

Implementing the EU Digital Product Passport with Digital Data Chain and Asset Administration Shell - Overview

VCI – Webinar on DPP Standardization
December 9th, 2024

Christoph Attila Kun (BASF)



Chempark Dormagen (Quelle: BAYER AG)

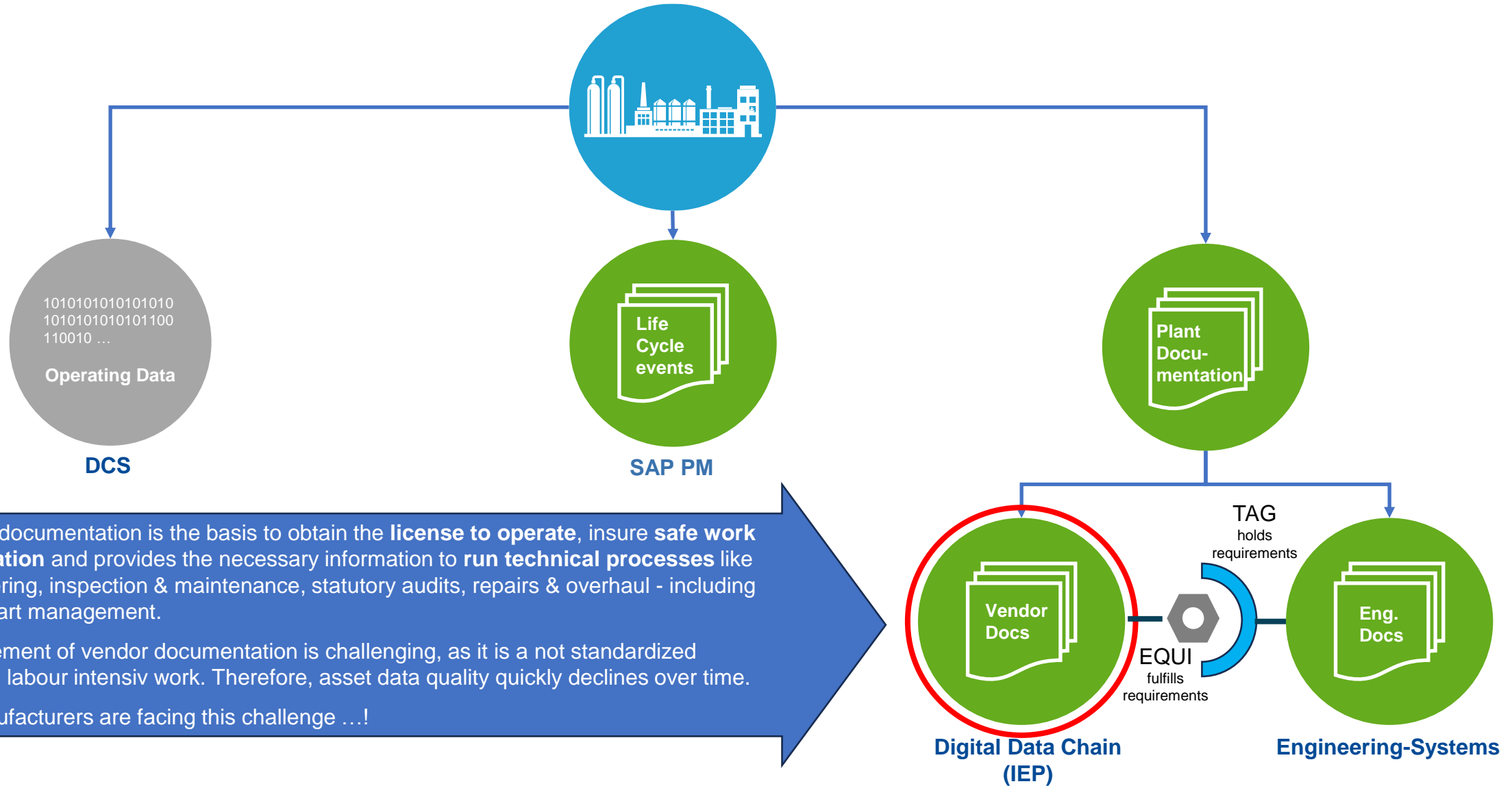


BASF Verbund Site Ludwigshafen (Quelle: BASF SE)

... is an asset intensiv industry.

DPPs / Digital Twins for production assets will play a significant roll in operating our plants!

Motivation: information management in plant operations



The Digital Data Chain Consortium



The Digital Data Chain Consortium was founded to automate the information provisioning from manufacturer to owner/operator by:

- developing the necessary technologies,
- achieve international standardization at ISO/IEC, as *must* for global acceptance by operators, suppliers and engineering contractors,
- have the critical mass to create the momentum for growth of the digital ecosystem.

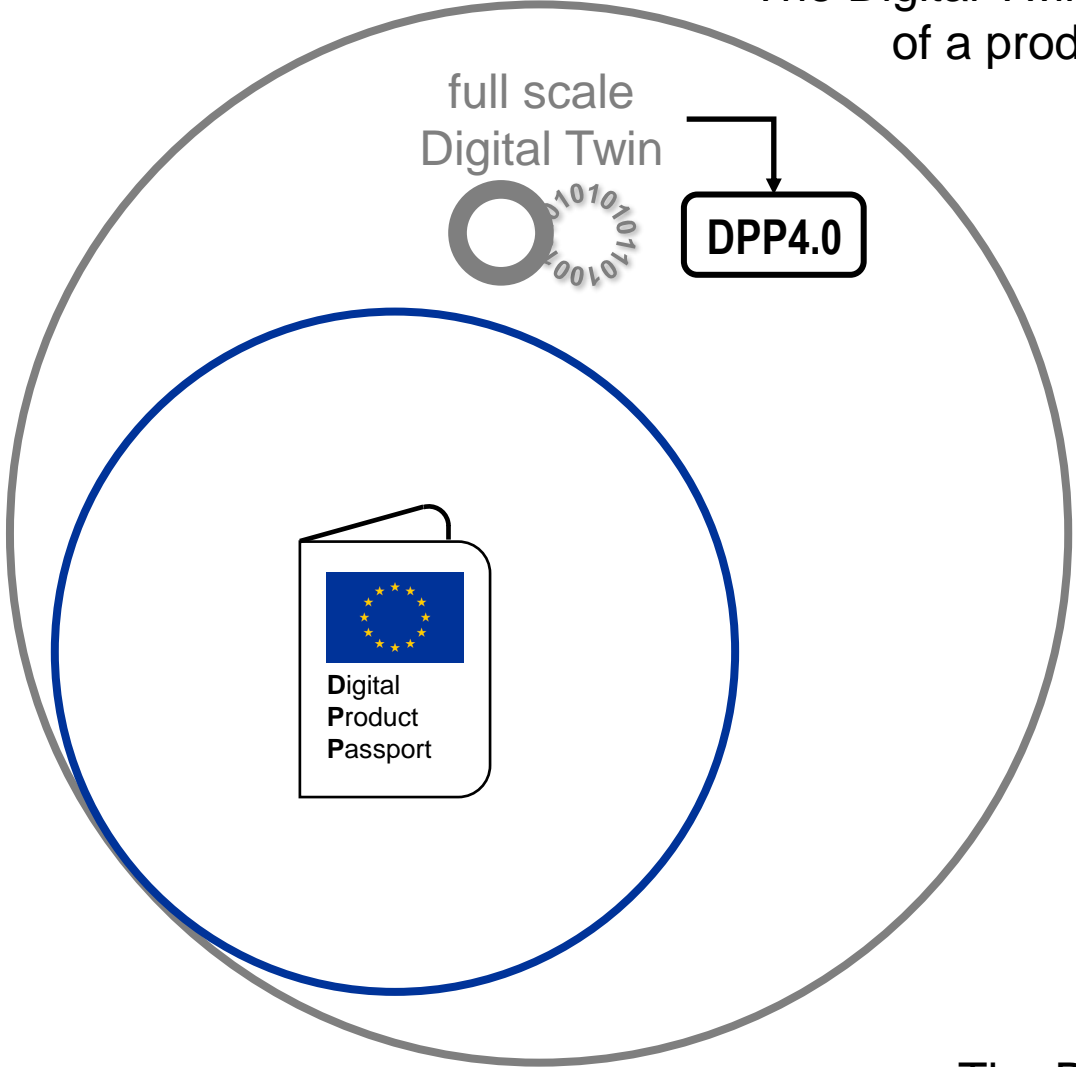


* BASF is the elected Consortium Leader of the Digital Data Chain Consortium (DDCC)
→ www.digitaldatachain.com

Digital Product Passport or Digital Twin?

