IDS – DEMONSTRATION, APPLICABILITY FOR INDUSTRY AND LOGISTICS AND NEXT STEPS

TNO

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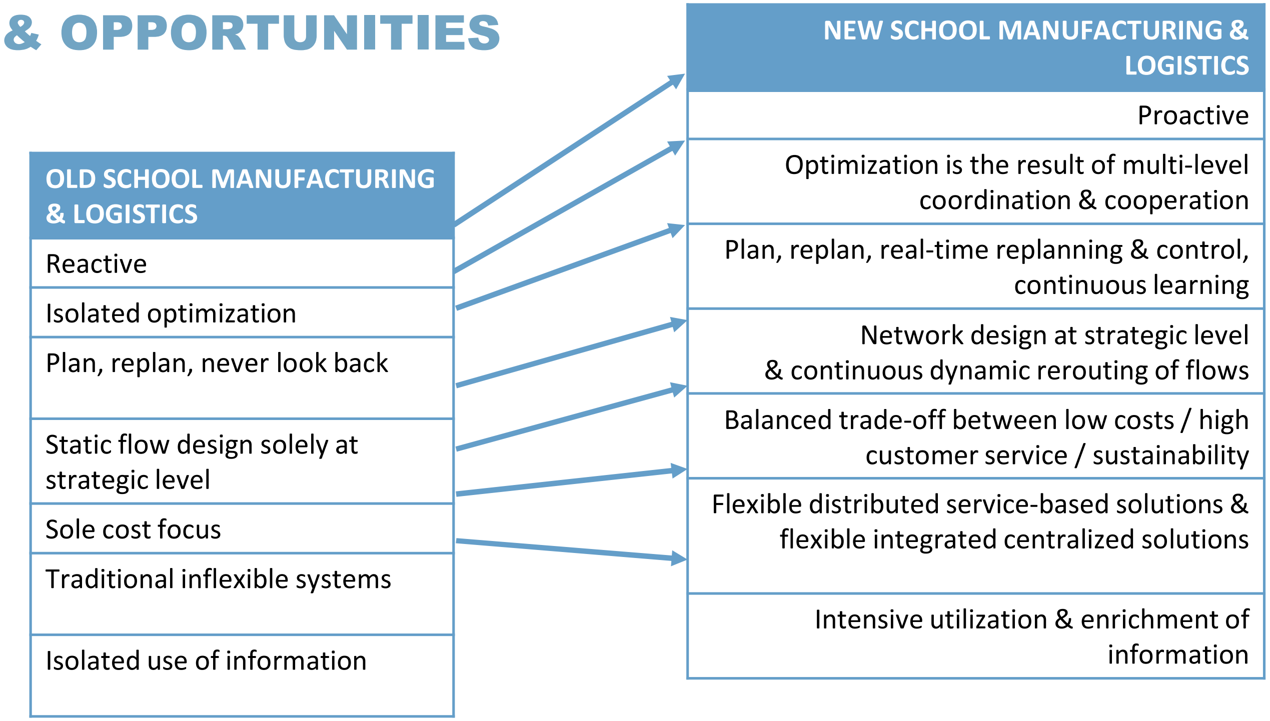
CHALLENGES & OPPORTUNITIES



OLD SCHOOL MANUFACTURING & LOGISTICS

- Reactive
- Isolated optimization
- Plan, replan, never look back
- Static flow design solely at strategic level
- Sole cost focus
- Traditional inflexible systems
- Isolated use of information

NEW SCHOOL MANUFACTURING & LOGISTICS

- Proactive
- Optimization is the result of multi-level coordination & cooperation
- Plan, replan, real-time replanning & control, continuous learning
- Network design at strategic level & continuous dynamic rerouting of flows
- Balanced trade-off between low costs / high customer service / sustainability
- Flexible distributed service-based solutions & flexible integrated centralized solutions
- Intensive utilization & enrichment of information

