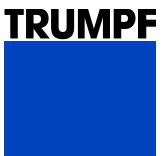


Eine Initiative des
An Initiative by **VDW**

Forum New Technologies – EMO 2019

The role of standardized interfaces for the machine tool industry

Andreas Wohlfeld | TRUMPF Werkzeugmaschinen GmbH + Co. KG



TRUMPF is...



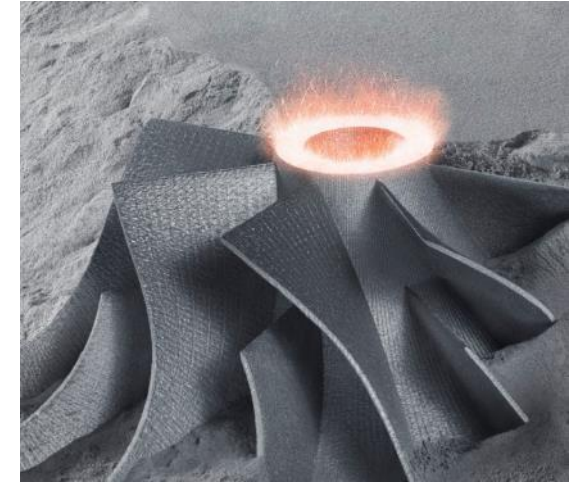
**Family business
since 1923**



**Technology leader in
two business divisions**



**Close to its customers
with 77 subsidiaries**

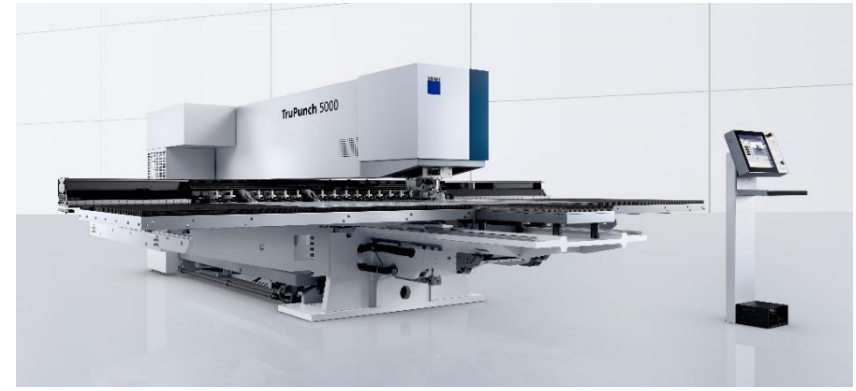


**Innovation promise –
holistically and constantly**

Business division machine tools



Machines for laser cutting



Machines for punching



Machines for bending



Machines for tube handling

Laser Applications

Broad spectrum: Applications with TRUMPF lasers

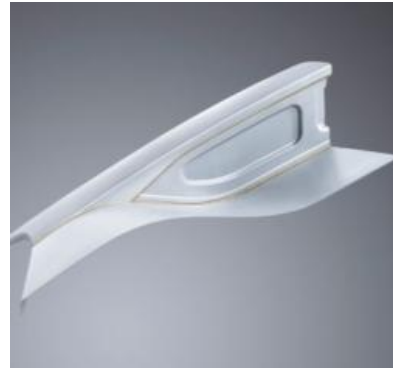
Cutting



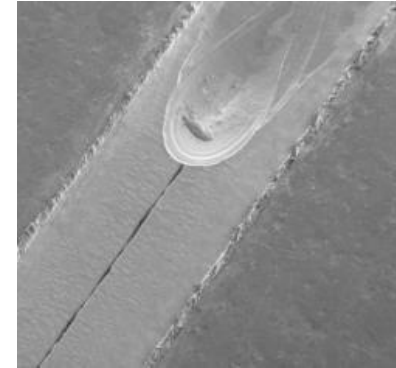
Welding



Brazing



Drilling /Ablation