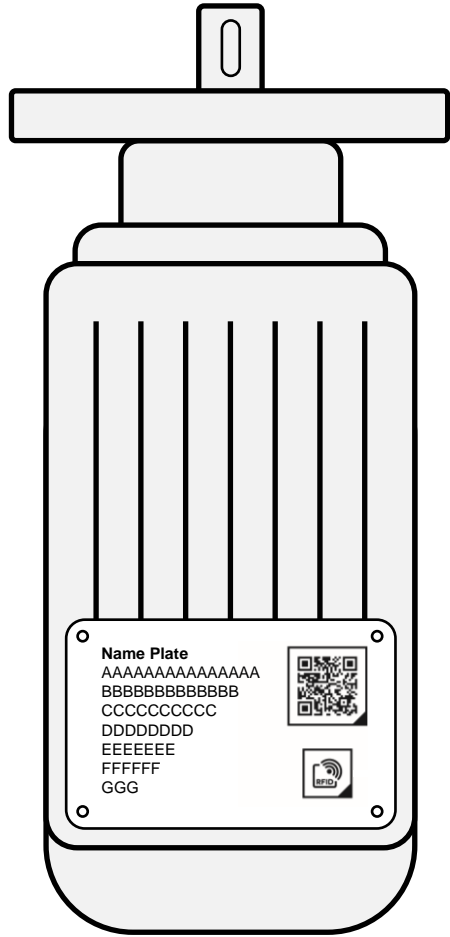


The Digital Twin is the collection of all information of a product including the ones of the DPP.

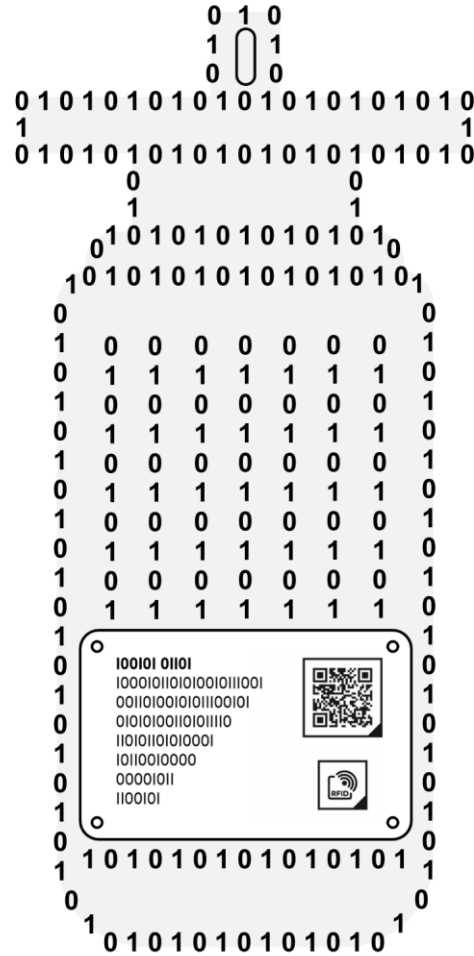


The DPP is the collection of all product information relevant for circularity and authorities.

Simplified data model of a Digital Twin



physical object



digital twin

digital representation of the physical object

functional model

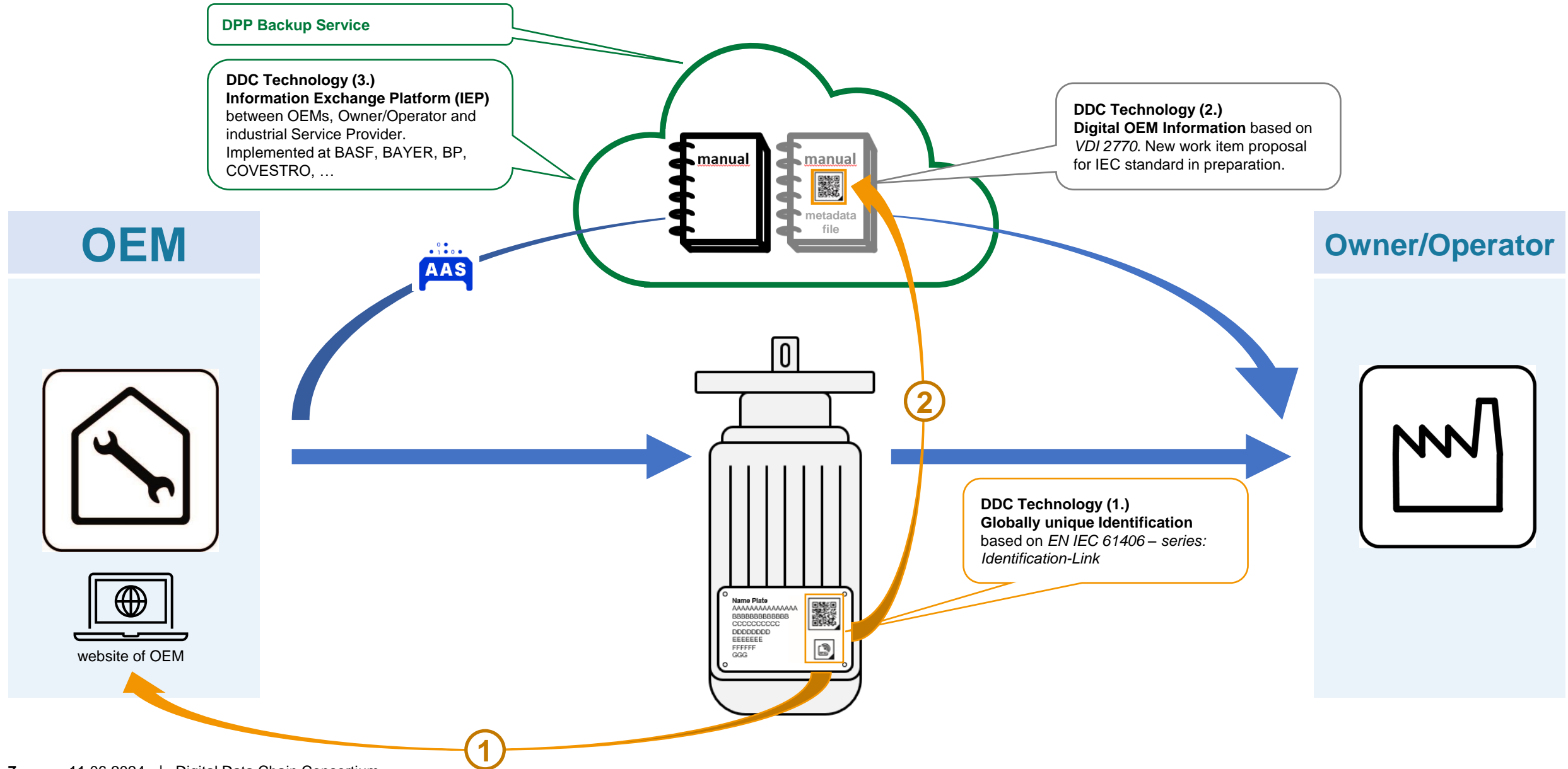
- simulation
- prediction
- condition monitoring
- ...

information model

- tech specs
- documentation
- life cycle information
- ...

