



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

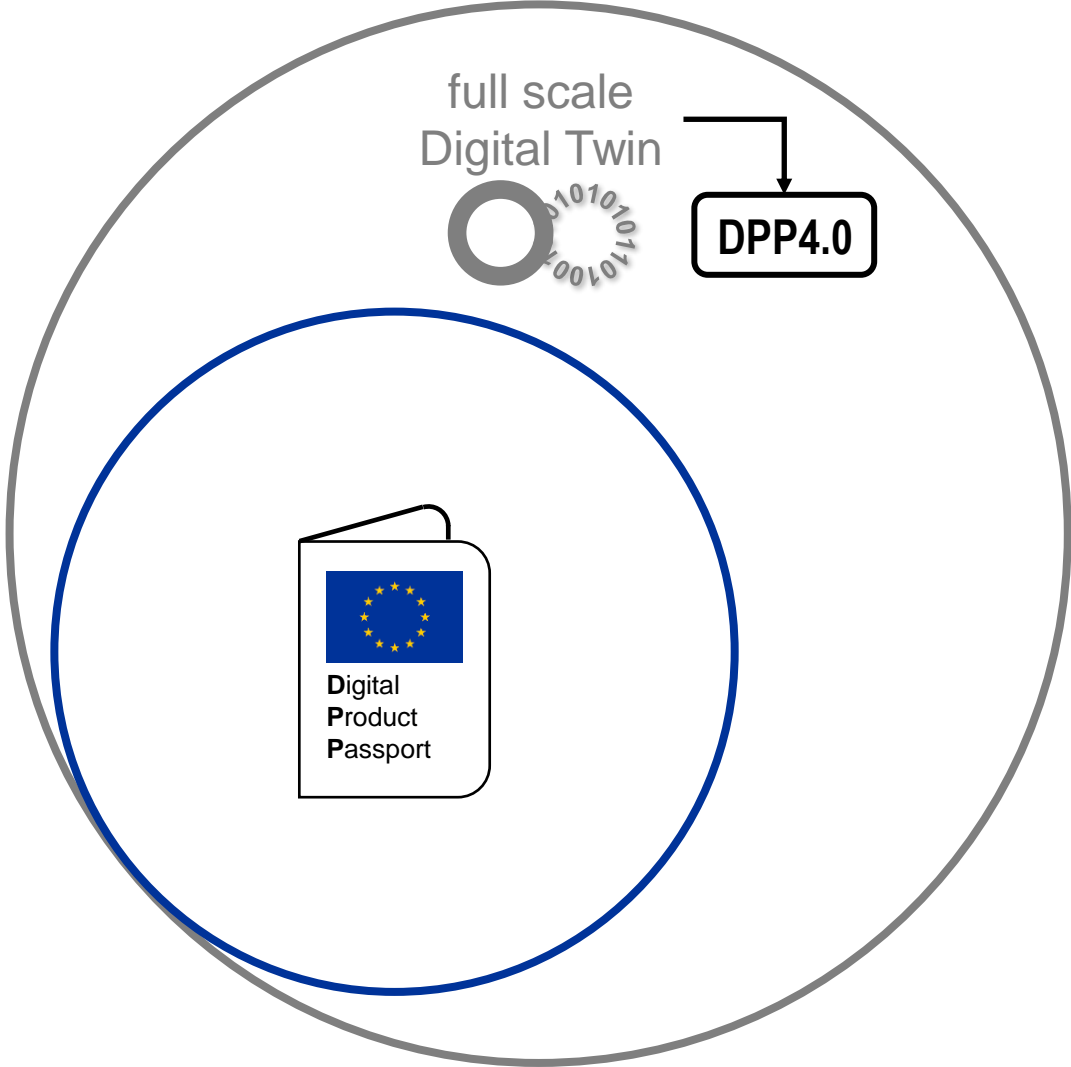
THTH webinar May 2024

Online Event

May 29th 2024

Christoph Attila Kun (BASF SE)

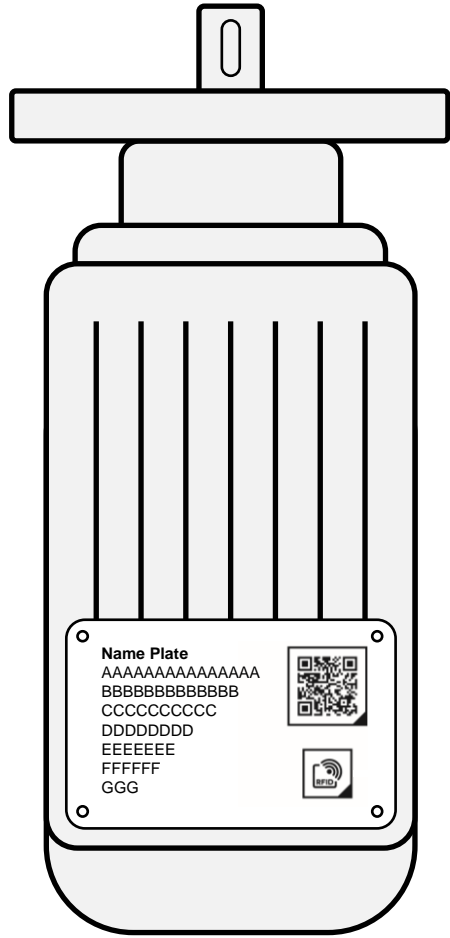
Digital Product Passport or Digital Twin?



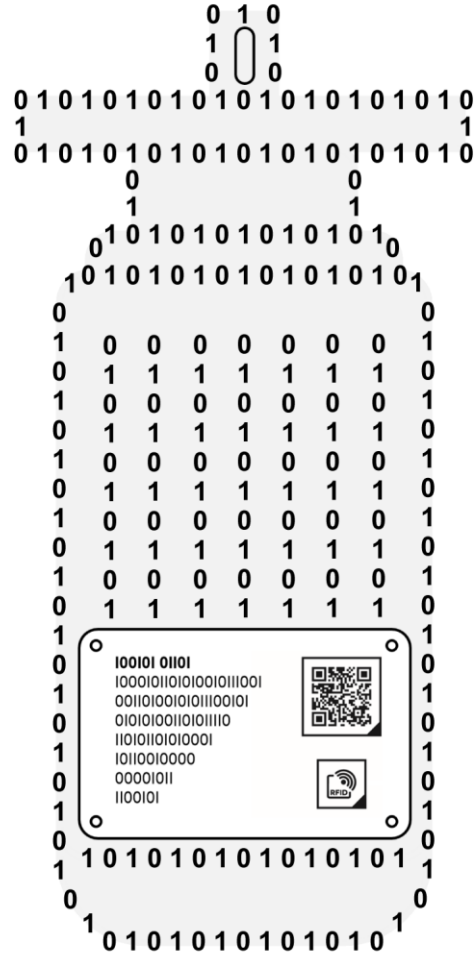


- EU Digital Product Passport is part of EU strategy to digitalize the economy.
- The requirements for the DPP are described in the Ecodesign for Sustainable Product Regulation (ESPR Article 8.).
- DPP will be compulsory for all products put into EU market - except food.
- DPP must provide all information relevant for EU authorities in regards of TAX, Conformity to EU regulations, Recycling, Circularity, etc. like Product carbon footprint, energy efficiency, recycled content, generation of waste material, etc..
- Furthermore, the DPP should provide information necessary for the R-strategies of circularity (... , repair, refurbish, reuse, recycle, ...).
- A back-up copy of the DPP is stored by a (certified) third party DPP service provider.