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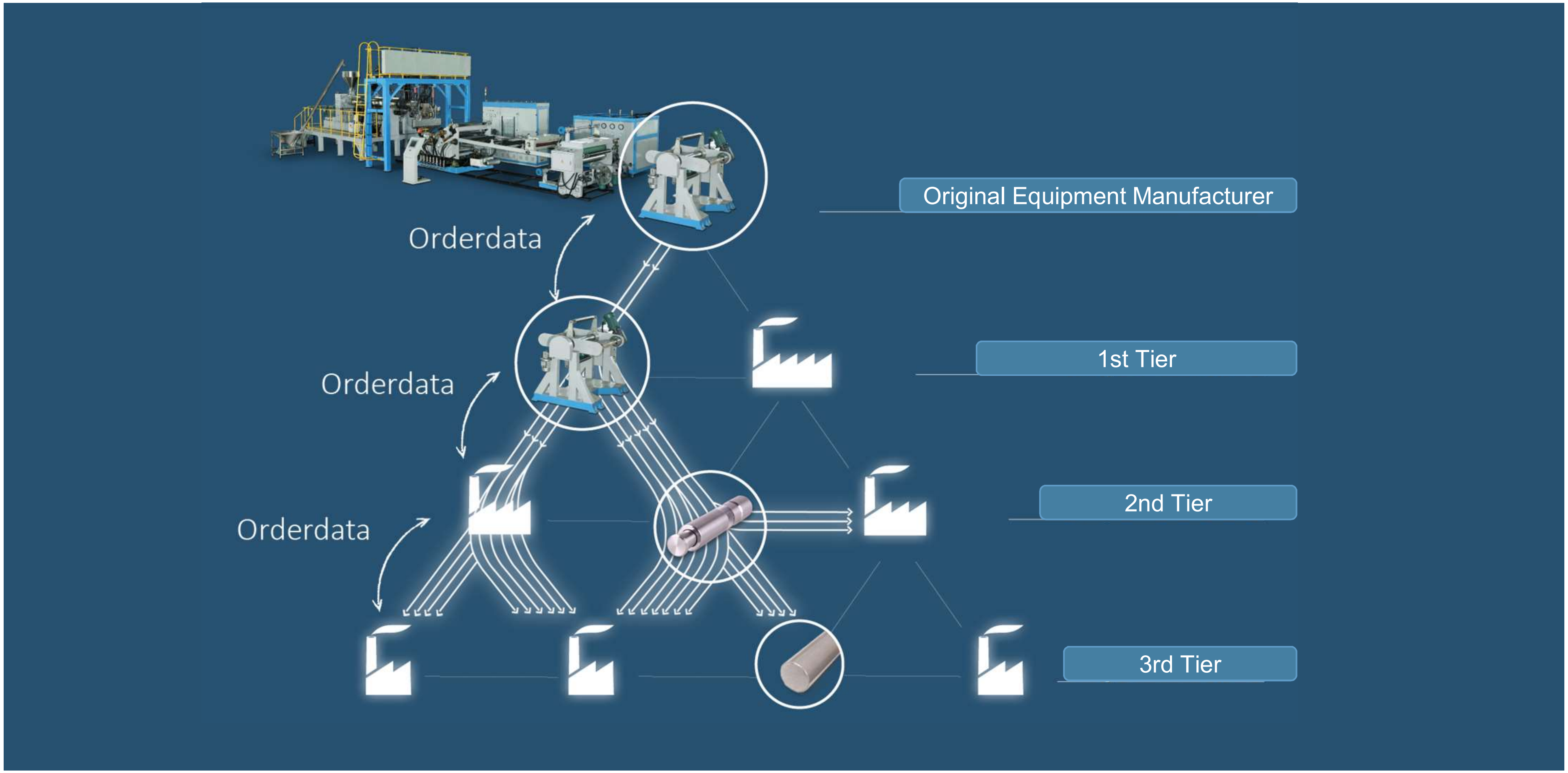

Orderdata

Orderdata

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Original Equipment Manufacturer

1st Tier

2nd Tier

3rd Tier

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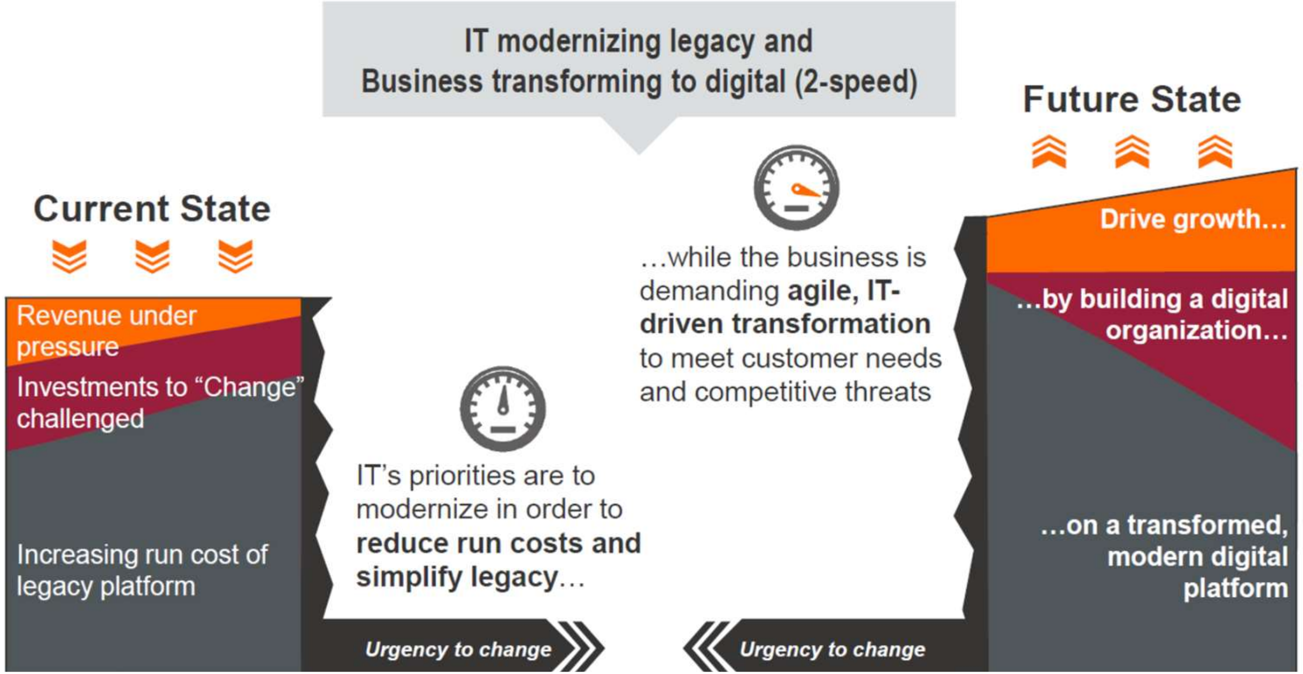
THE GAP BETWEEN BUSINESS & TECHNOLOGY PRIORITIES IN AN ORGANIZATION



IT modernizing legacy and Business transforming to digital (2-speed)