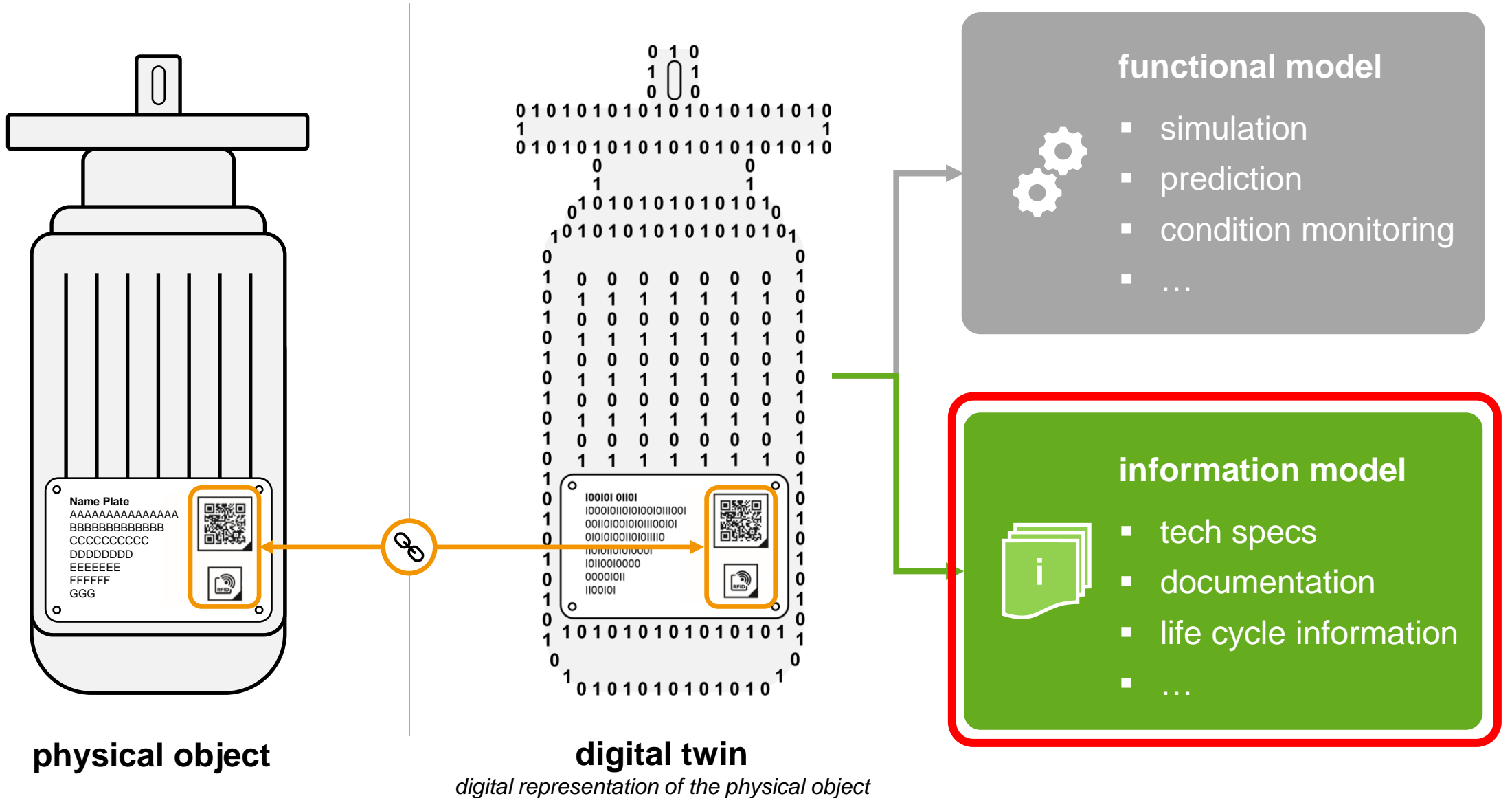


The DIGITAL DATA CHAIN → Combining the technologies

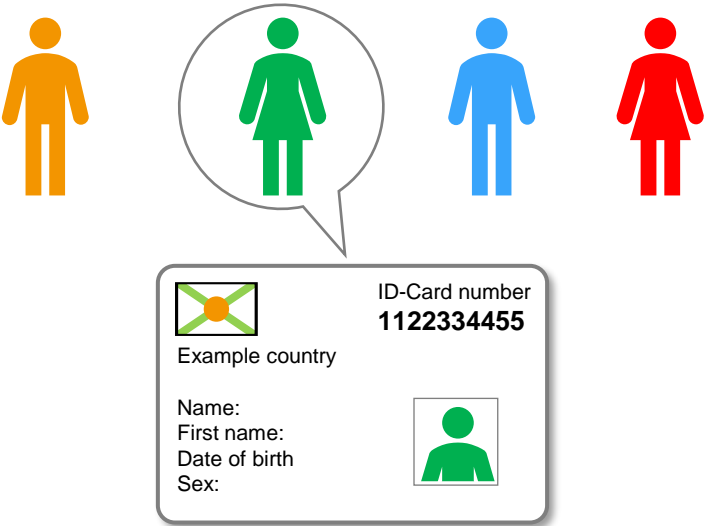




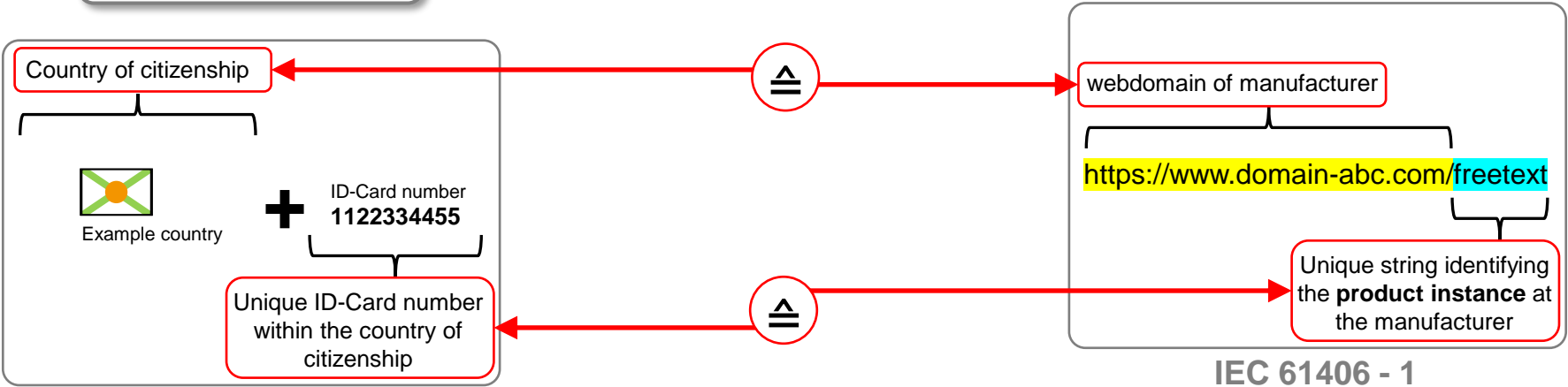
EN IEC 61406 – Identification Link → connecting the physical product to its Digital Twin