Simplified data model of a Digital Twin



physical object



digital twin
digital representation of the physical object

functional model

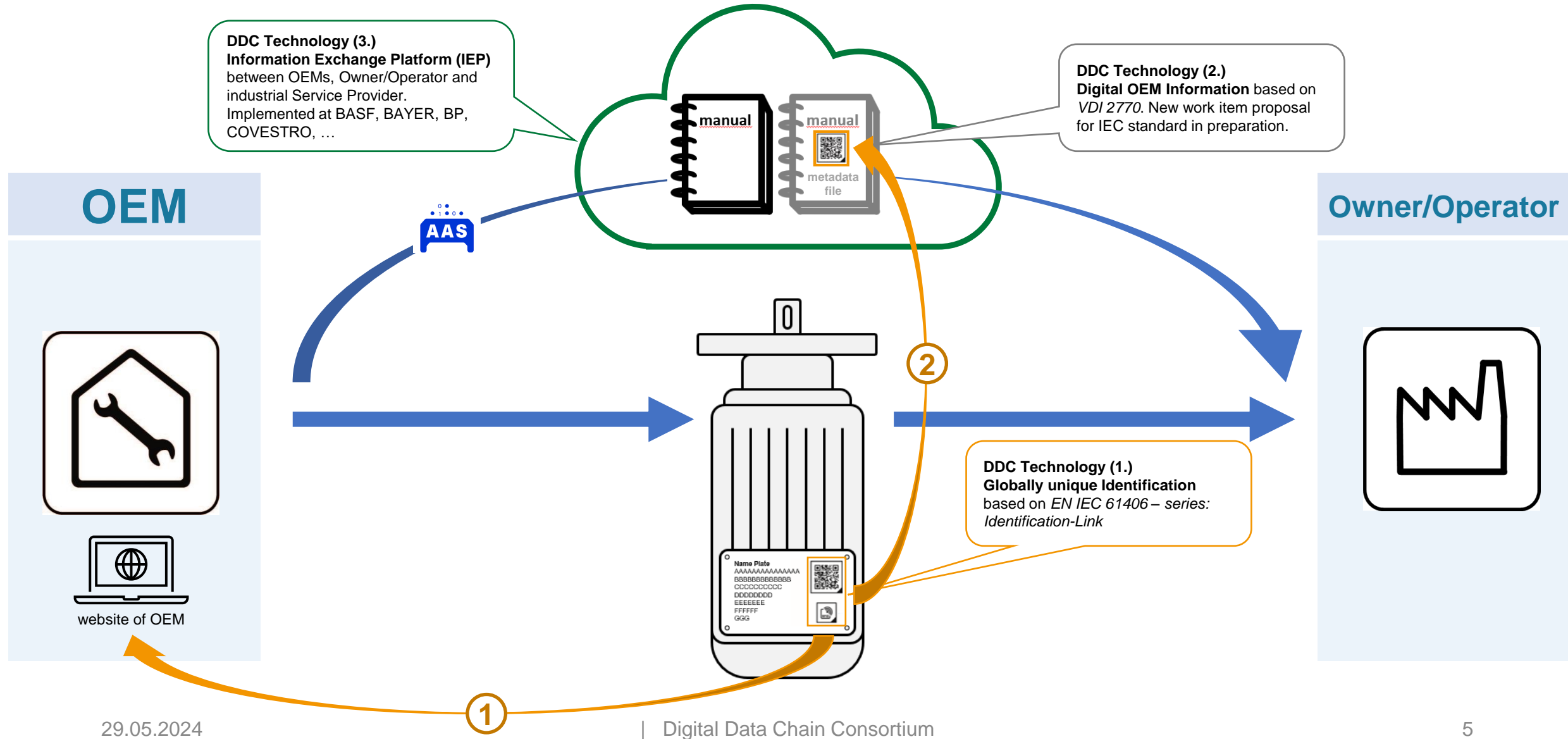
- simulation
- prediction
- condition monitoring
- ...

information model

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



The DIGITAL DATA CHAIN → Combining the technologies





The Digital Data Chain Consortium



Mission & Vision

- foster the spread of the 3 DDC 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.

Within 30 months **more than 55 companies** have joined the Consortium*



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

Furthermore the DDC Consortium is extending its collaboration with other industry organizations:

1. Existing Collaborations



Industrial
Digital
Twin
Association

2. Collaborations in preparation



DEXPI[®] Data Exchange in
the Process Industry



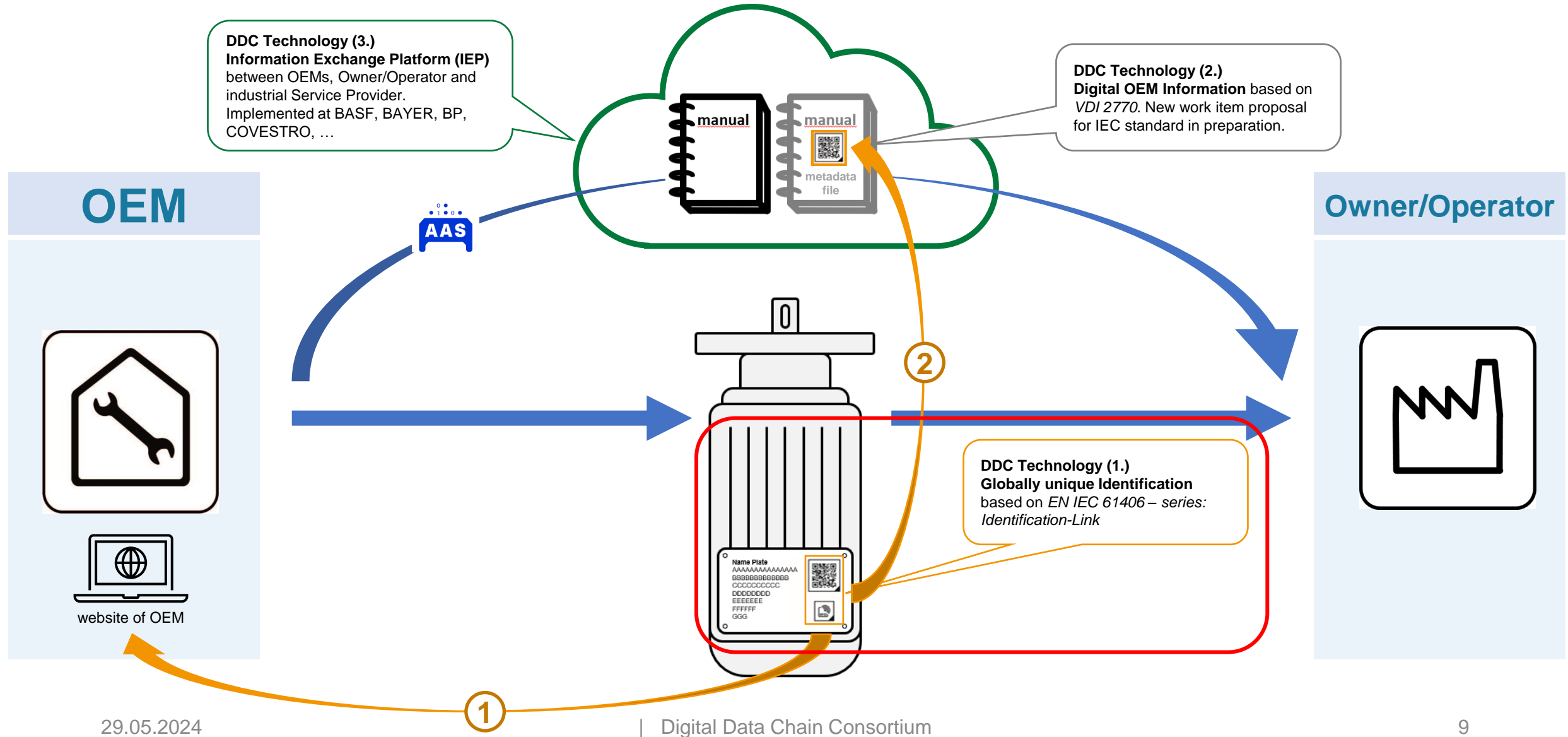
SEIIA.SE Swedish Industrial
Interoperability Association