Current State

Revenue under pressure

Investments to “Change” challenged

Increasing run cost of legacy platform

IT’s priorities are to modernize in order to **reduce run costs and simplify legacy**…

…while the business is demanding **agile, IT-driven transformation** to meet customer needs and competitive threats

Future State

Drive growth…

…by building a digital organization…

…on a transformed, modern digital platform

Source: CGI Global 1000

7 Barriers towards supply chain collaboration

7. Change Management approach

6. Governance

5. Interoperability: Semantic/technical Standards

4. Integration-architecture

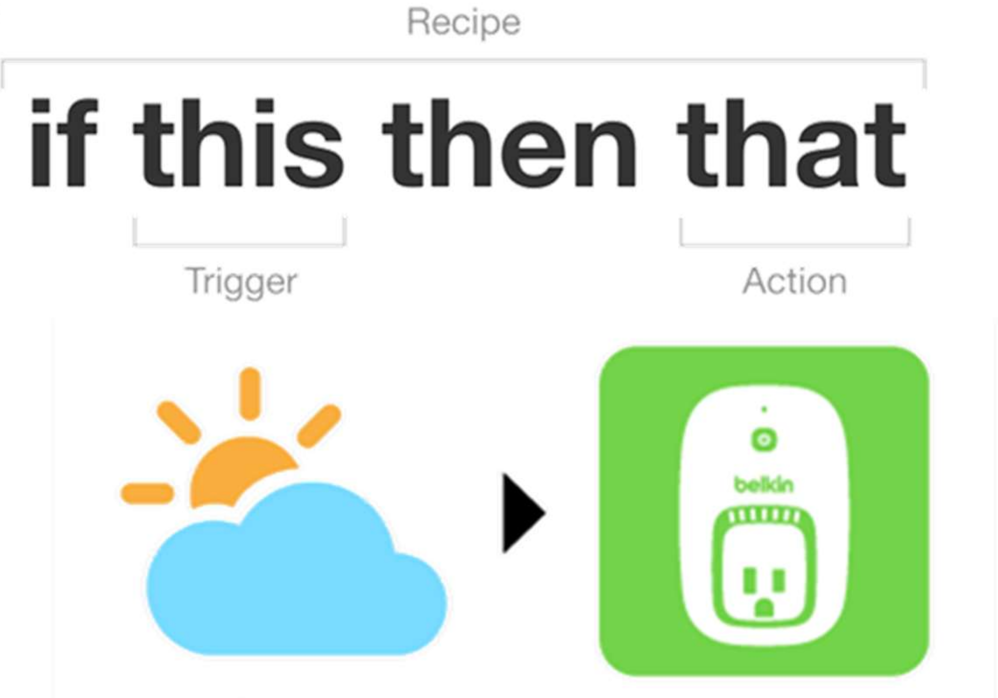
3. Sustainable Business Case

2. Conflicting/ Shared goals

1. Process/information

API’s & Internet-of-Things combined

Turn on your lights for dummies

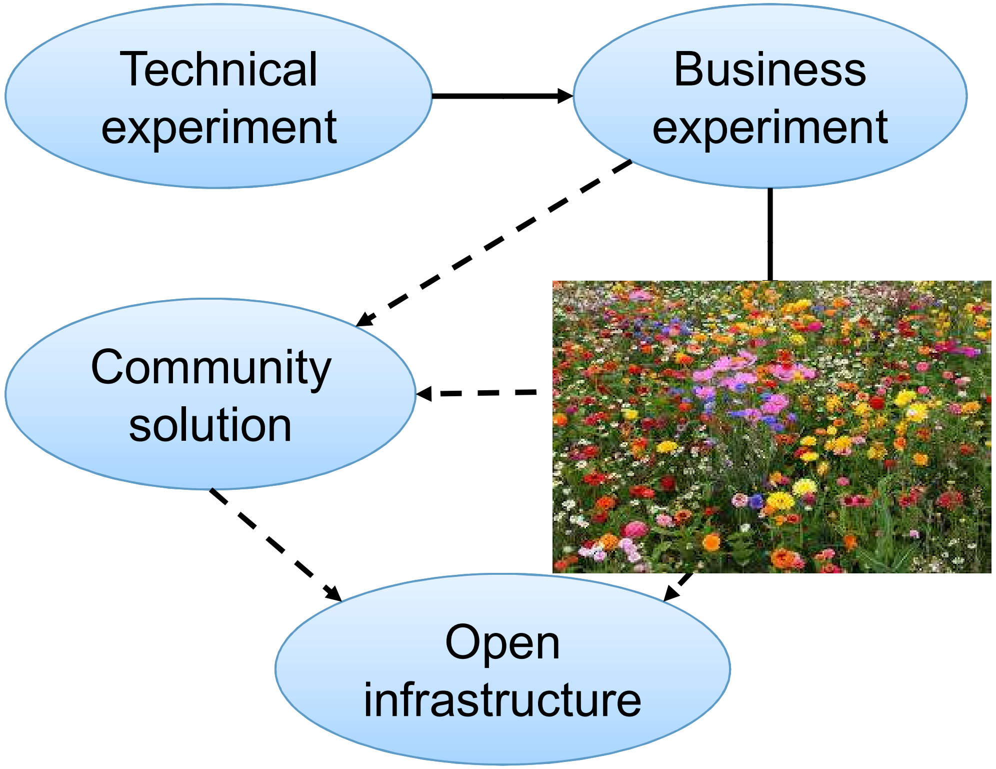

Recipe

if this then that

Trigger

Action

DO WE LET 1000 FLOWERS BLOSSOM ....



