD2

Healthcare
HL7

IoT
IIC Reference A

Industry
IDS

…

Supply Chain
RosettaNet

… and hundreds more …

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International Data Space

Finance	Retail	**Industrie 4.0** Focus on Manufacturing Industries	Energy	…	Smart Services
Industrial Data Space Focus on Data			**INTERNATIONAL DATA SPACES** ASSOCIATION		Data
					Data Transmission, Networks …
					Real-time Systems
		.ıı INDUSTRIE 4.0			…

Figure 2.5: Relations with Platform Industrie 4.0

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Figure 2.4: Industrial Data Space and Cloud Platforms

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Smart Service Scenarios					
Automobile Manufactures	Electronics and IT	Service	Logistics	Mechanical and Plant Engineering	Pharmaceutical and Medical Supplies

Architecture Level	
	Service and Product Innovations
	Smart Data Services (alerting, monitoring, data quality, etc.)
	Industrial Data Space
	Basic Data Services (information, fusion, mapping, aggregation, etc.)
	Internet of Things – Broadband Infrastructure – 5G
	Real-time Scenarios – Sensors and Actuators – Devices

Figure 2.3 Typical enterprise architecture stack

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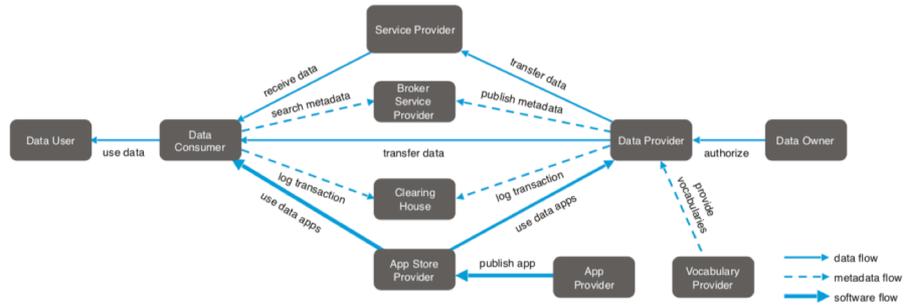
Figure 3.1: Roles and interactions in the Industrial Data Space

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International Data Space

Business Layer / Roles
- Data owner, provider, consumer
- Broker Service, Clearing House
- Services: Indentity, App & App Store
- Vocabulary, Software Dev.

App Ecosystem
- Data App Dev & Provision

Process Layer
- Data provision, exchange
- Publishing & using data & apps

Functional Layer
- Trust & Security, Governance
- Connectors; Data Exchange, Data Processing & Transformation
- Vocabulary & Metadata

Identity Management

Clearing House
- 3rd Party Logging, Audit Trails

Information Layer

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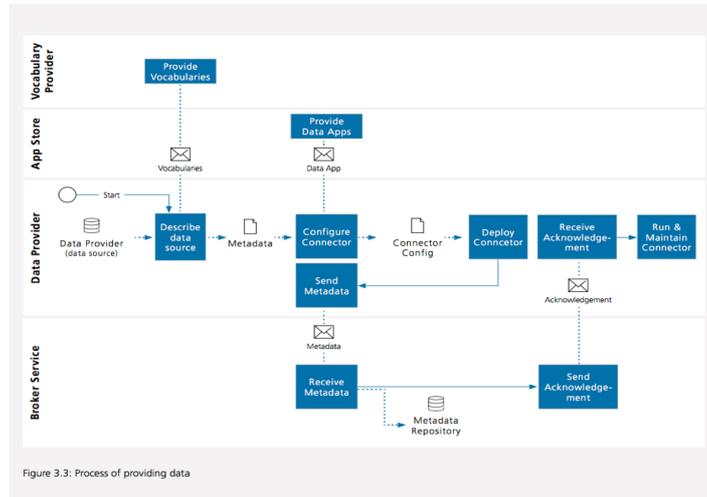
Figure 3.3: Process of providing data

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