International
Association
of Oil & Gas
Producers

JIS 1 - Material Passport

The DIGITAL DATA CHAIN → Combining the technologies



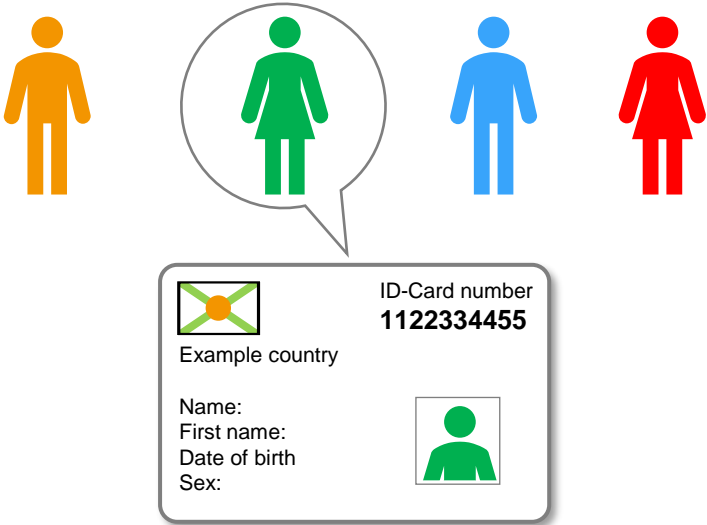
Starting point: multiple legacy ID systems and various requirements



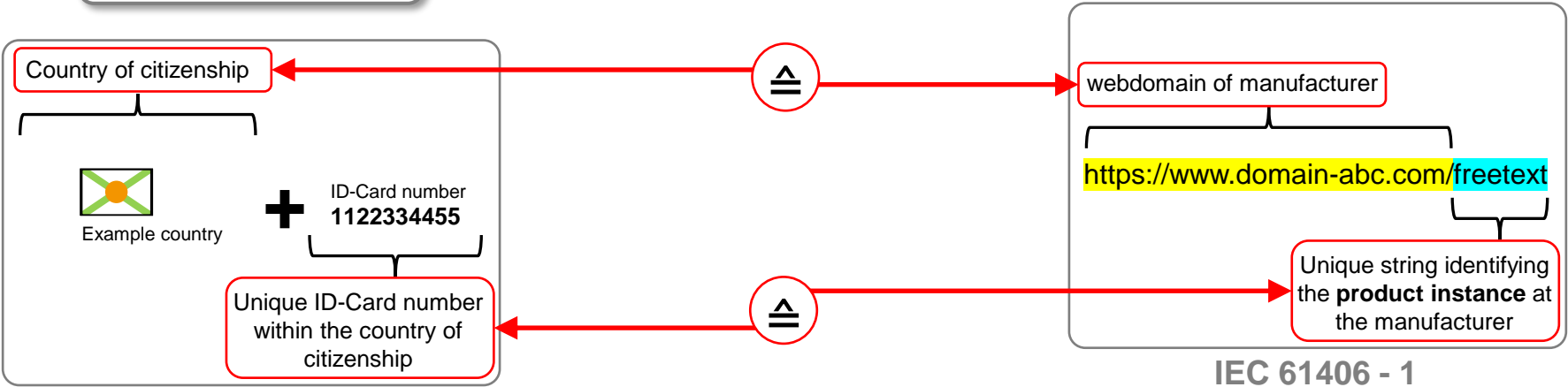
Company name	Company web-domain*	Company type	Industry / branch	Legacy ID system in use	IDs	Interoperable, globally unique object / product identifier	2D-Code / RFID
AAA	aaa-steel.com	medium enterprise	raw materials & commodities	Internationally standardized material name + batch number	H320B 24-04-15-1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

How can all these different legacy ID systems become interoperable, without changing them and all at low or zero cost?

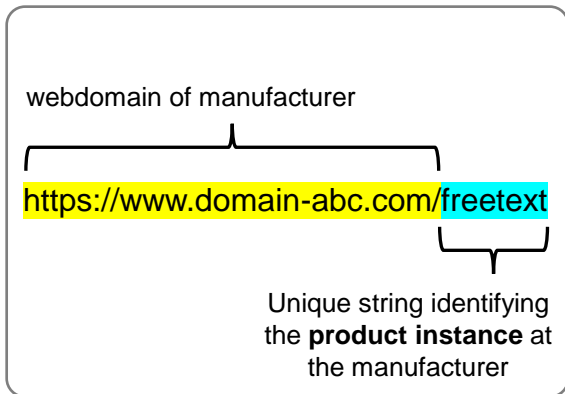
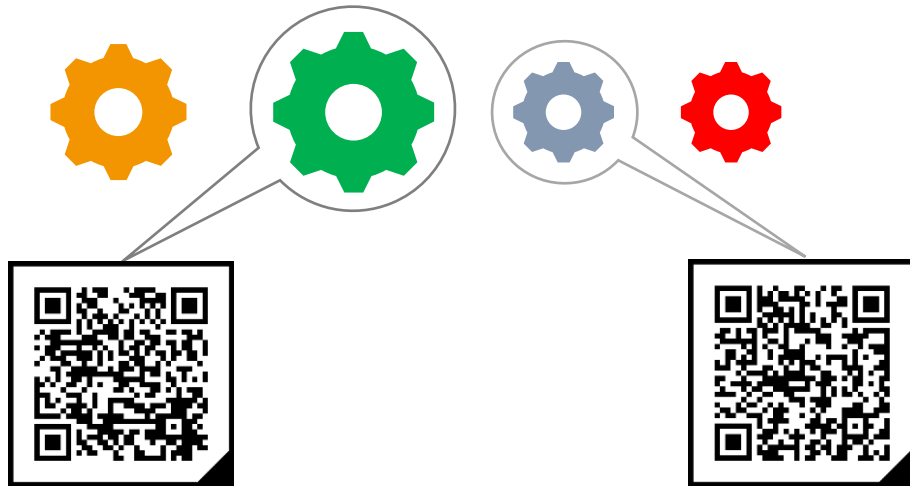
Identification of an individual



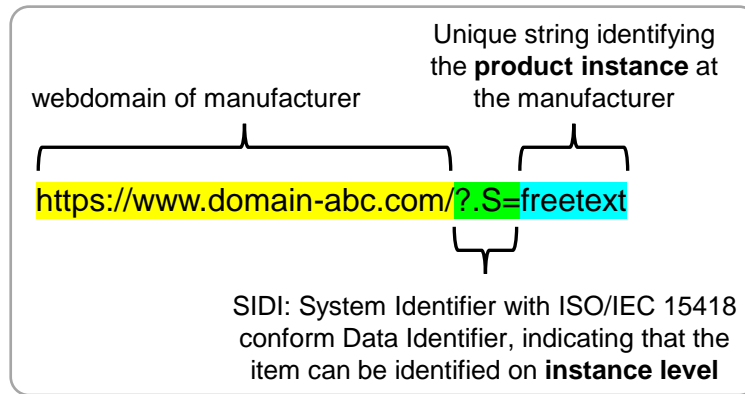
Identification of an individual



Identification of an individuum

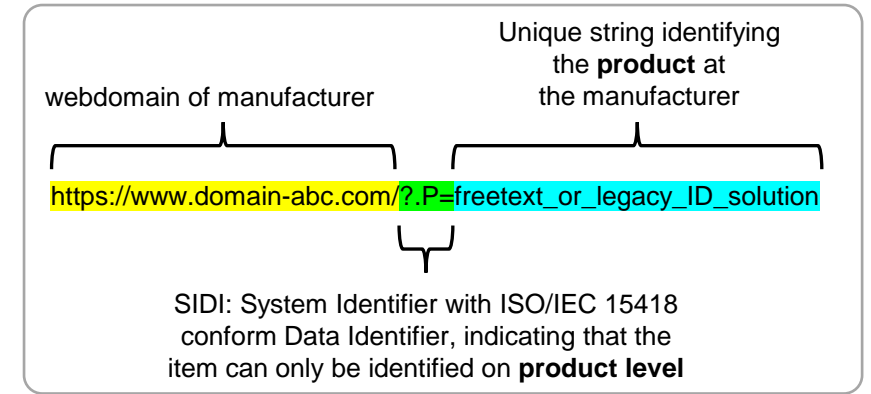
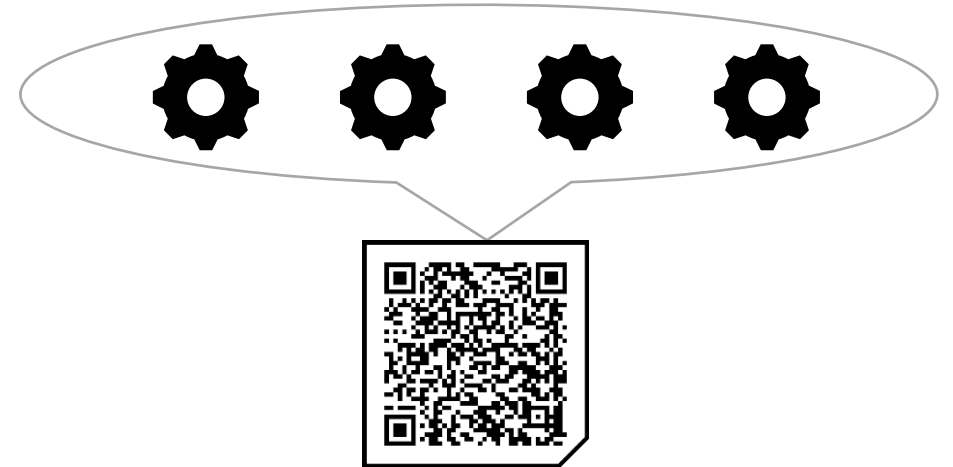