Semantic differences.
Differences in functionality.

Legacy of the future!

INTERNATIONAL DATA SPACES

INTERNATIONAL DATA SPACES ASSOCIATION

INTERNATIONAL DATA SPACES ASSOCIATION

THE IDSA DEFINES…

1 *Reference Architecture*

2 *Interfaces*

3 *Contractual Framework*

4 *Sample Code*

…FOR AN OPEN DATA-ECOSYSTEM.

www.internationaldataspaces.org

IDS – THE VISION

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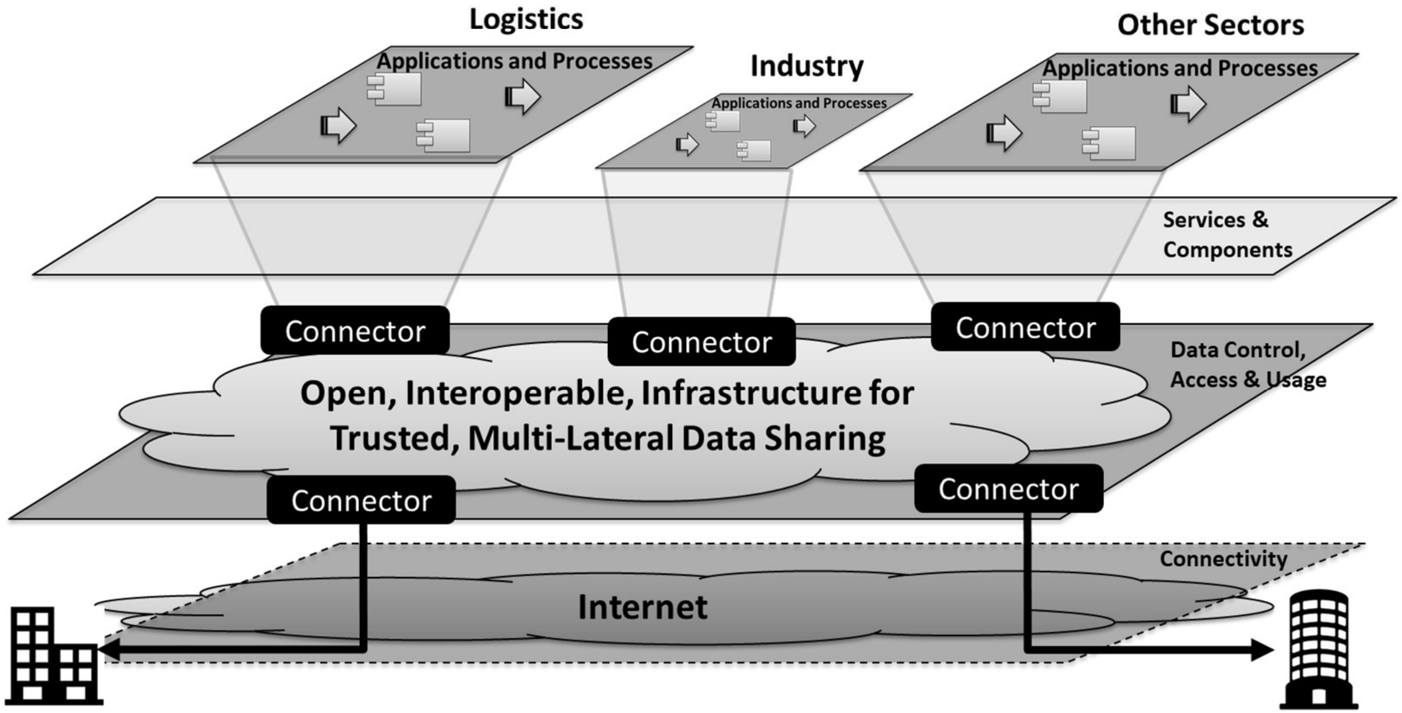
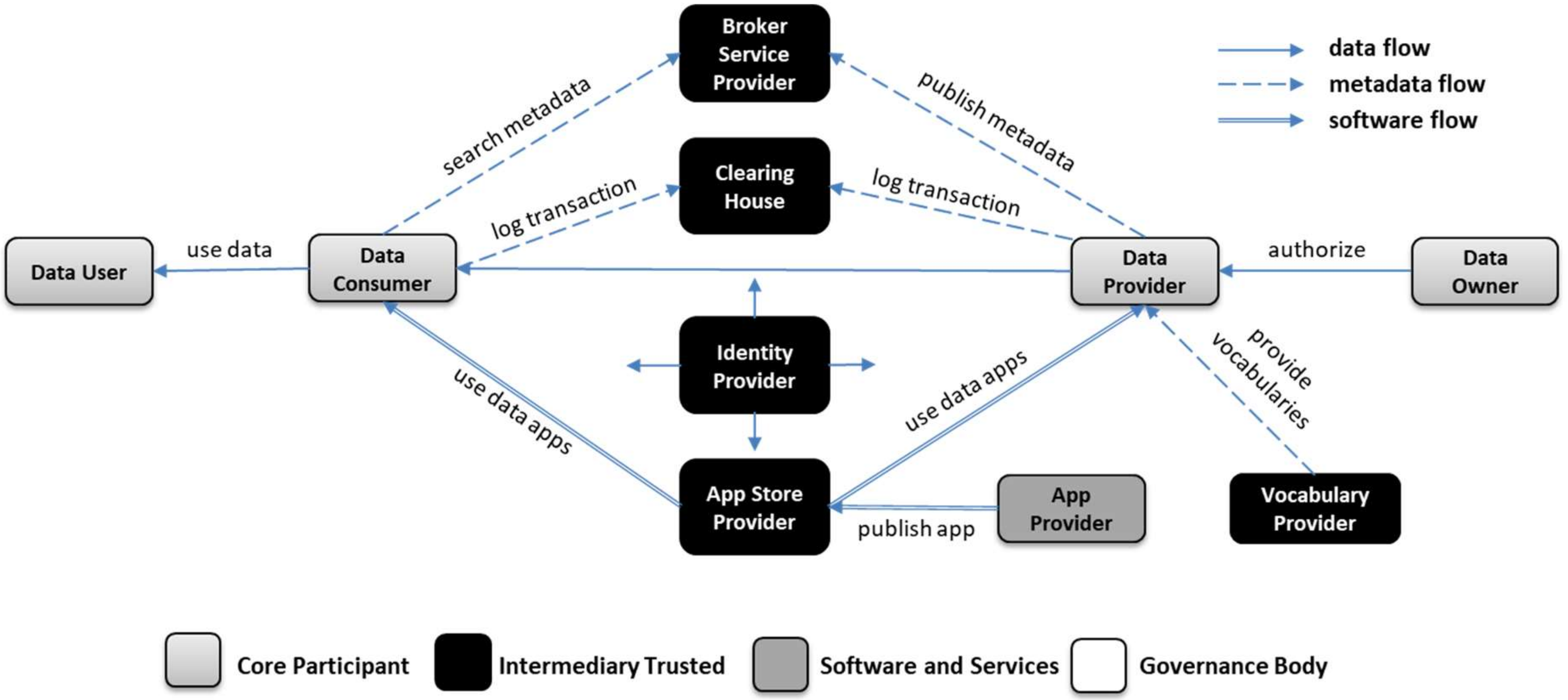
Infrastructure connecting organizations across sectors for multi-lateral, trusted, data sharing.