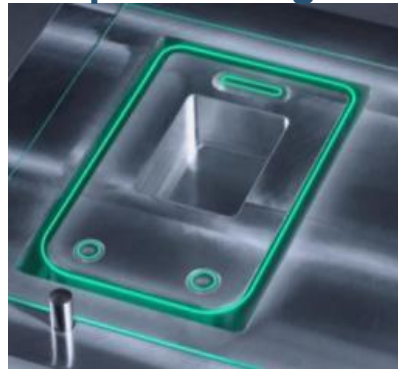
Micro-processing



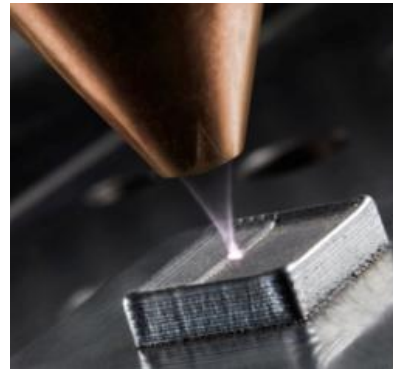
**Marking /
Engraving**



**Plastics and glass
processing**



3D printing



**EUV
Lithography**



**Scientific
Applications**



TRUMPF

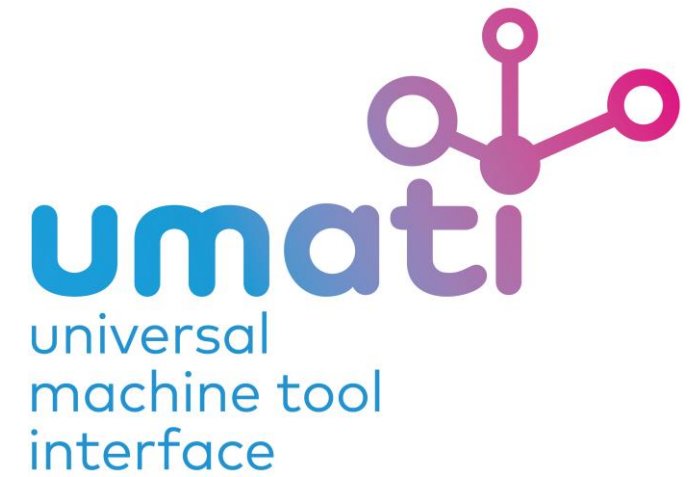


Committed to innovation

TRUMPF



Committed to innovation

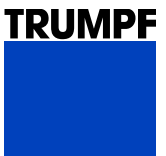


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The role of standardized interfaces for the machine tool industry

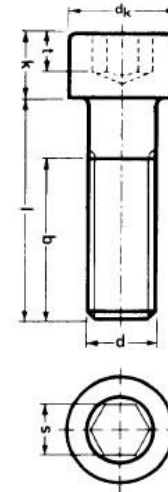
Andreas Wohlfeld | TRUMPF Werkzeugmaschinen GmbH + Co. KG





DIN 912

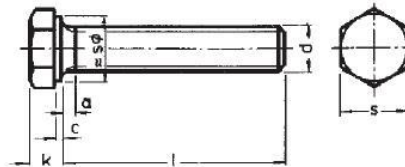
Zylinderschraube mit Innensechskant



d	M 1,4	M 1,6	M 2	M 2,5	M 3	M 4	M 5
s	1,3	1,5	1,5	2	2,5	3	4
t min.	0,6	0,7	1	1,1	1,9	2,5	4,58
b max.	10	12	14	16	18	20	22
k max.	1,4	1,6	2	2,5	3	4	5
dk max.	2,6	3	3,8	4,5	5,68	7,22	8,72