IEC 61406 - 1



IEC 61406 - 2






Identification of an identic group



IEC 61406 - 2

Starting point: multiple legacy ID systems and various requirements

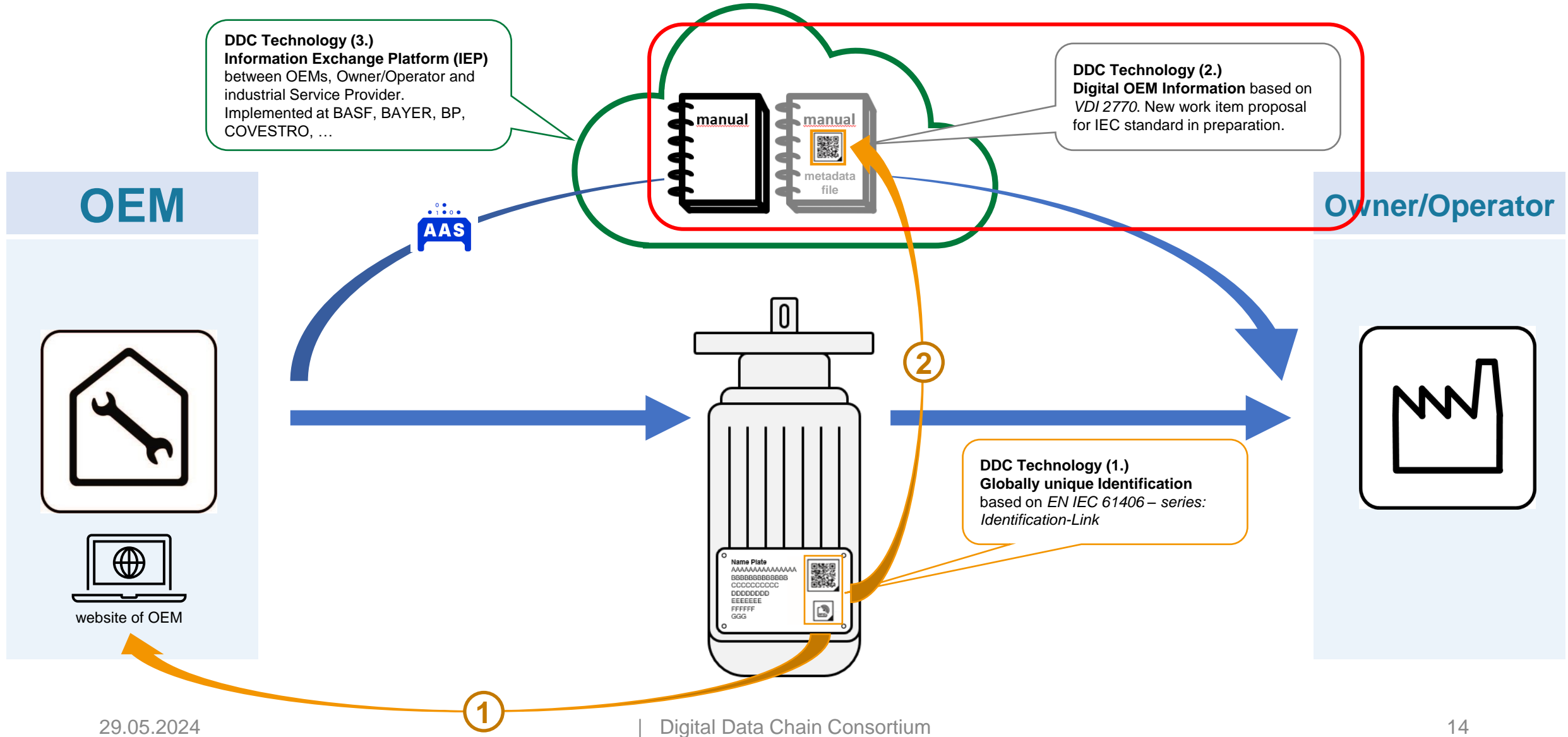


Company name	Company web-domain*	Company type	Industry / branch	Legacy ID system in use	IDs	Interoperable, globally unique object / product identifier created according EN IEC 61406- series – Identification Link	2D-Code / RFID
AAA Steel	aaa-steel.com	medium enterprise	raw materials & commodities	Internationally 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!

The DIGITAL DATA CHAIN → Combining the technologies





classical, „non intelligent“
documentation provisioning

Customer Project ID	LDPE/2021/NA/34-56
Purchase Order nr.	PO-9876-5432
Purchase Order item nr.	32
Engineering Tag nr.	B123-4564-6543
Equi ID or Material nr.	81726354

Filename

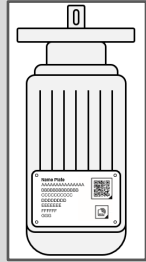
AM-6kvum.pdf

AM-6kvac.pdf

AM-6kvmm.pdf

AM-6kvsp.pdf
AM-6kvsp.xlsx

AM-6kvss.pdf
AM-6kvss.xlsx



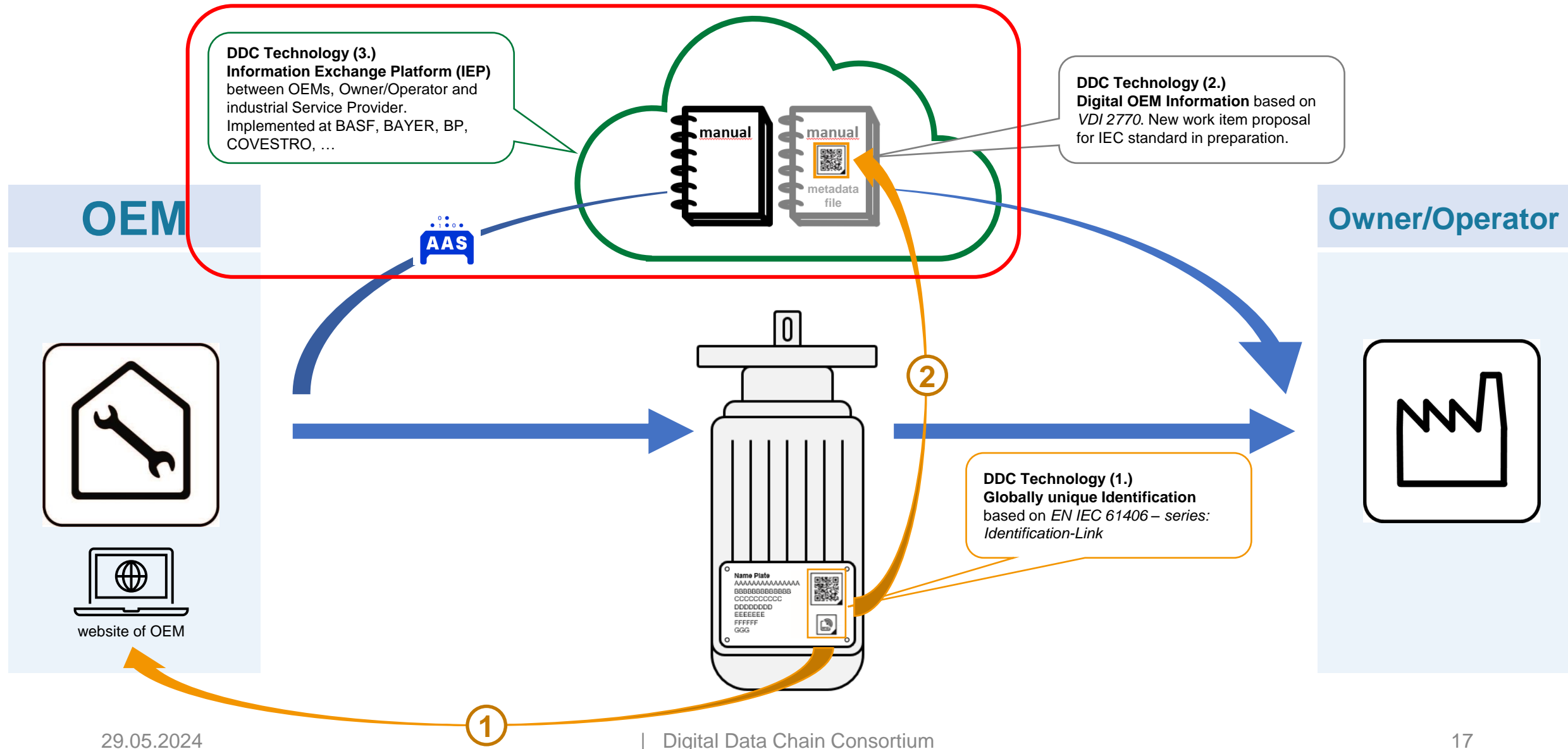
Manufacturer	Test Company AG
Producttype	Asynchron motor
Order Code	AM-6kv-4321
Serialnumber	5678-F
IEC 61406 ID	Test-company.ch/AM-6kv-4321/5678-F