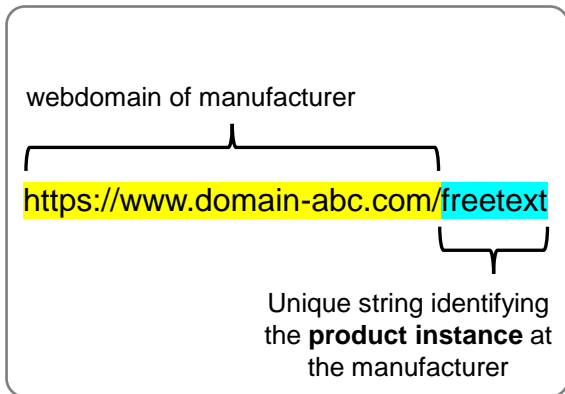
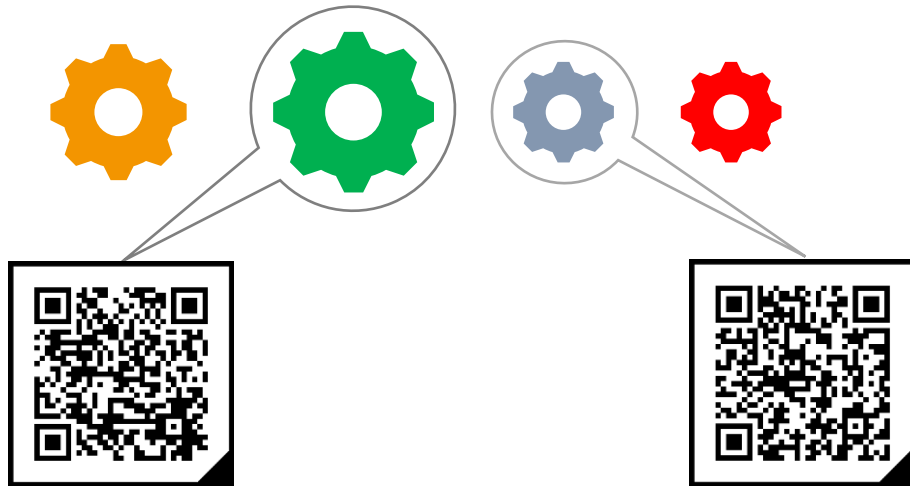
Identification of an individual



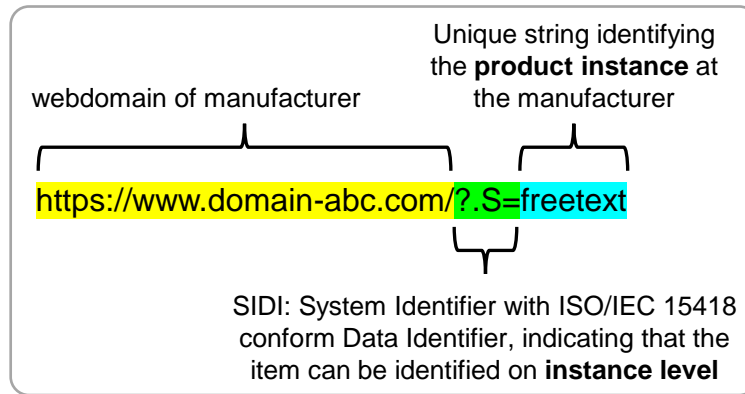
Identification of an individual



Identification of an individuum

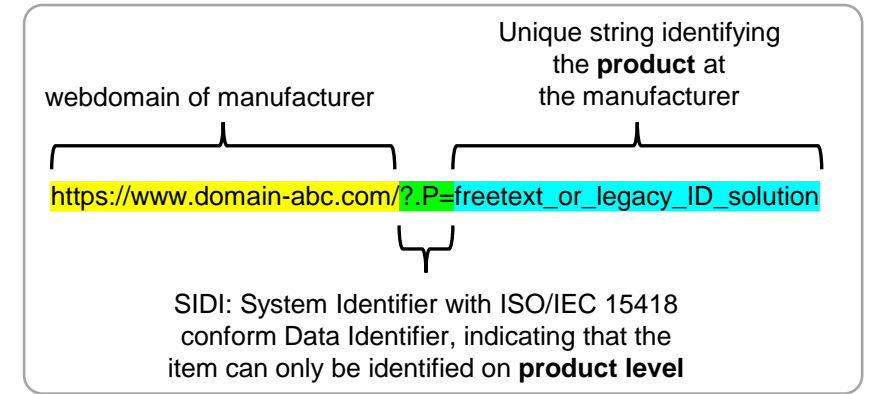
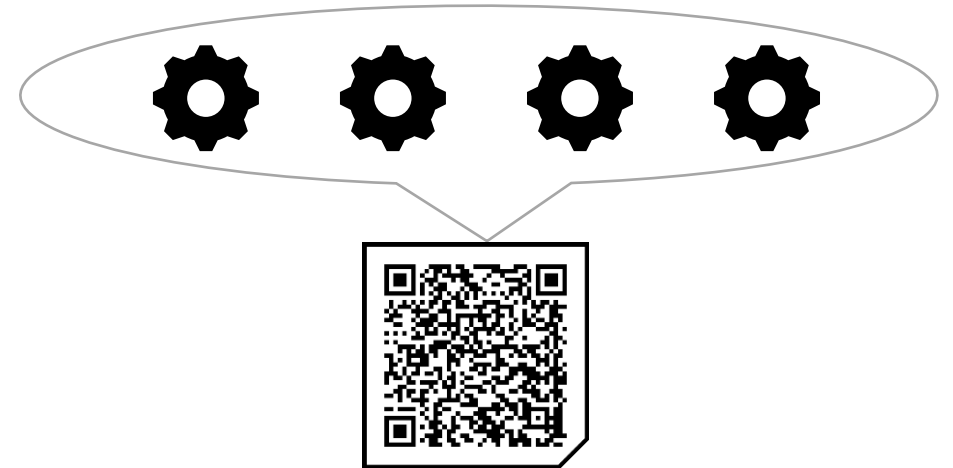