Sechskantschrauben mit Gewinde bis Kopf 8.8 verzinkt

DIN 933



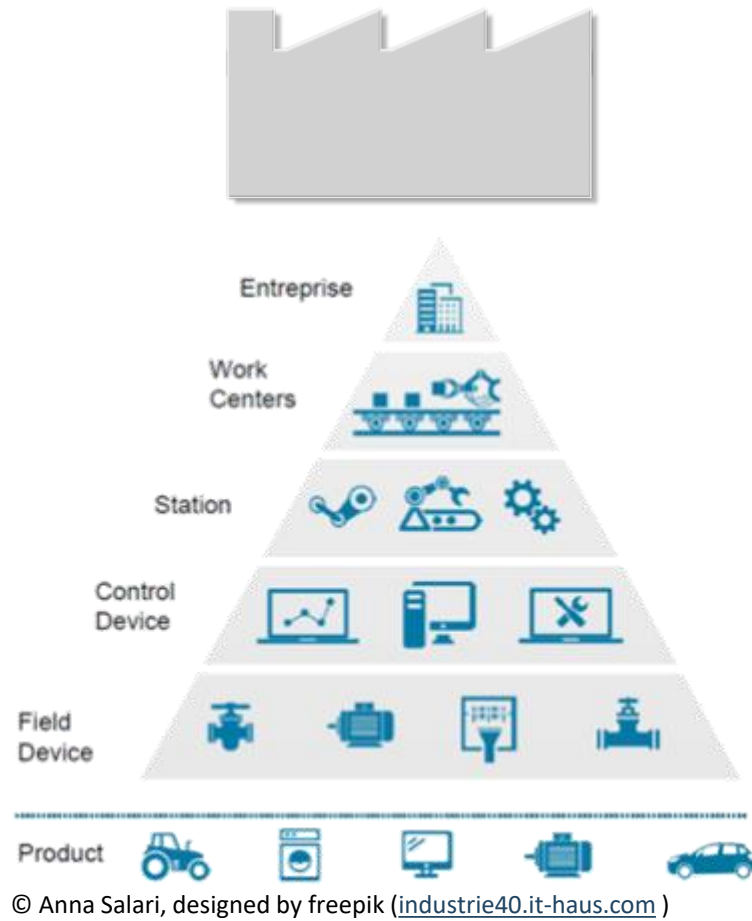
Maße in mm

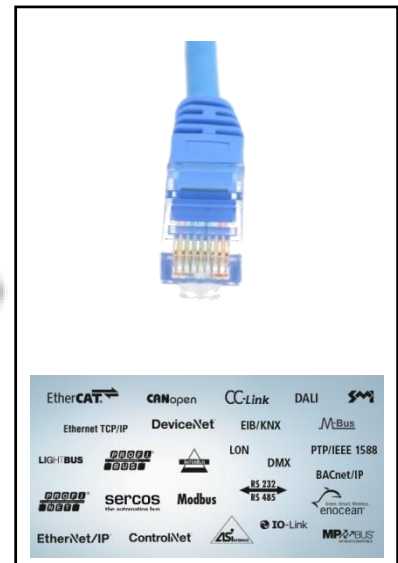
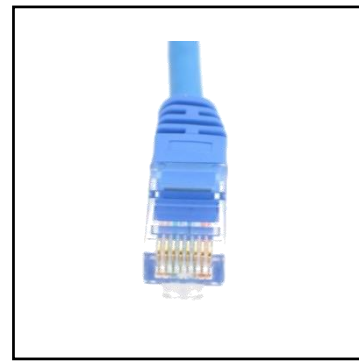
Gewinde d	M 2	M 2,5	M 3	M 4	M 5	M 6	M 7	M 8	M 10	M 12
a max	1,2	1,35	1,5	2,1	2,4	3	3	3,8	4,5	5,3
c max	0,25	0,25	0,4	0,4	0,5	0,5	0,5	0,6	0,6	0,6
k	1,4	1,7	2	2,8	3,5	4	4,8	5,3	6,4	7,5
s	4	5	5,5	7	8	10	11	13	17(16)	19(18)
Gewinde d	M 14	M 16	M 18	M 20	M 22	M 24	M 27	M 30	M 36	
a max	6	6	7,5	7,5	7,5	9	9	10,5	12	
c max	0,6	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	
k	8,8	10	11,5	12,5	14	15	17	18,7	22,5	
s	22(21)	24	27	30	32(34)	36	41	46	55	