Customer Project ID	LDPE/2021/NA/34-56
Purchase Order nr.	PO-9876-5432
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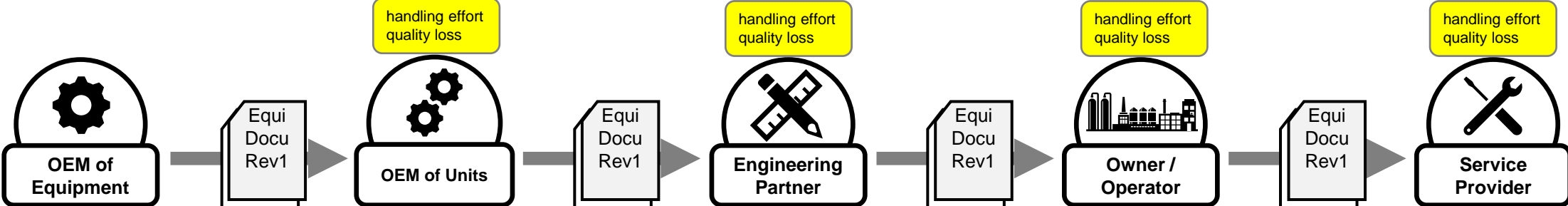
VDI 2770 conform „intelligent“ documentation provisioning

Filename	Title	description	keywords	document ID	VDI 2770 classification	IEC 61355 classification	language
AM-6kvum.pdf	manual	user manual	operation, use, start up,	Um-AM-6kv-4321-2021-FA	03-02 Operation	DC	EN
AM-6kvac.pdf	Ex-certificate	ATEX-certificate	explosion prevention	Ac-AM-6kv-4321-2021-FA	02-04 Certificates	QC	EN, DE, FR
AM-6kvmm.pdf	maintenance manual	Inspection & maintenance manual	inspection, maintenance,	Ac-AM-6kv-4321-2021-FA	03-04 Inspection, maintenance	DC	EN
AM-6kvsp.pdf AM-6kvsp.xlsx	spare parts	spare part list	casing, fan, shaft, bearing	Ac-AM-6kv-4321-2021-FA	03-06 Spare parts	PB	EN
AM-6kvss.pdf AM-6kvss.xlsx	spec-sheet	technical specification sheet	power, torque	Ss-AM-6kv-4321-2021-FA	02-01 Technical specification	EC	EN

The DIGITAL DATA CHAIN → Combining the technologies

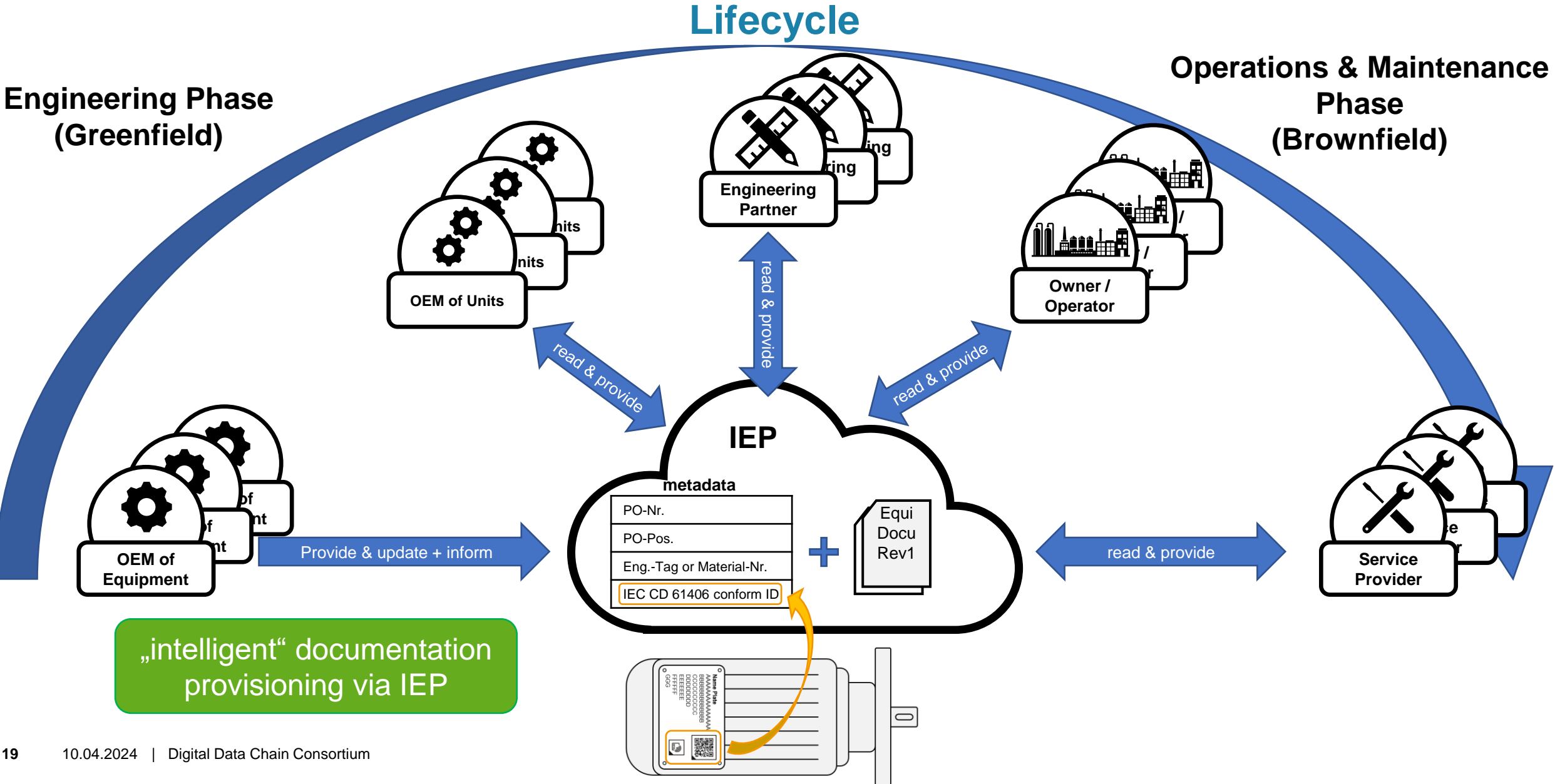


Digital Data Chain (DDC) technologies → the Information Exchange Platform (IEP)