IEC 61406 - 1



IEC 61406 - 2






Identification of an identic group



IEC 61406 - 2

Starting point: multiple legacy ID systems and various requirements

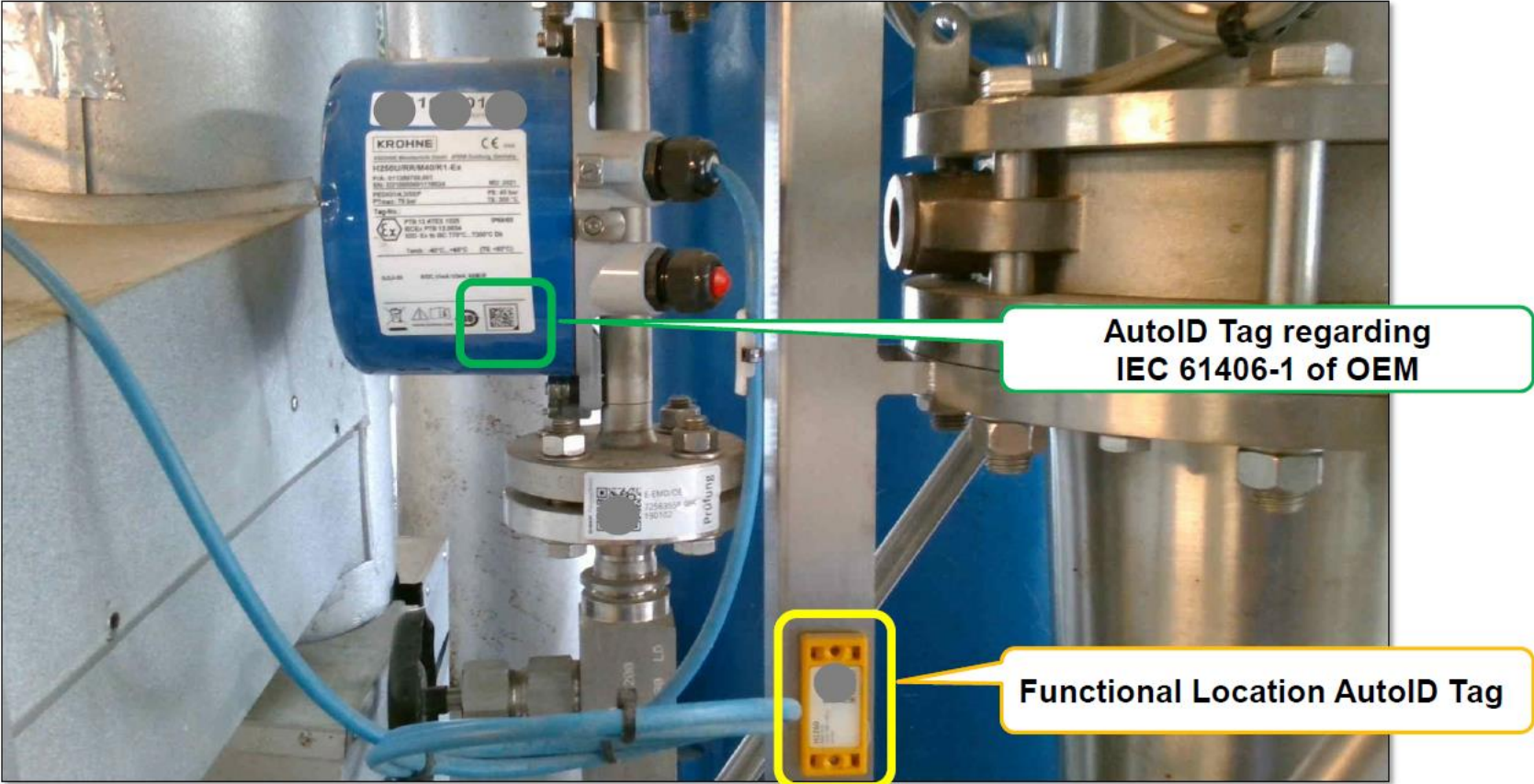


Company name	Company web-domain*	Company type	Industry / branch	Legacy ID system in use	IDs	Interoperable, globally unique object / product identifier created according EN IEC 61406- series – Identification Link	2D-Code / RFID
AAA Steel	aaa-steel.com	medium enterprise	raw materials & commodities	Internationally standardized material name as product code + batch number	H320B 24-04-15-1	aaa-steel.com/?1P=H320B&1T=24-04-15-1	
BBB parts	bbb-parts.de	small enterprise	special turned & milled parts	Purchase order number of custom item	PO-240307-232	bbb-parts.de/PO240307-232	
CC Company	cc-comp.eu	large company	factory outfitter	Product code + serial number	Coriolis-maX Cm96-232	cc-comp.eu/?1P=Coriolis-maX&S=Cm96-232	
DD Company	dd-comp.eu	major corporation	automotive parts	DUNS number + product code + serial number	123456789 BR55 242131-F	dd-comp.eu/?18V=UN123456789&1P=BR55&S=242131-F	
EE Company	ee-comp.com	large company	consumer goods / food	Global trade item number (GTIN)	9520123456788	ee-comp.com/?8P=9520123456788	

The EN IEC 61406-series Identification Link is the internationally standardized interoperability solution for globally unique object / product identification.

And it is truly low or no cost, as you can use your existing legacy ID system and just combine it with your company web-domain!

Implementation of IEC 61406 ID-Link in the plant



What is Product Identification now?

3 in 1

1) It is a string < 100 characters

2) It is an unique identifier made for asset management (any equipment)

3) It is an URI, leading to ABB



<https://id.abb/9AAC129110?SN=3K650000554982>

Do You see the trick? The same QR code can be used in multiple ways.

WARUM DPP4.0

wöhner

- Vereinfachung zukünftiger Prozesse
 - Zukunftsweisende Technologie um Vorgaben der EU besser händeln zu können
 - Normiert Plattform zum Datenaustausch (Verwaltungsschale) mit Kunden und Lieferanten
 - Weitere Geschäftsmodelle durch Zugangsberechtigungen möglich
 - Kosteneinsparung durch Wegfall der Papierdokumentation
- Simplification of future processes
 - Forward-looking technology to better handle EU requirements
 - Standardized platform for data exchange (administration shell) with customers and suppliers
 - Further business models possible through access authorisations
 - Cost savings due to elimination of paper documentation