l = Nennlänge

schraubenbude.de

xxl-modellbau.de





[wikimedia commons] RJ45 20070127 002 / Beckhoff

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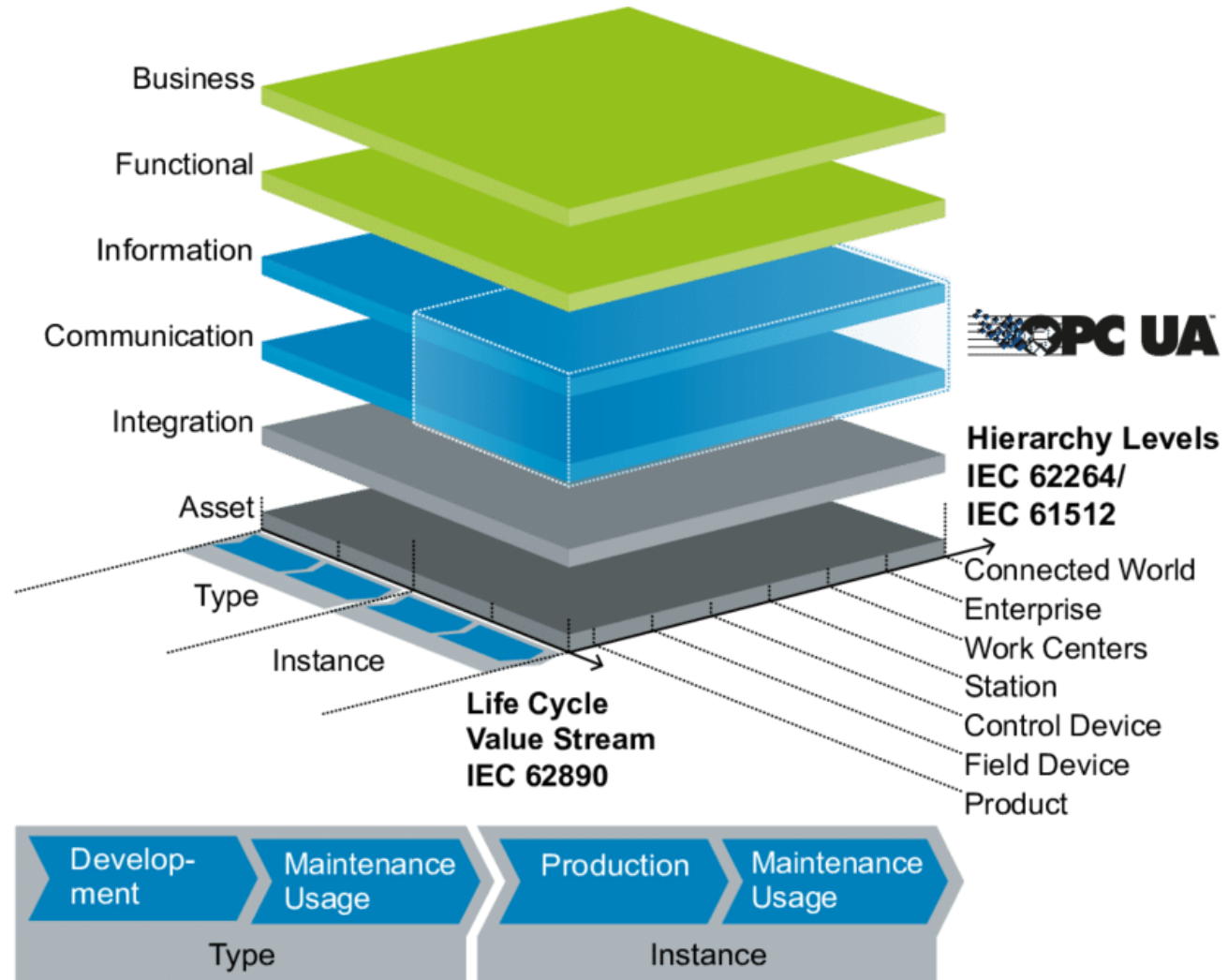