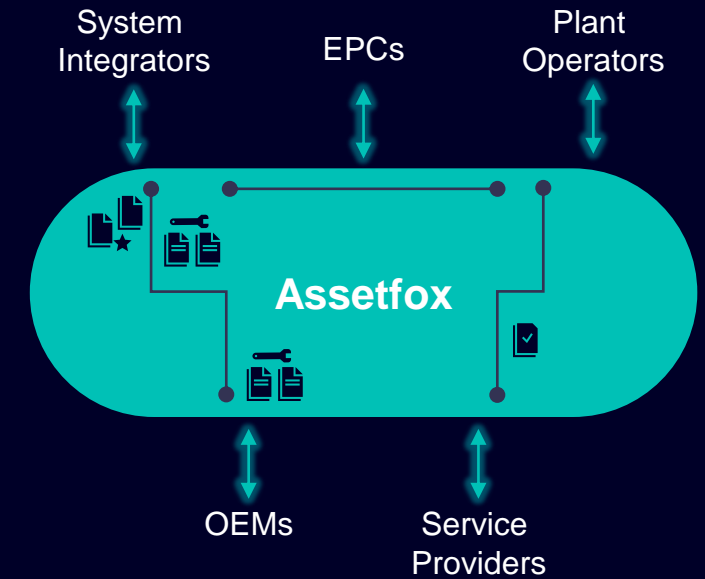
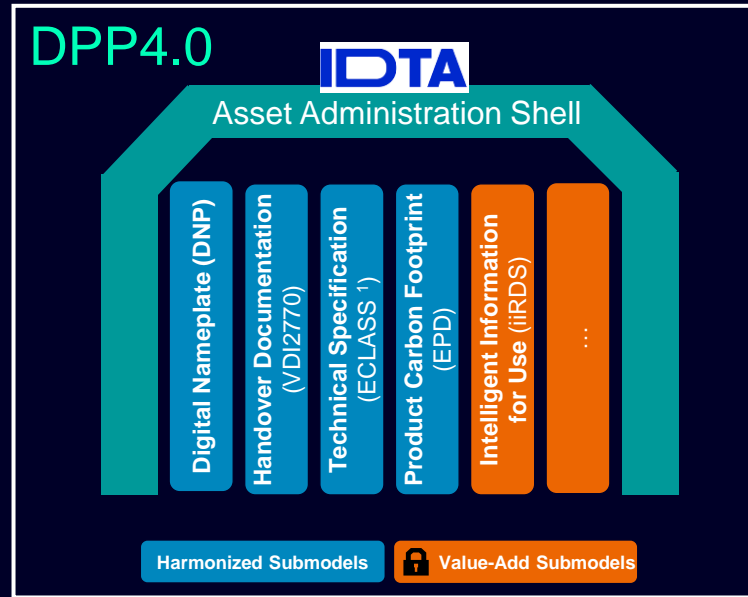


classical, „non intelligent“
documentation provisioning

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



Digital Data Chain: Providing “Digital Twins” at our customers fingertips to increase workflow efficiency significantly and setting the stage for the upcoming Digital Product Passport requirements



1 Product Identification

» Identification Link according to IEC 61406-1 provides significant OPEX reduction by avoiding search time in workflows

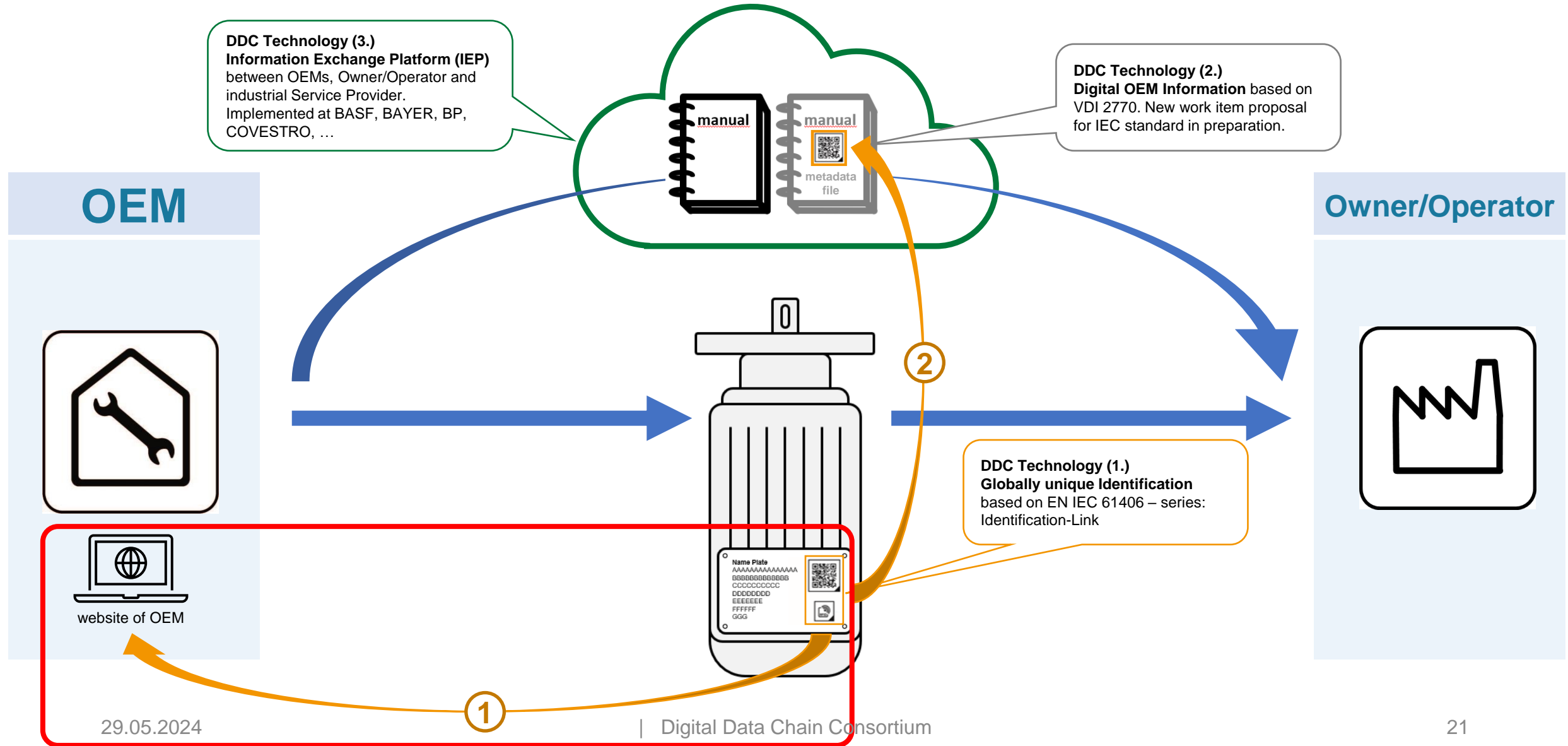
2 Provisioning Service

» Reducing the Product Carbon Footprint (PCF) and costs by generating and accessing standardized product information “Digital Twin” via AAS (IEC 63278)

3 Information Exchange Platform

» Seamless & easy exchange of Digital Twins and corresponding Apps via AAS in an ecosystem of shareholders over the entire lifecycle

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

Asset Information <https://siemens.com/1P6GK5206-2BS00-2AC2/0/0>

Nameplate <https://siemens.com/1P6GK5206-2BS00-2AC2/Nameplate>



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
- (12) XC-200 managed
- (13) managed switch Layer 2 IE Switch
- (14) 6GK5206-2BS00-2AC2
- (15) 6GK5206-2BS00-2AC2
- (16)
- (17) SCALANCE XC206-2SFP
- (18) Oetische Sternbrückenstraße 50 • Karlsruhe • DE
- (19) (not analyzed)
- (20)
- (21)
- (22)

AASX 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) No errors Clear Log

What is AutolD 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.