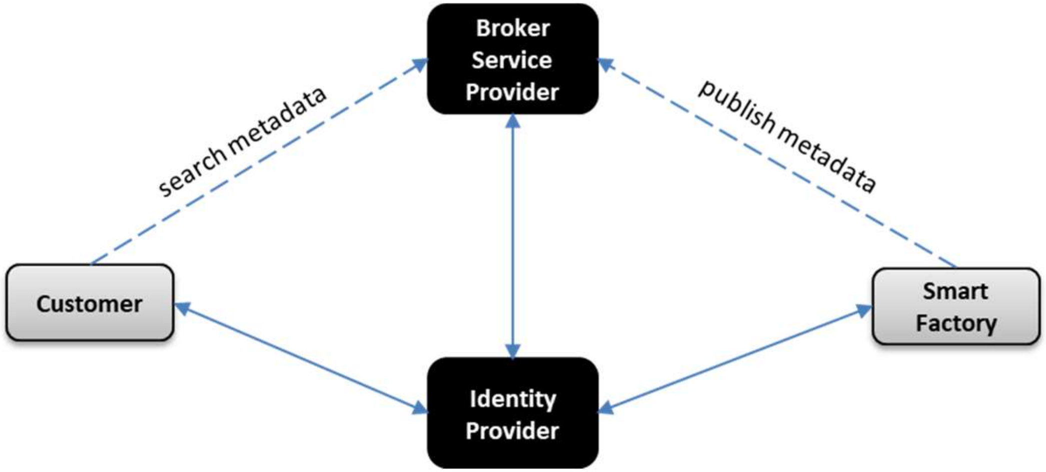

Logistics
Applications and Processes
Industry
Applications and Processes
Other Sectors
Applications and Processes
Services & Components
Connector
Connector
Connector
Data Control, Access & Usage
Open, Interoperable, Infrastructure for Trusted, Multi-Lateral Data Sharing
Connector
Connector
Connectivity
Internet