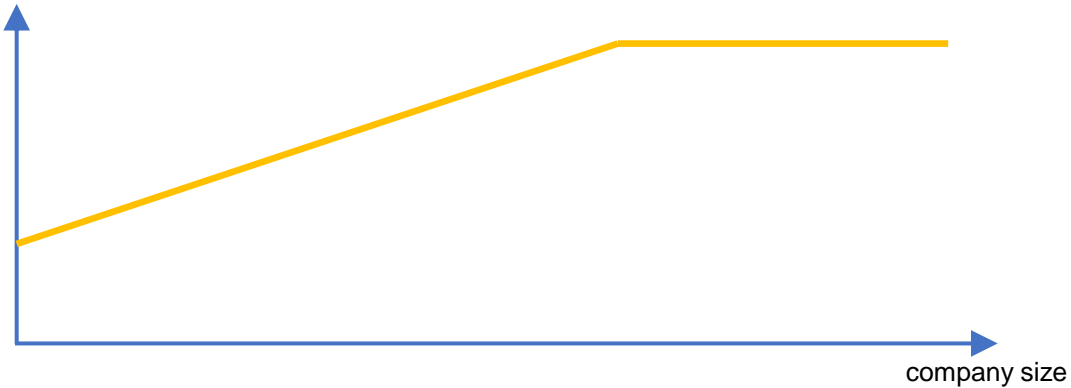


Comparison of costs of potential unique product identifiers for the EU DPP

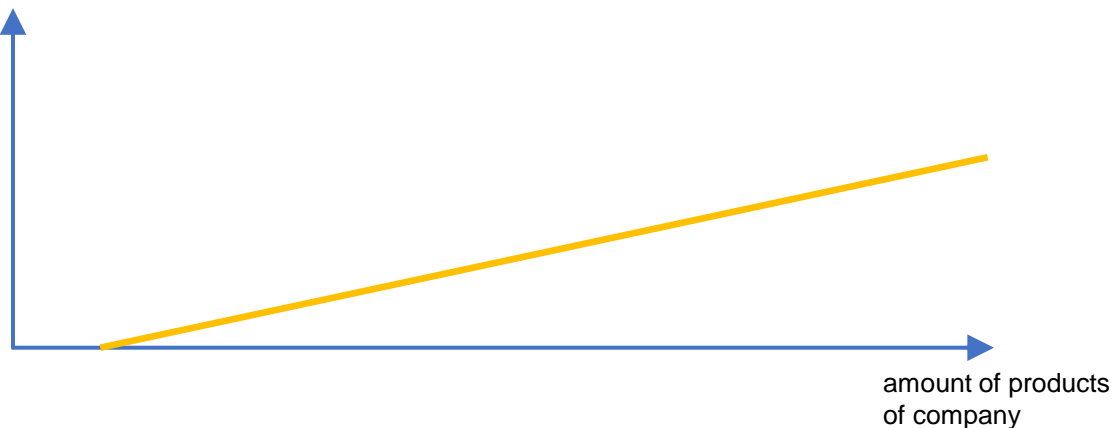
ISO/IEC 15459 based identifier

exemplary license model of issuing agencies, mainly used in retail business

basic license fee



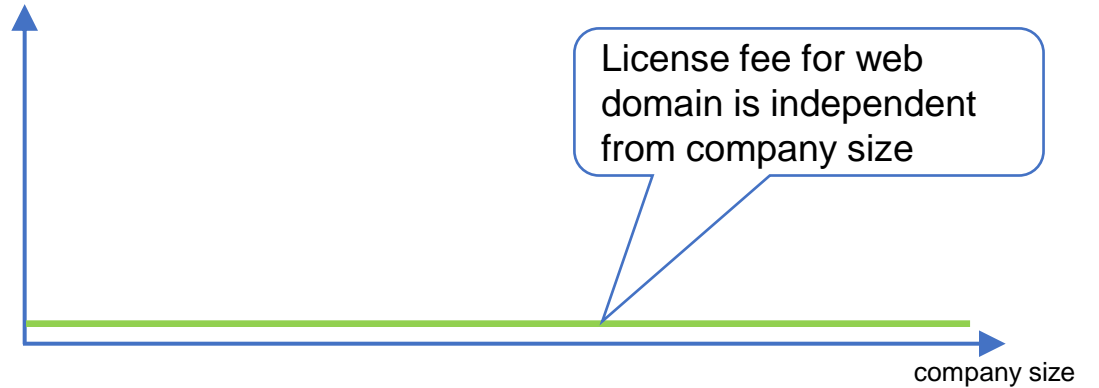
product related license fee



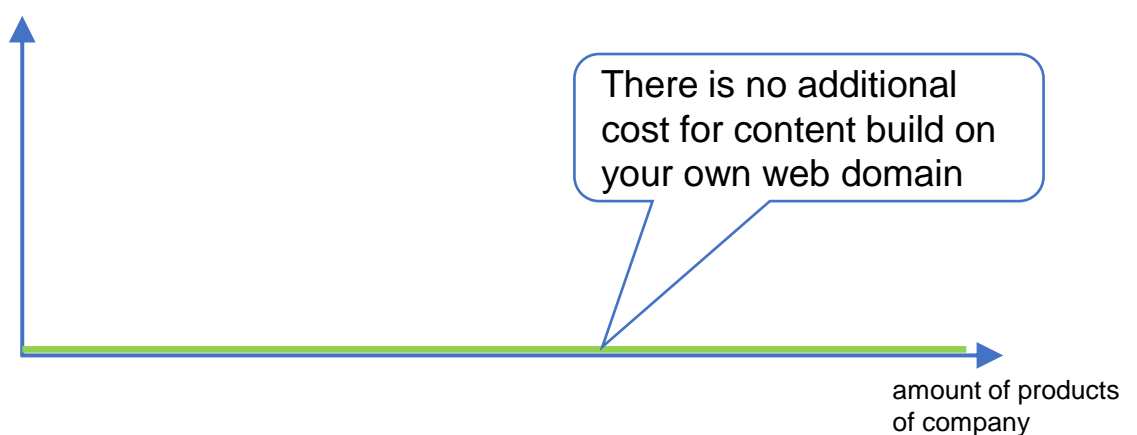
EN IEC 61406 based identifier

mainly used in industry / b2b

basic license fee



product related license fee

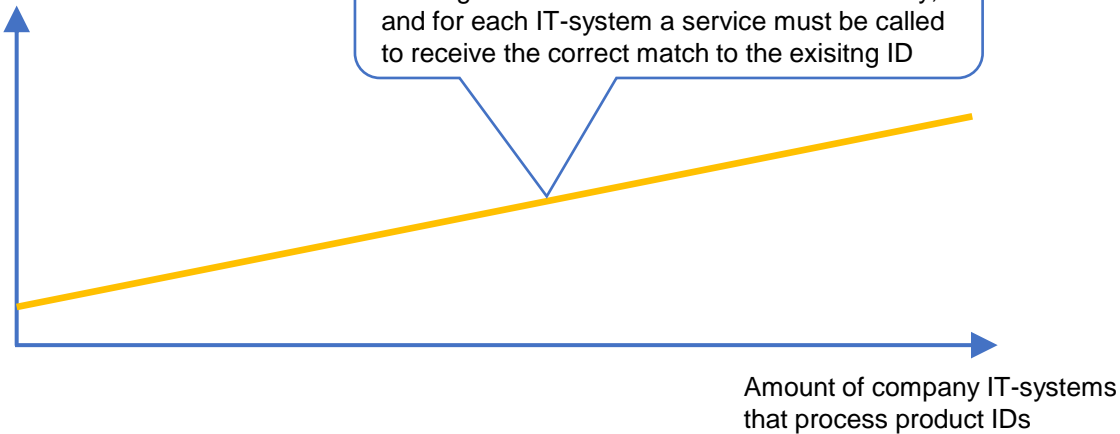




Comparison of costs of potential unique product identifiers for the EU DPP

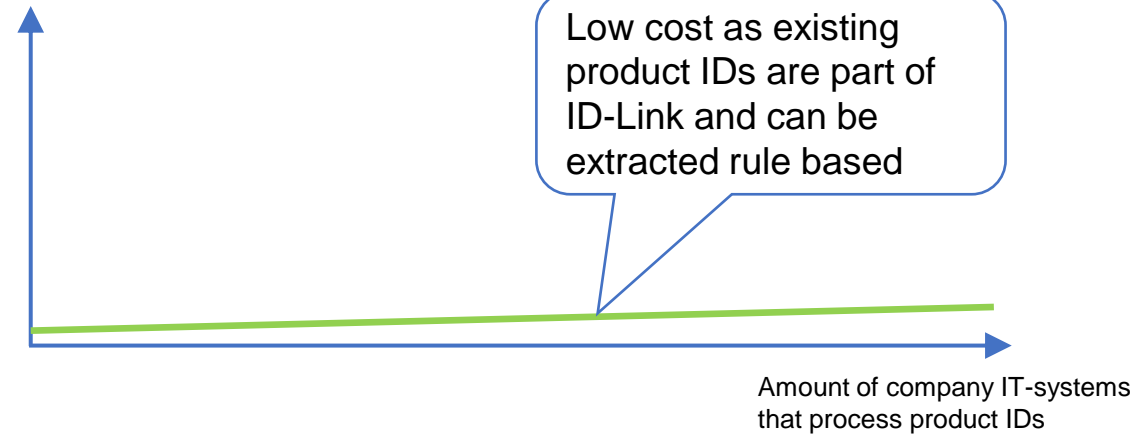
ISO/IEC 15459 based identifier

Integration cost with existing ID system, if it is not ISO/IEC 15459 based



EN IEC 61406 based identifier

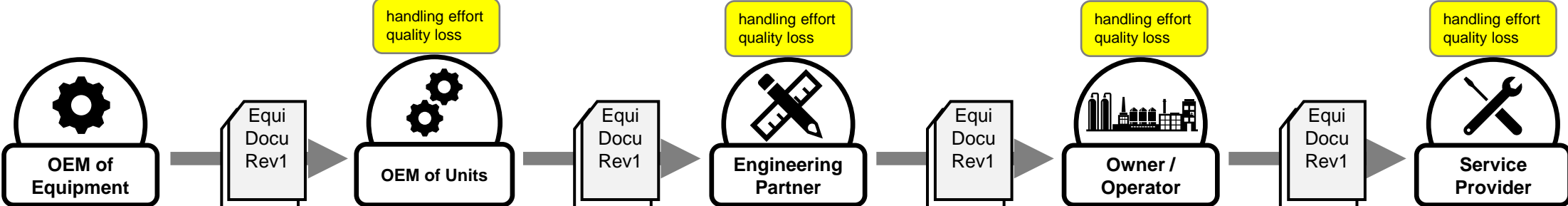
Integration cost with existing ID system, if it is not ISO/IEC 15459 based



The costs for the product identification accumulate in your supply chain. The longer your supply chain, the higher the costs! Therefore, it is so important to minimize costs right from the beginning by ensuring the freedom of choice between different technologies.

To avoid substantial ongoing costs for the industry, the participation in CEN/CENELEC standardization is necessary.

