ONTO COMMONS
ONTOLOGY-DRIVEN DATA DOCUMENTATION FOR INDUSTRY COMMONS

Industry Commons

Towards a Common European Data Space

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Origins of the Industry Commons

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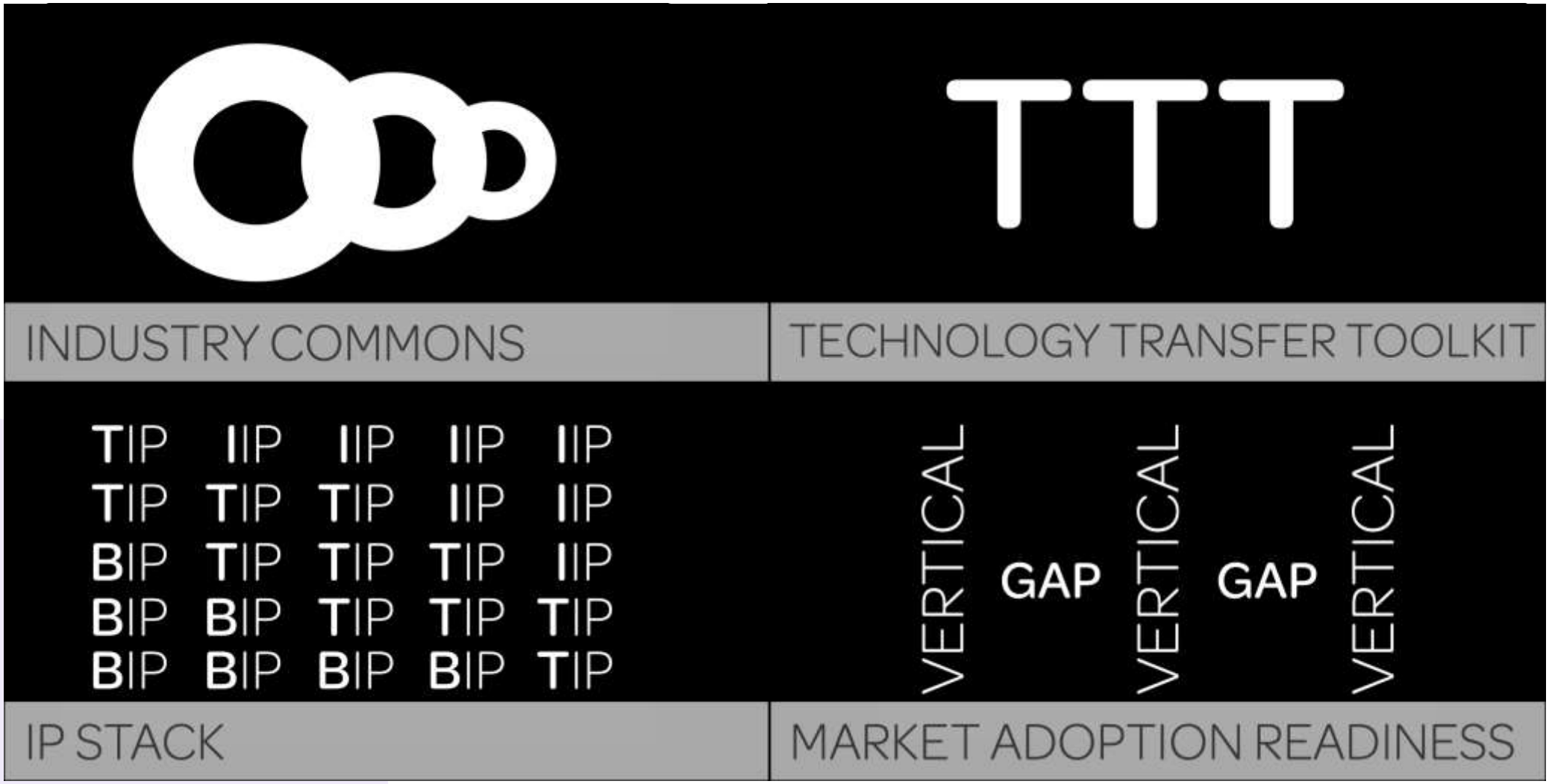

IC Requirements: a commons with agency

Traditional models of the commons are:

- derived from systems where land ownership is the dominant power structure;
- the common resource is presented as finite creating an economy of scarcity;
- **actors are stripped of agency.**

Elinor Ostrom: "By referring to natural settings as tragedies of the commons, collective action problems, prisoners dilemmas, open access resources, or even common property resources, the observer frequently wishes to evoke images of helpless individuals caught in an inexorable process of destroying their own resources."