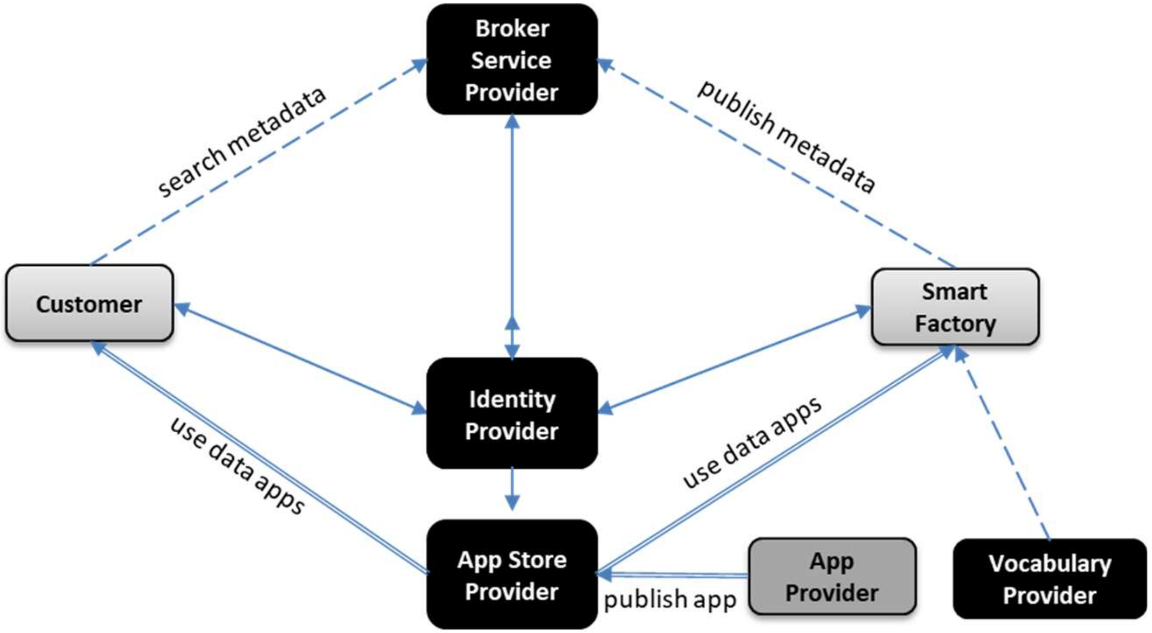
IDS: ROLE MODEL

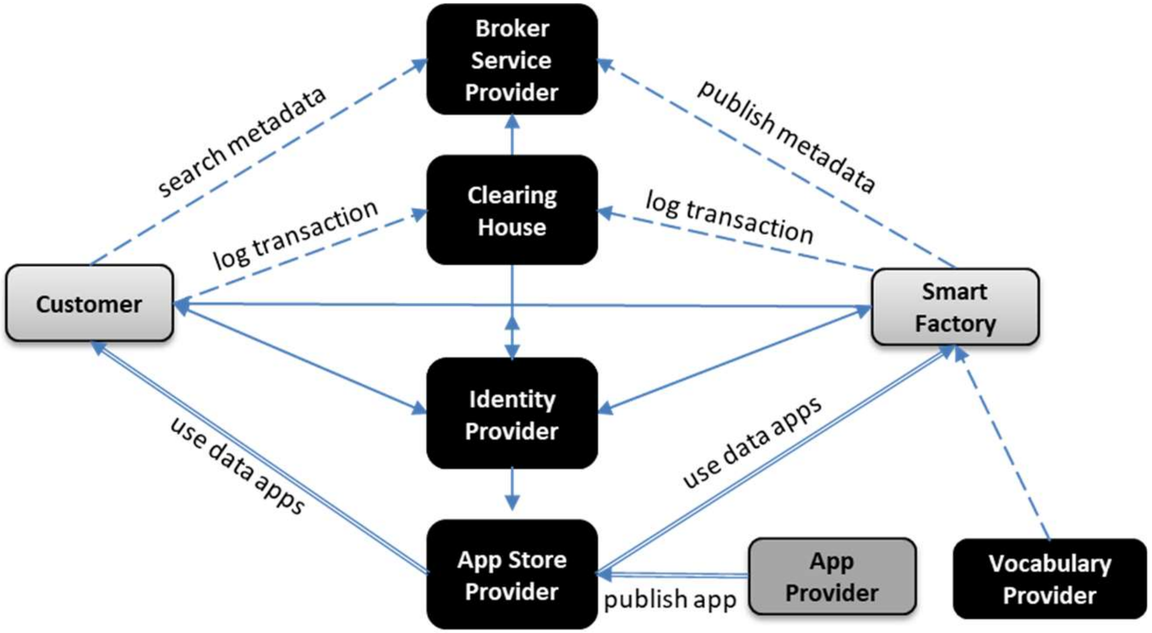
Ecosystem, open for stakeholders to participate