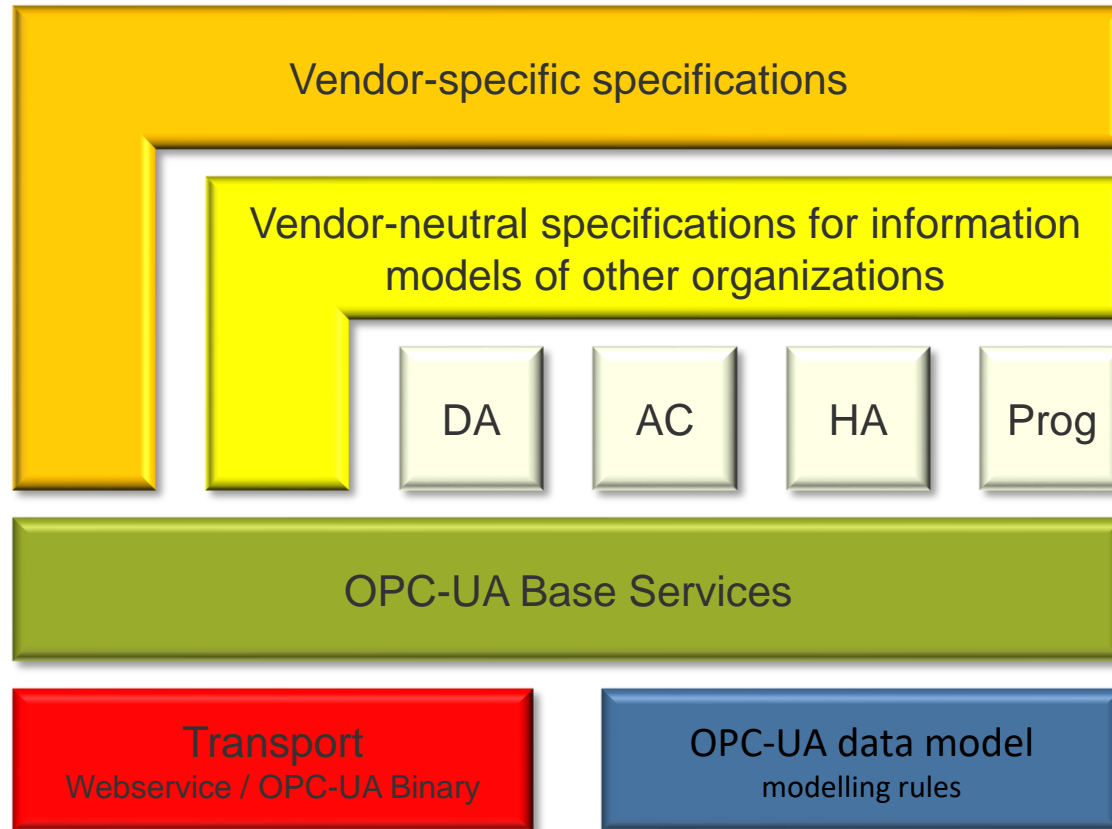
OSI-Schicht	TCP/IP-Schicht	Beispiel
Anwendungen (7)	Anwendungen	HTTP, UDS, FTP, SMTP, POP, Telnet, OPC UA
Darstellung (6)		
Sitzung (5)		
		SOCKS
Transport (4)	Transport	TCP, UDP, SCTP
Vermittlung (3)	Internet	IP (IPv4, IPv6), ICMP (über IP)
Sicherung (2)	Netzzugang	Ethernet, Token Bus, Token Ring, FDDI, IPoAC
Bitübertragung (1)		