Digital Data Chain (DDC) technologies → the Information Exchange Platform (IEP)



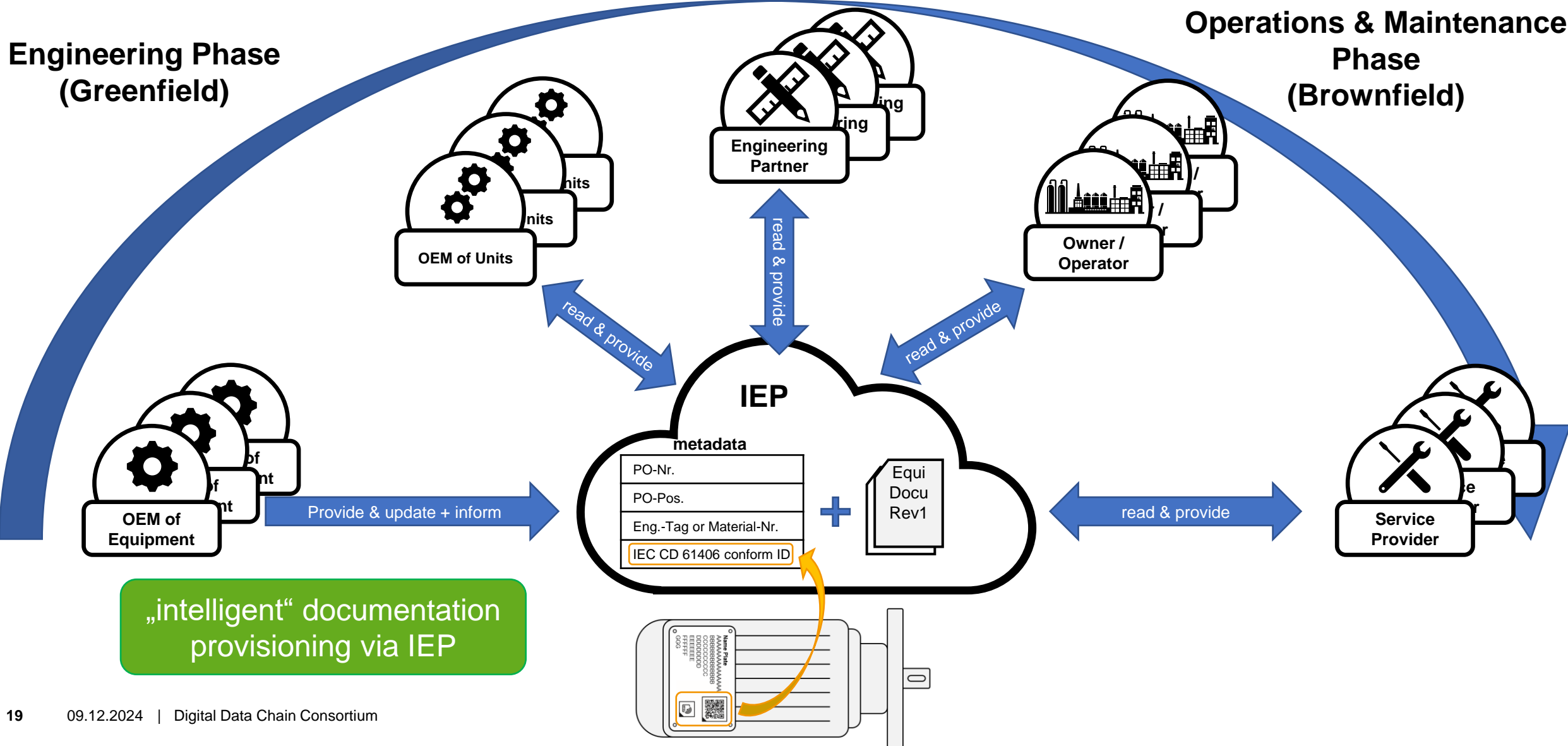
classical, „non intelligent“
documentation provisioning

Digital Data Chain (DDC) technologies → the Information Exchange Platform (IEP)

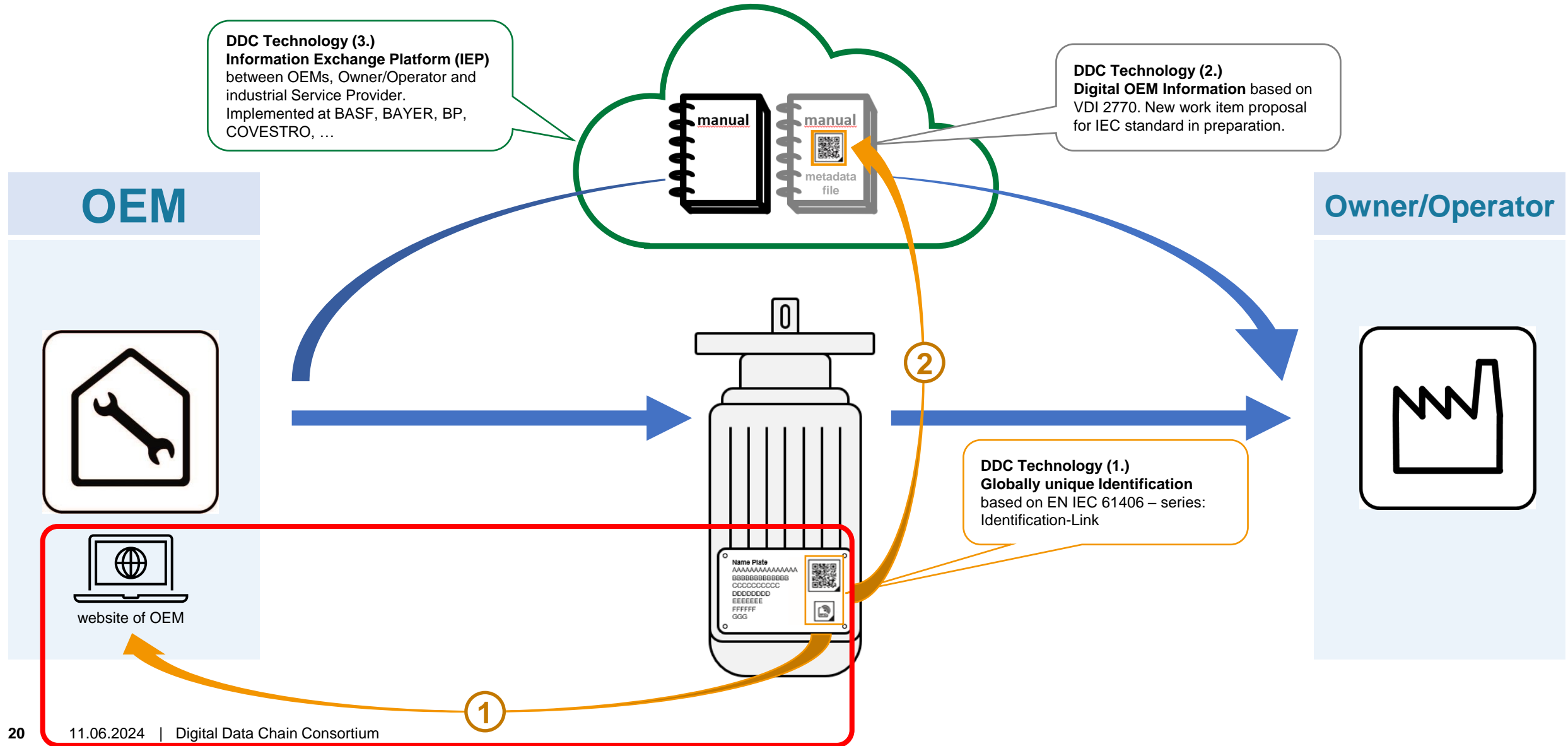
Lifecycle

Engineering Phase
(Greenfield)

Operations & Maintenance
Phase
(Brownfield)

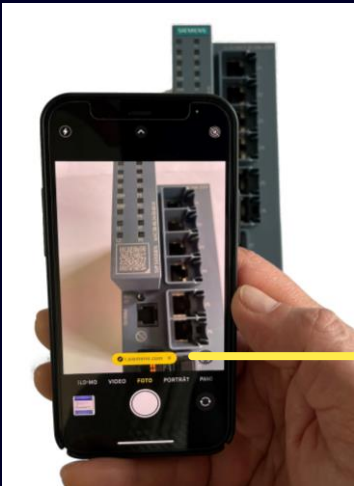


The DIGITAL DATA CHAIN → Combining the technologies



Live Demo: Example Siemens

Product




ID Link

 [i.siemens.com >](https://i.siemens.com)


Online Digital Nameplate

SIEMENS English













6GK5206-2BS00-2AC2
SCALANCE XC206-2SFP

SCALANCE XC206-2SFP manageable Layer 2 IE switch; IEC 62443-4-2 certified; 6x 10/100 Mbit/s RJ45 ports; 2x 100/1000 Mbit/s SFP; 1x console port; diagnostics LED; redundant power supply; temperature range -40 °C to +70 °C; assembly: DIN rail/S7 mounting rail/wall Office redundancy functions features (RSTP, VLAN,...); PROFINET IO device; Ethernet/IP-compliant; C-plug slot;

Lieferfreigabe 12/01/2016 


Digital nameplate

    [More certificates](#)

The test symbols depicted on the nameplate indicate the certificates and directives with which the product complies.