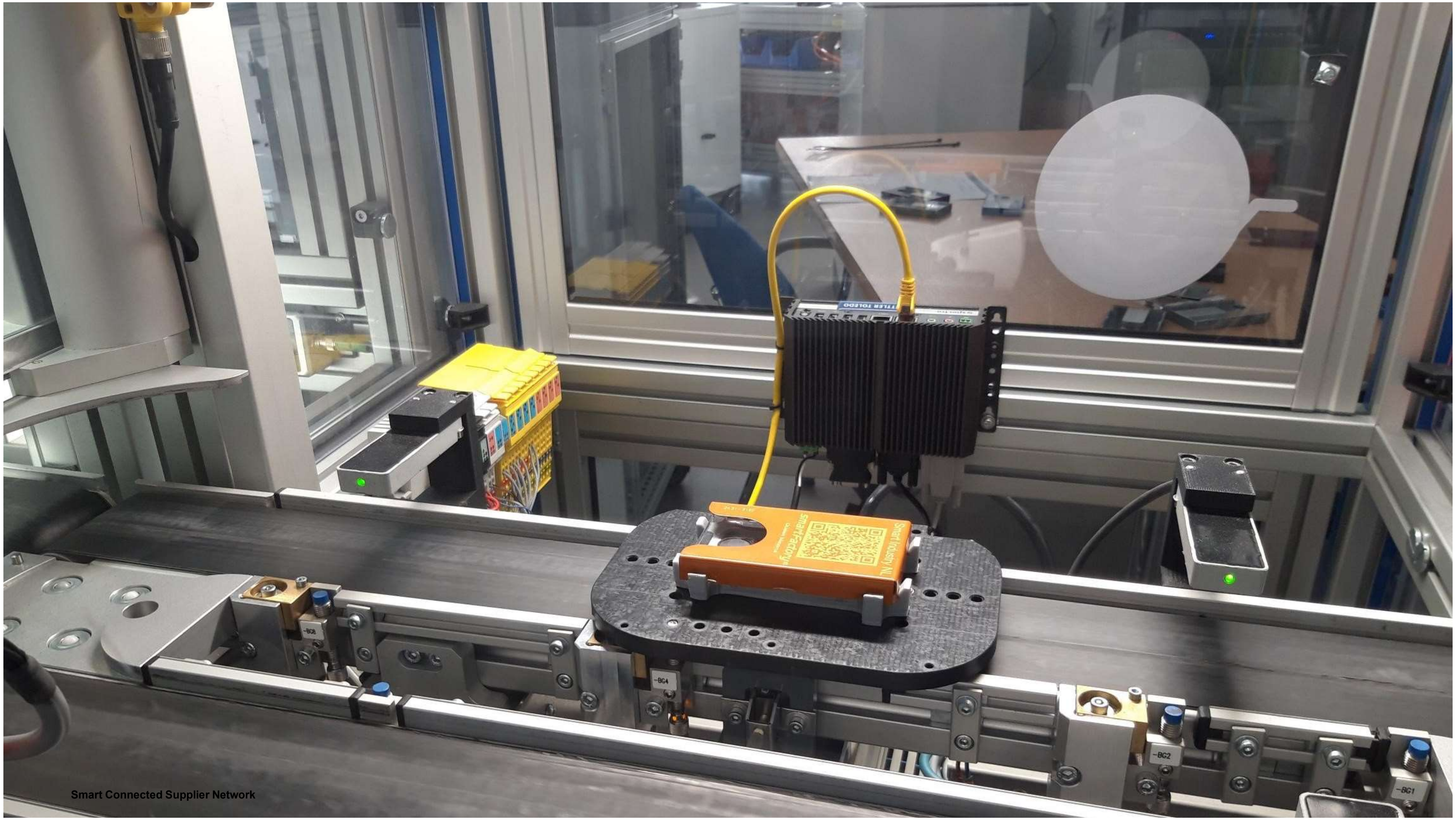


Cardbox factory


Broker Service Provider
search metadata
publish metadata
Customer
Smart Factory
Identity Provider


Broker Service Provider
search metadata
publish metadata
Customer
Smart Factory
Identity Provider
use data apps
use data apps
App Store Provider
publish app
App Provider
Vocabulary Provider


Broker Service Provider
Clearing House
Identity Provider
App Store Provider
Customer
Smart Factory
App Provider
Vocabulary Provider
search metadata
publish metadata
log transaction
log transaction
use data apps
use data apps
publish app


Smart Industry NL
smartFactory
TLER TOLEDO
-BG8
-BG4
-BG2
-BG1

DATA SHARING IN PRACTICE

- Creating trust
  - Identity provisioning
  - Data sovereignty (due to the data sharing agreements)

- Interoperability (Make use of multiple standards)
  - Smart Connected Supplier Network – Ordering
  - OPC Unified Architecture (OPC UA) is a machine to machine communication protocol for industrial automation
  - Open Trip Model – Logistic standard regarding shipments, trips, planning

- Security
  - All the information is encrypted and stored in an IDS container (connector)

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IDS - SECURITY VERSUS TRUST

Security

Non-functional design aspect:

The implementation of an IT-system must comply to its security level requirements as defined at system design and protect agains malicious or unintentional security breaches.

- Confidentiality, Integrity, Availability (CIA), …
- All ICT-systems must be secure

Trust Enablers

Functional design aspects:

- Data sovereignty
- Data sharing agreements
- Shared trust domain
- Enforcement of data sharing agreements
  - *legal enforceability*,
  - *implementation enforceability*
- Transparency
- System integrity monitoring

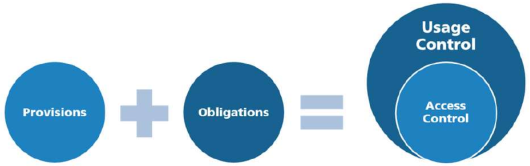
THE DL4LD PROJECT

Data Sovereignty is Key

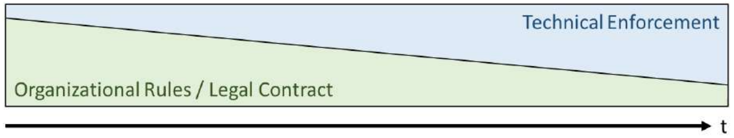
Being in control over your own data

- Who is allowed access to your data, for which purpose and under which conditions

Realization of data sovereignty requires a variety of enablers, i.e.:



- Technical enablers, e.g.:
  - Mechanisms for access control and for usage control
  - Enforcement of existing law, regulations, and (business) policies.
  - Security mechanisms: peer-to-peer data sharing, encryption, PKI / Key Management, …
- Procedural enablers, e.g.:
  - Making a data sharing agreement
  - Doing data sharing transactions: clearing, settlement, ..
  - Logging, data provenance and reporting



SO WHAT IS NEW?

- Individual (technical) aspects have been shown before
- So, why should it work (this time):
  - Governance, governance and governance….