[wikipedia.org] TCP/IP-Referenzmodell



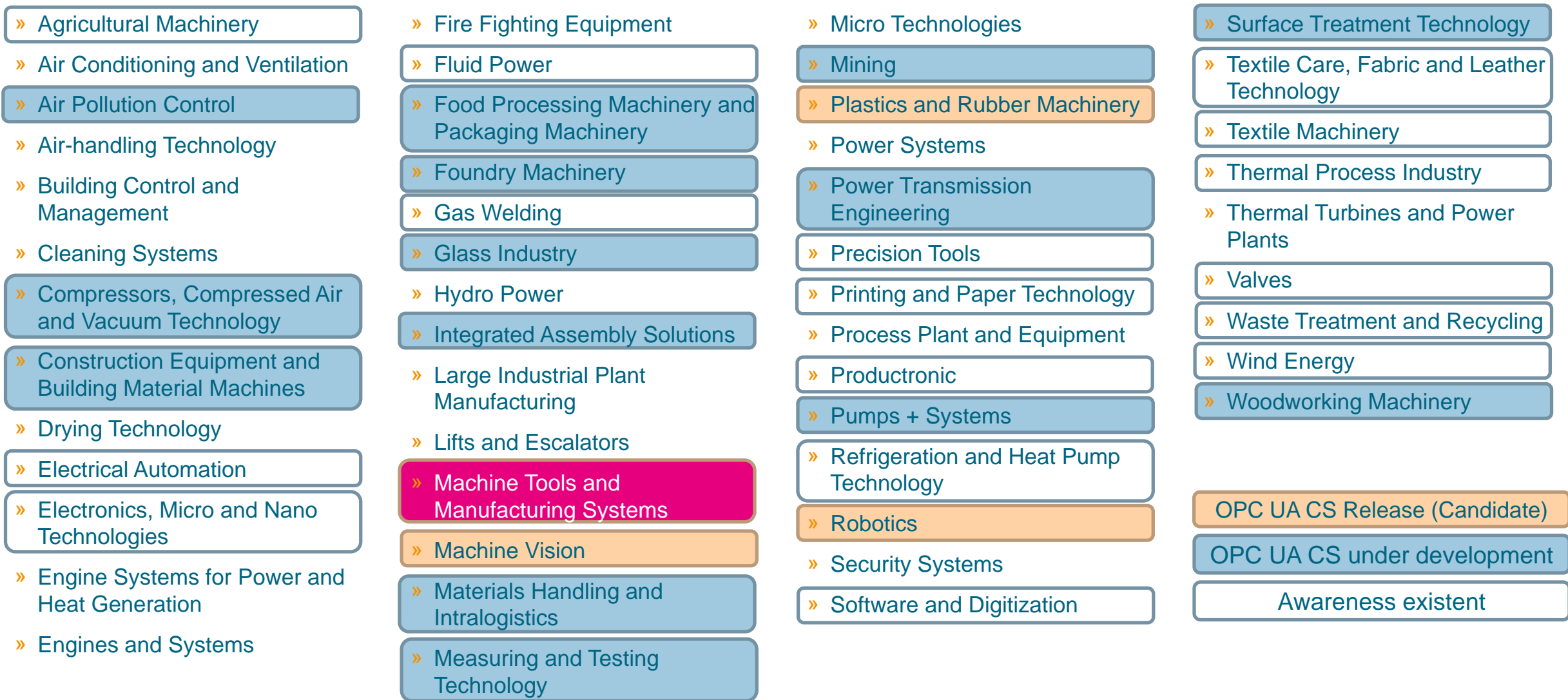
[wikimedia commons] RJ45 20070127 002





nach: [Wikipedia](#)