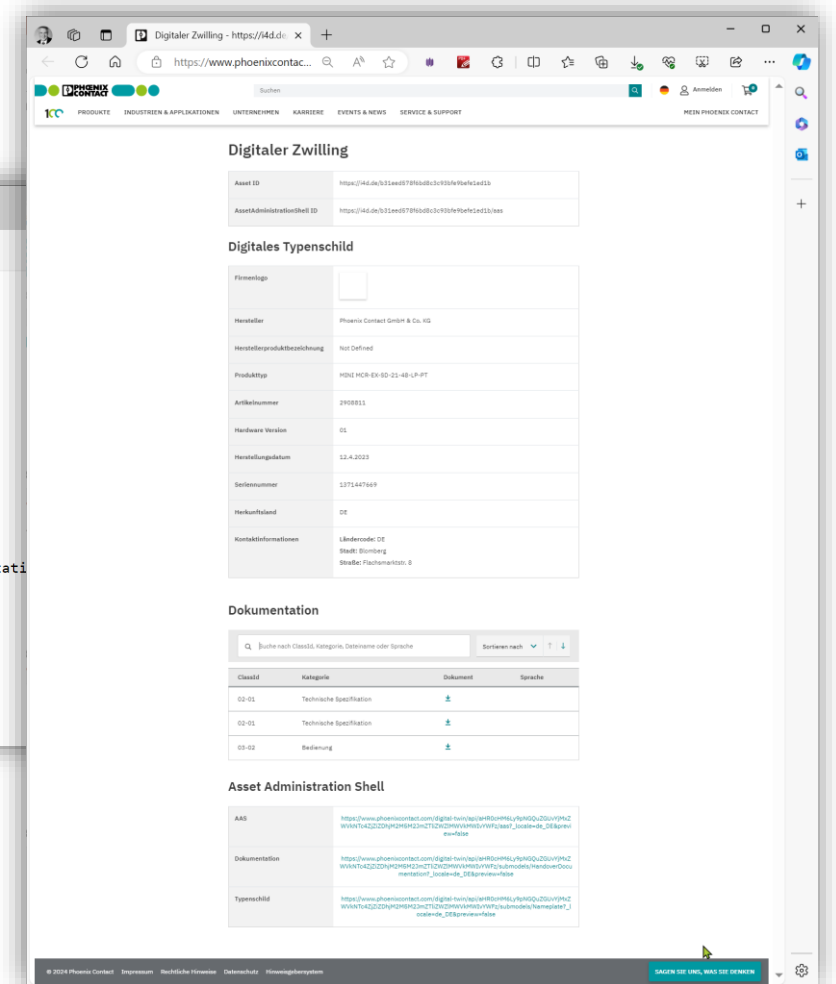
Identification Link , Asset Administration Shell and its Viewer



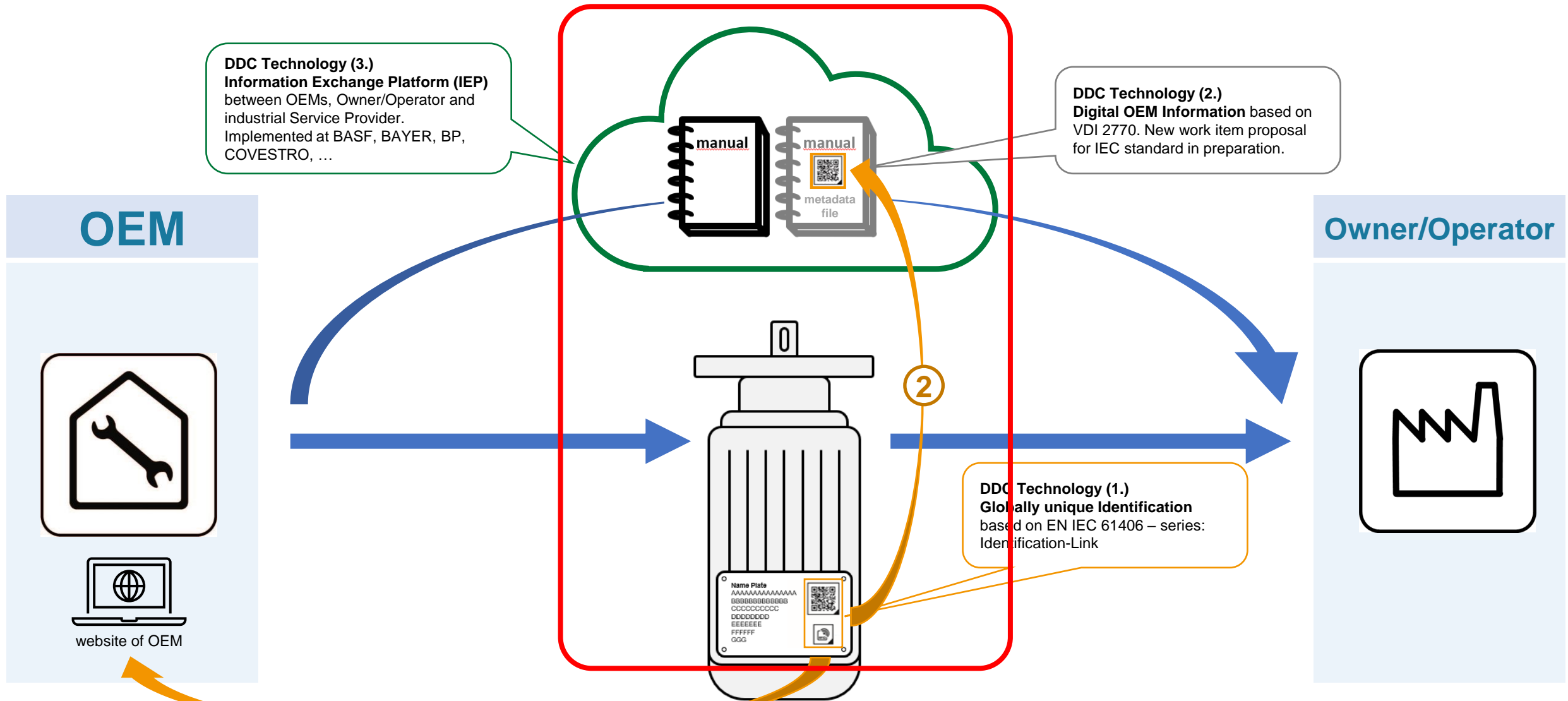
Asset Administration Shell

```
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  "id": "https://i4d.de/b31eed578f6bd8c3c93bfe9befe1ed1b/aas",
  "idShort": "aas_297f9b",
  "derivedFrom": {
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    } ]
  },
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  },
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    } ]
  }, {
    "keys": [ {
      "value": "https://i4d.de/b31eed578f6bd8c3c93bfe9befe1ed1b/submodel/Nameplate"
    } ]
  } ]
}
```

<https://i4d.de/b31eed578f6bd8c3c93bfe9befe1ed1b>





The DIGITAL DATA CHAIN → Combining the technologies




Show Toolbar

Explorer

 **Network switch (general application)**
Equipment ID: VPS2333225

 **Equipment Type** **Brand**

Network switch (general applicatio... | Siemens



- PROPERTIES (104/106)
- DOCUMENTS (16)
- OTHER FILES (1)
- PICTURES (1)
- RELATIONSHIPS (1)
- EXTERNAL LINKS

Equipment ID *	VPS2333225
Record status *	Active
Equipment Type	Network switch (general application)
Height	147 mm
Width	60 mm
Depth	125 mm
Min. ambient temperature during operating phase	-40 °C
Max. ambient temperature during operating phase	+70 °C
Layer 2 present	Yes
Layer 3 present	No
Layer 4 present	No
Layer 7 present	No
Number of ports 10 Mbps RJ45	6
Number of ports 1000 Mbps RJ45	2

Show Toolbar

Explorer


Network switch (general application)
 Equipment ID: VPS2333225


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 Network switch (general application... Siemens


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Explorer

Network switch (general application) **Equipment Type** **Brand**

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<> PROPERTIES (104/106) DOCUMENTS (16) OTHER FILES (1) PICTURES (1) RELATIONSHIPS (1) EXTERNAL LINKS