Governance of development

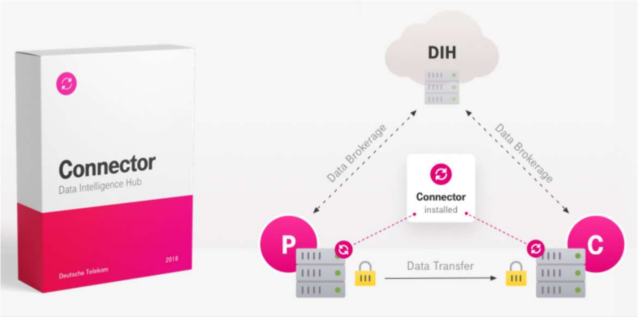
- *Design for an ecosystem:*
  - Open to users
  - Open to service providers and to innovation
  - Open to solution providers
- *Interoperability for scale, scope and reach:*
  - Vertically – inter-organizational
  - Horizontally – cross organization/sectors
  - Longitudinally– supply chain
- *Low barriers to participate*
  - Open source availability
- *Open standard design and maintenance process*

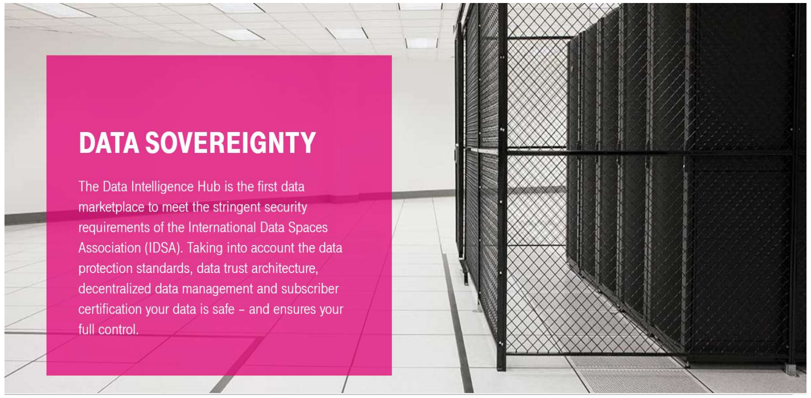
Governance of deployment

- *Provide adequate alternative for closed communities*
- *Create initial solution with sufficient scale*
- *Specific roles to be fulfilled by*
  - Telecommunication operators / service providers
  - Early adopters: major companies, field labs
  - Authorities

IDS: FOR ILLUSTRATION

- Deutsche Telekom has announced IDS-based commercial services / products
  - Based on IDS versions in development
    - Connector, Data Broker, Identity Provider
  - Data Intelligence Hub





DATA SOVEREIGNTY

The Data Intelligence Hub is the first data marketplace to meet the stringent security requirements of the International Data Spaces Association (IDSA). Taking into account the data protection standards, data trust architecture, decentralized data management and subscriber certification your data is safe – and ensures your full control.

- Data Sovereignty based on IDS
  - For policy definition and signalling
  - Extend and enforce into the DT domain, i.e.
    - The DT data lakes for AI
    - The DT AI workbench/tools

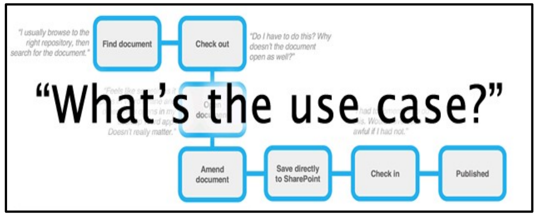
TNO OBJECTIVES

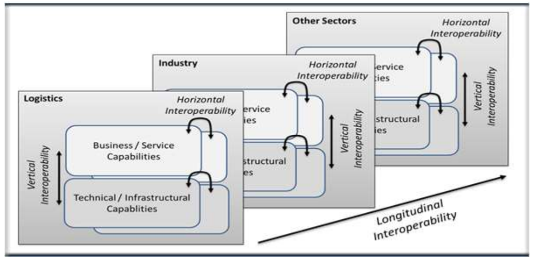
- Demonstrating viability through representative use case
  - Initial focus on: connector, identity provider, clearing house
  - Smart industry, logistics, cross-sector, cross-border,…

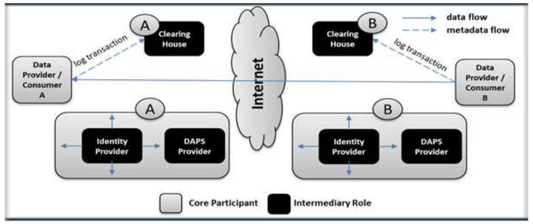
- Interoperability for scale, scope and reach:
  - Vertically – inter-organizational
  - Horizontally – cross organization/sectors
  - Longitudinally– supply chain

- Elaborating the IDS Service Model
  - Cross-sectoral
  - In an open, distributed, infrastructure for multi-lateral data sharing

- Providing open source IDS components
  - Connectors: Base, Trusted, Trusted+
  - Supporting solutions for: identity provider, clearing house, …


"I usually browse to the right repository, then search for the document."
Find document
Check out
"Do I have to do this? Why doesn't the document open as well?"
"What's the use case?"
Doesn't really matter."
awful if I had not."
Amend document
Save directly to SharePoint
Check in
Published


Other Sectors
Horizontal Interoperability
Industry
Horizontal Interoperability
Logistics
Horizontal Interoperability
Business / Service Capabilities
Technical / Infrastructural Capablities
Vertical Interoperability
Longitudinal Interoperability



SHORT HISTORY: THE DL4LD PROJECT

Data Logistics for Logistics Data (DL4LD) project

Data Logistics for Logistics Data (DL4LD) is an innovation project that aligns with the **ambitions of the 'Topsector Logistiek'** and **'Commit2Data**'.

The logistics companies will strive for an internationally leading position, amongst others as **chain orchestrator**, and will therefore have to **share logistics data on a large scale**.

To support this, a data **sharing infrastructure** is required as basis **for essential logistics information services**. The data sharing infrastructure must be **secure and trusted**.

NWO

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THANK YOU FOR YOUR ATTENTION

Take a look:
TIME.TNO.NL

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Simon Dalmolen, MSc

Tel: +31 6 30 71 31 07

Simon.Dalmolen@TNO.NL

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