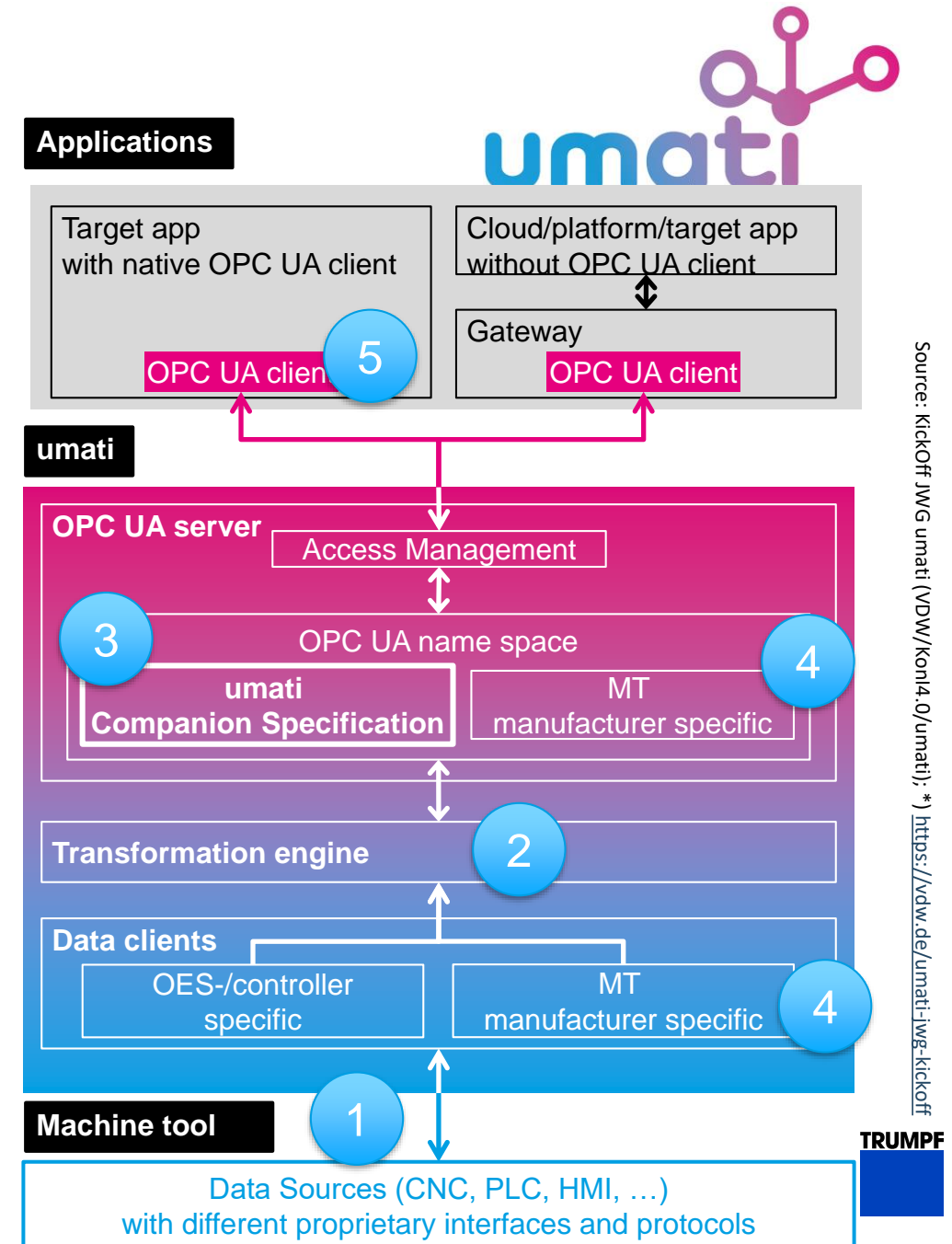
Today's position on OPC UA in the VDMA organizational units



Background: Architecture

umati OPC UA CS - part of a broader project

- 5 **Application Layer:** OPC UA clients enable unified access to data to create added value
 - 4 **Manufacturer-specific or customer specific extensions:** ensure the openness and flexibility required to include not (yet) standardized parameters and interfaces
 - 3 **OPC UA-server:** Communication „to the outside world“ is enabled through the standardized semantics and unified information model specified in the umati OPC UA Companion Specification
 - 2 **Transformation engine:** Data acquired from the machine needs to be mapped or transformed (logically, mathematically) to the standardized targeted semantics
 - 1 **Data Sources, Data Clients:** A machine tool (MT) comprises several data sources (CNC, PLC, HMI, ...). For each of these data sources protocols, a specific data client is require to connect to the existing interface
- ➔ (2), (3) an (4) are supposed to be **directly integrated into future versions of machine tools controllers**