Type	File Name ↑	Document ID	Document Name	Document Type	Document Type ID	Record Status	Originator	Language	Key Words	More
	2022322310004772.pdf	2022322310004770	Certificate for Chin...	Certificate	D00020	Active	Siemens	EN	Certificate	
	6GK52062BS002AC2_dat...	6GK52062BS002AC2	Data sheet	Data sheet	D00178	Active	Siemens	EN	Datasheet	
	BA_SCALANCE-XC-200_7...	C79000-G8976-C442-14	Operating Instructio...	Manual	CFIHOS-70000249	Active	Siemens	EN	Operating; Manual, C...	
	c02-suppliers_declar...	ACMA form - C02	Declaration of Confo...	Declaration	D00128	Active	Siemens	EN	Declaration; Conform...	
	IITS2_059855_0002_Re...	IITS2 059855 0002	Product Lifecycle Ce...	Certificate	CFIHOS-70000239	Active	Siemens	EN	Product; Lifecycle; ...	
	marine_en.pdf	PDPA-B10066-00-7600	General brochure	Product leaflet	D00188	Active	Siemens	EN	Product; Catalogue; ...	
	MSDoC_A5E53571242A_R...	A5E53571242A	Declaration of Confo...	Declaration	D00128	Active	Siemens	EN	Declaration; Conform...	
	NW_SIMATIC-NET-Gloss...	C79000-G8976-C259-08	Glossary - Specialis...	Glossary		Active	Siemens	EN	Glossary, Acronym	
	PH_SCALANCE-XB-200-X...	C79000-G8976-C361-15	Configuration Manual	Manual	CFIHOS-70000249	Active	Siemens	EN	Configuration; Manua...	
	PH_SCALANCE-XB-200-X...	C79000-G8976-C360-15	Programming Manual	Manual	CFIHOS-70000249	Active	Siemens	EN	Programming; Manual	
	PH_SCALANCE-XB-200-X...	C79000-G8976-C360-14	Configuration Manual	Manual	CFIHOS-70000249	Active	Siemens	EN	Configuration; Manua...	
	RoHS_CHN_PD-PA-CI_20...	RoHS_CHN_PD-PA-CI	Hazardous Substances	Declaration	CFIHOS-70000434	Active	Siemens	EN	Hazardous; Substance...	
	Scalance_XC208_Switc...	DI_PA_EPD20045.01	Environmental produc...	Declaration	CFIHOS-70000434	Active	Siemens	EN	Environment; Carbon;...	
	Selection_list_top...	6ZB5711-0BK30-0AA8	General brochure	Product leaflet	D00188	Active	Siemens	EN	Product; Catalogue; ...	
	UL60950-1_-XC2xx.pd...	20160721-E115352	UL Certificate of Co...	Certificate	CFIHOS-70000239	Active	Siemens	EN	Certificate; UL 6095...	

SAP Business Network for Asset Collaboration

< **SAP** Equipment ▾
🔍 ⓘ ST

37000000 / 37010000 / LESER 433 - SAFETY VALVE /

LESER 433 - SAFETY VALVE ✓

10136145

Manage ▾
☆
📦
⚙️
🔗

Manufacturer: [LESER](#)
ID Link
Shared By: 1 Partners
Functional Location: [E60](#)
External IDs
Status: [Published](#)
Languages: [EN](#)

⏪ ⏩

INFORMATION ▾
STRUCTURE & PARTS ▾
DOCUMENTATION ▾
MAINTENANCE & SERVICE ▾
TIMELINE

Documents

All (16)

Equipment (7)

Models (9)

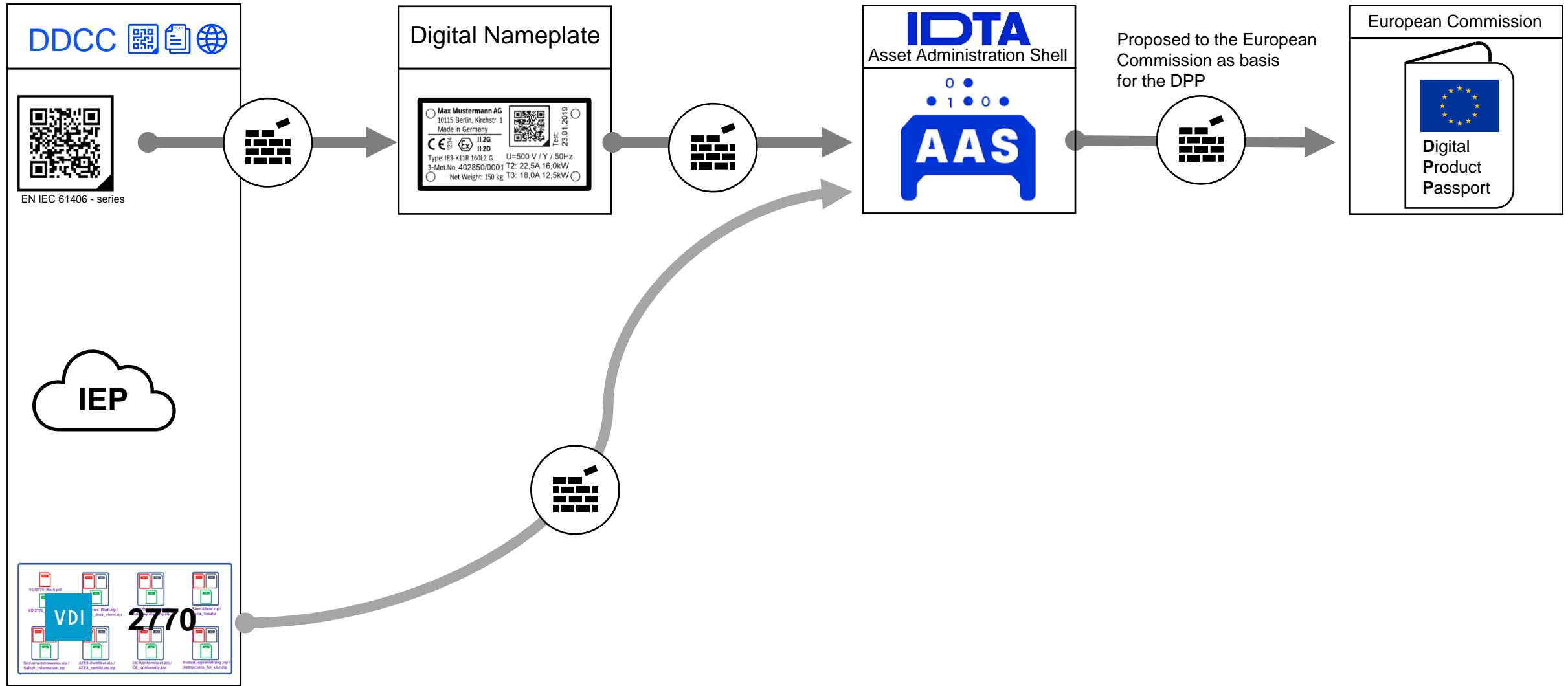
Locations (0)

Tagged Images (0)

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	Document	File Name	File Type	Confidentiality	Phase	Category	Language	Source	File Size	From	Changed On
<input type="checkbox"/>	Abnahmedokument D.POCOPE.7	Abnahmedokument_Dummy.pdf More	PDF		Acquisition	Others	German	SAP PoC Operator	7 KB		2021-07-01
<input type="checkbox"/>	Zeichnung D.POCOPE.9	Zeichnung_Dummy.pdf More	PDF		Design / Installation	Drawings/Schemes	German	SAP PoC Operator	7 KB		2021-07-01
<input type="checkbox"/>	Zertifikat D.POCOPE.4	10259764_Cert_10956330_DE.pdf More	PDF		Operation	Certificates	German	SAP PoC Operator	447 KB		2021-07-01
	Bestellung	02 BASF									

DIGITAL DATA CHAIN → relation to other standards and technologies



building block for

to support the DDC and DPP 4.0 based on AAS?

The standardization of the DPP at CEN/CENELEC has started in April 2024 and will be finished in Dezember 2025!

Currently, most participants in the standardization working groups are representing the consumer goods sector, but not the industrial / b2b sector.

We need your help and expertize to shape the EU DPP for the industry,
Please join the CEN/CENELEC JTC 24 mirror groups of your national standardization organization and become a delegated expert to CEN/CENELEC JTC 24.

If you want to insure that the EU DPP also covers the industry and b2b requirements ...

the time to act is now 😊



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