- => IC **requires agency of the involved actors** (in terms of data sovereignty, decision making powers, distributed governance)

IC Requirements: valorisation of knowledge exchange

- In the examples critiqued by Ostrom, actors are stripped of knowledge, domain specialism or ability to make a valuable (e.g. unique, novel or resourceful) contribution.
- Cooperation is a necessity when individual contributors bring knowledge that is needed by the group or enhances their collective capabilities. *(This is why cattle grazing is a very poor metaphor for spaces for knowledge exchange)*
- Bringing knowledge together from various domains is therefore essential for common incentives and motivations.
- => IC **requires support for the valorisation of knowledge exchange**.

IC Requirements: progress from Enterprise Integration to Ecosystem Integration

Industry Commons builds on the assumption that sustainable cross-domain industrial innovation can be achieved when all aspects of Enterprise Integration are:

- sufficiently **transparent** to allow all involved actors to be proactive in their decision-making workflows;
- technologically **harmonised** to allow interoperability between involved actors' technological components;
- effectively **supported** by responsible societal and environmental parameters embedded in the system.

Industry Commons Ecosystem

INTEROPERABILITY (ONTOCOMMONS)

SYSTEMS OF AGREEMENTS (FROM INTERNATIONAL REGULATION TO PEER-TO-PEER CONTRACTS)

SYSTEMS OF RESILIENCE (ENVIRONMENTAL SUSTAINABILITY AND BLACK SWAN EVENT RESILIENCE)

SYSTEMS OF RESPONSIBILITY (CSR, RESPONSIBLE AI, WORK ETHICS)

SYSTEMS OF BELIEFS (SOCIETAL VALUES)

Industry Commons Ecosystem

BREAKTHROUGH INNOVATION

(MODELLING OF CURRENT AND EMERGING MARKET POSSIBILITIES)

INTEROPERABILITY (ONTOCOMMONS)

SYSTEMS OF AGREEMENTS (FROM INTERNATIONAL REGULATION TO PEER-TO-PEER CONTRACTS)

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IC properties: from SoS to Cross-Domain Ecosystems

Properties of the Cross-Domain Ecosystem, building on Weichhart, Panetto and Molina, 2021:

- **Autonomy** allows for an increase in dynamic states for greater modularity and adaptability.
- **Belonging** is decentralised but closely monitored and tracked across the ecosystem. Market competitiveness is balanced by the ecosystem's supra purpose, encoded in the social dimensions.
- **Connectivity** is considered to be all-pervasive rather than a series of nodes and synapses. The value networks operate simultaneously in several dimensions creating value ecosystems.
- **Diversity** of capabilities is key to enabling innovation breakthroughs and therefore encouraged. Diverse ecosystem-oriented modules are open and ecosystem-facing, for modelling and coupling on the fly.
- **Emergence** is closely monitored and trackable throughout the ecosystem allowing for detection of breakthrough innovation, leading to informed decision-making, investment and resource allocation.

IC synergies: Materials and Manufacturing Commons

- For the **modelling of Green Deal use cases** there should be data about all available materials and products from suppliers, so that it can be modelled together with the use case specific environmental and framework conditions (incl. regulation etc).
- Access to Materials and Manufacturing Commons is essential for the **procurement** of the most suitable materials/products, and for their **lifecycle management** (including tracking of data / passports across domains).
- For use across domains, data standardisation, and specifically **top level metadata standardisation** to make all materials and manufacturing data FAIR, should be a priority.
- M&MC can support IC **decision making processes** about the best performing / most resilient / most sustainable material/product, and provide a direct route to the industrial supplier.
- IC is an enabler for M&MC to connect to / **interoperate with other domains** including possibly a "Legal Commons" for regulation, or an "Environmental Commons" of public monitoring of environmental conditions for industrial applications.

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Thank you

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