Support entries

- Manual/Operating instructions 21
- Technical data
-  Asset Administration Shell (AAS)**
- Certificate 39
- Download/Software 10
- Product note 22
- FAQ 25
- Application example 9
- Catalog/Brochure 2

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[Privacy Policy](#) [Cookie Policy](#) [Terms of use](#) Digital ID



View in Asset Administration Shell with AASX Package Explorer

AASX Package Explorer V3.0 - local file: C:\Users\adpsa\Siemens AG\DDC - Digital Data Chain - Documents\DDC - Management\025 Communication & Marketing\Events\HM_2024\AASen für die drei ausgewählten Produkte\SIEMENS_TYPE_XC206_6GK5206-2BS00-2AC2 (3)

Asset Administration Shell (AAS)

Digital Nameplate



This Digital Nameplate stands for a standardized Submodel of the Asset Administration Shell (AAS). It is based on IEC 61406 series for identification of the asset and IEC 63278 series for interoperable access of information. Submodel, AAS and IEC standards are, among others, also important building blocks of the Digital Product Passport (DPP4.0) initiatives.

This is version V2.0 of the Submodel for digital nameplate. It is maintained by the Industrial Digital Twin Association (IDTA). It currently features a mix of URI and ECLASS properties and is already prepared to be updated with IEC CDD properties.

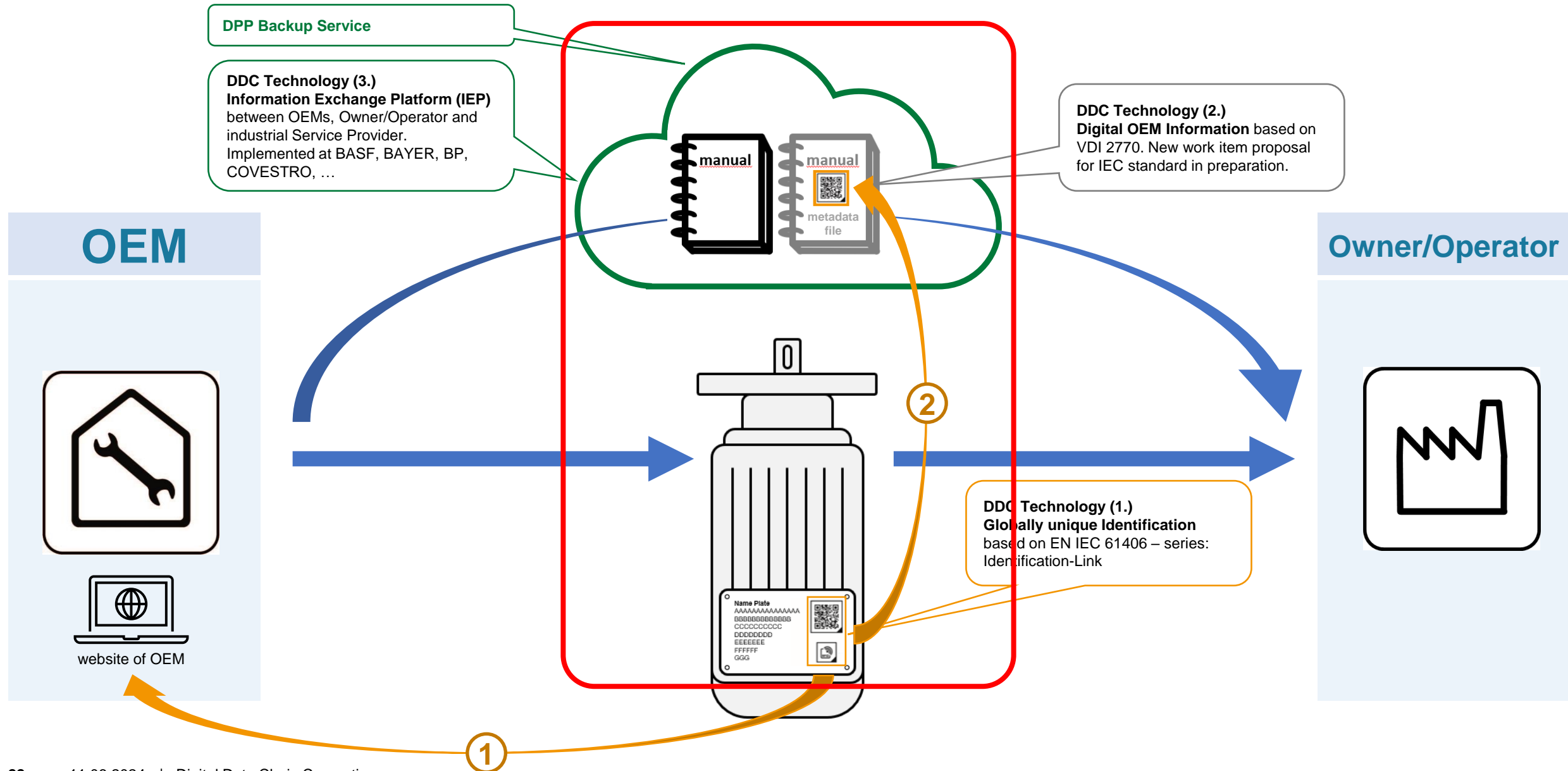
managed switch
AG
SIEMENS

(11) SCALANCE XC206-2SFP manageable Layer 2 IE Switch
(12) XC-200 managed switch
(13) managed switch Layer 2 IE Switch
(14) 6GK5206-2BS00-2AC2
(15) 6GK5206-2BS00-2AC2
(16) (not analyzed)

(17) SCALANCE XC206-2SFP manageable Layer 2 IE Switch
(18) Ostliche Rheinbrückenstraße 50 • Karlsruhe • DE
(19) (not analyzed)

The DIGITAL DATA CHAIN → Combining the technologies



Sharecat Information Exchange Platform

The screenshot displays the Sharecat Information Exchange Platform interface. The top navigation bar includes a search bar, a workspace selector set to "Demo Workspace", and a "Create/Add" button. The left sidebar shows a hierarchical tree view of the data structure, with "VPS2333225|Net..." selected under the "IN-04" folder.

The main content area shows the details for the selected object: "Equipment ID: VPS2333225" and "Equipment Type: Network switch". The "Brand" field is set to "Siemens". A "Record Status" badge indicates the object is "Reserved". A QR code is also visible.

Below the details, a navigation bar allows switching between different views: "PROPERTIES (13/14)", "ATTRIBUTES (0/94)", "DOCUMENTS (16)", "OTHER FILES (22)", "PICTURES (1)", "RELATIONSHIPS (1)", and "EXTERNAL".

The "Properties defined by Object Type: Equipment" section contains a table with the following data:

Properties	Value
Equipment ID	VPS2333225
Equipment Type	Network switch
Brand	Siemens
Approval status	Approved
Delivered by	Siemens
Product ID	6GK5206-2BS00-2AC2
Delivery date	2024-04-06
Production date	2024-02-01

Artificial Intelligence

Why do we need a DPP / Digital Twin when we have AI available?

The DPP / Digital Twin is the information source for the AI to provide reliable, comprehensive and trustworthy answers!

Because no AI is a clairvoyant 😊



Christoph Attila Kun

Global Product Manager *Digital Data Chain* @ BASF

Manager *Digital Data Chain Consortium GbR* → www.digitaldatachain.com

Factory-X Use Case lead: Collaborative Information Logistics

Chairman VDI Experts Council 2770

National delegate CEN/CENELEC JTC 24 – EU Digital Product Passport

Mobil : +49 1522 8866364

Mail: christoph-attila.kun@basf.com

Please don't hesitate to contact us, if you are interested in the Digital Data Chain (DDC) and its global implementation!



Digital Data Chain Consortium

www.digitaldatachain.com