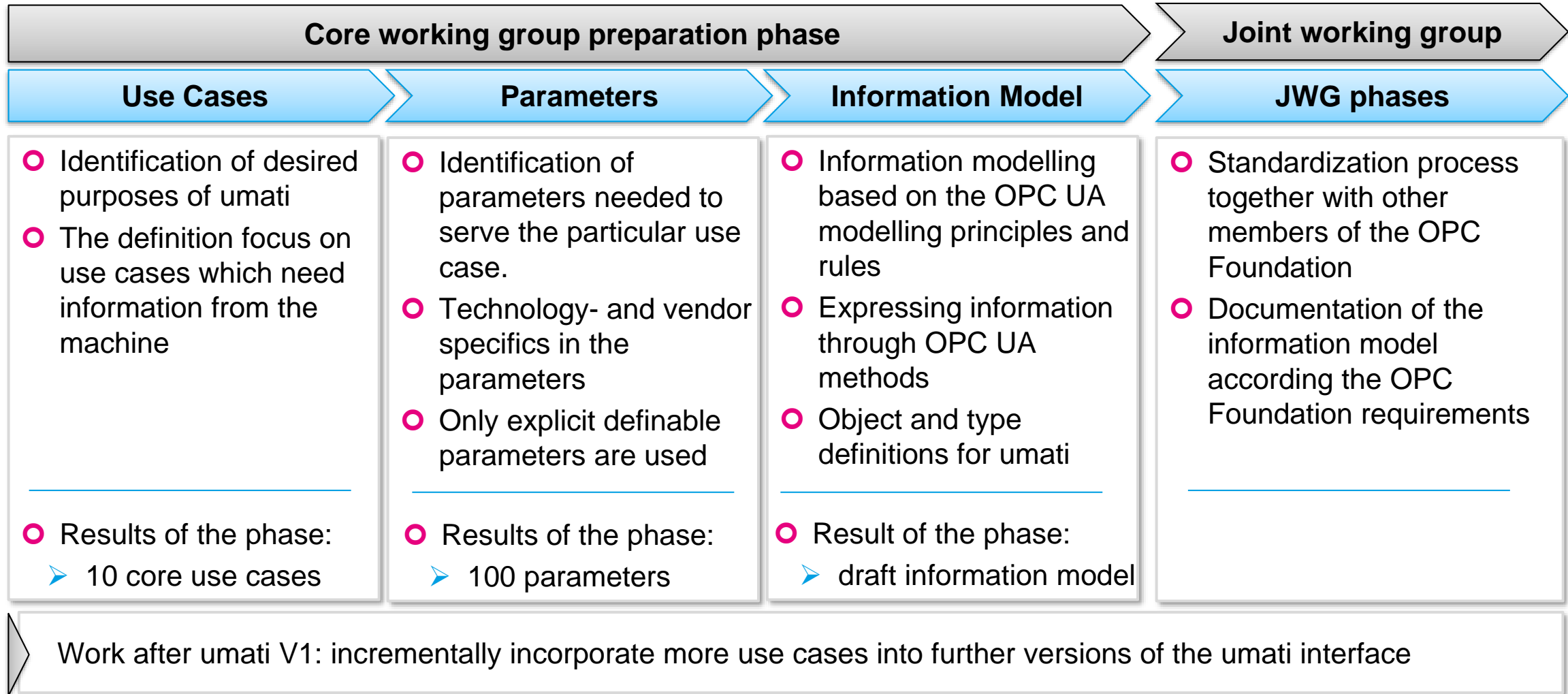


Source: KickOff JWG umati (VDW/Kon14.0/umati); *) <https://vdw.de/umati-iwg-kickoff>



umati Companion Specification

umati design procedure

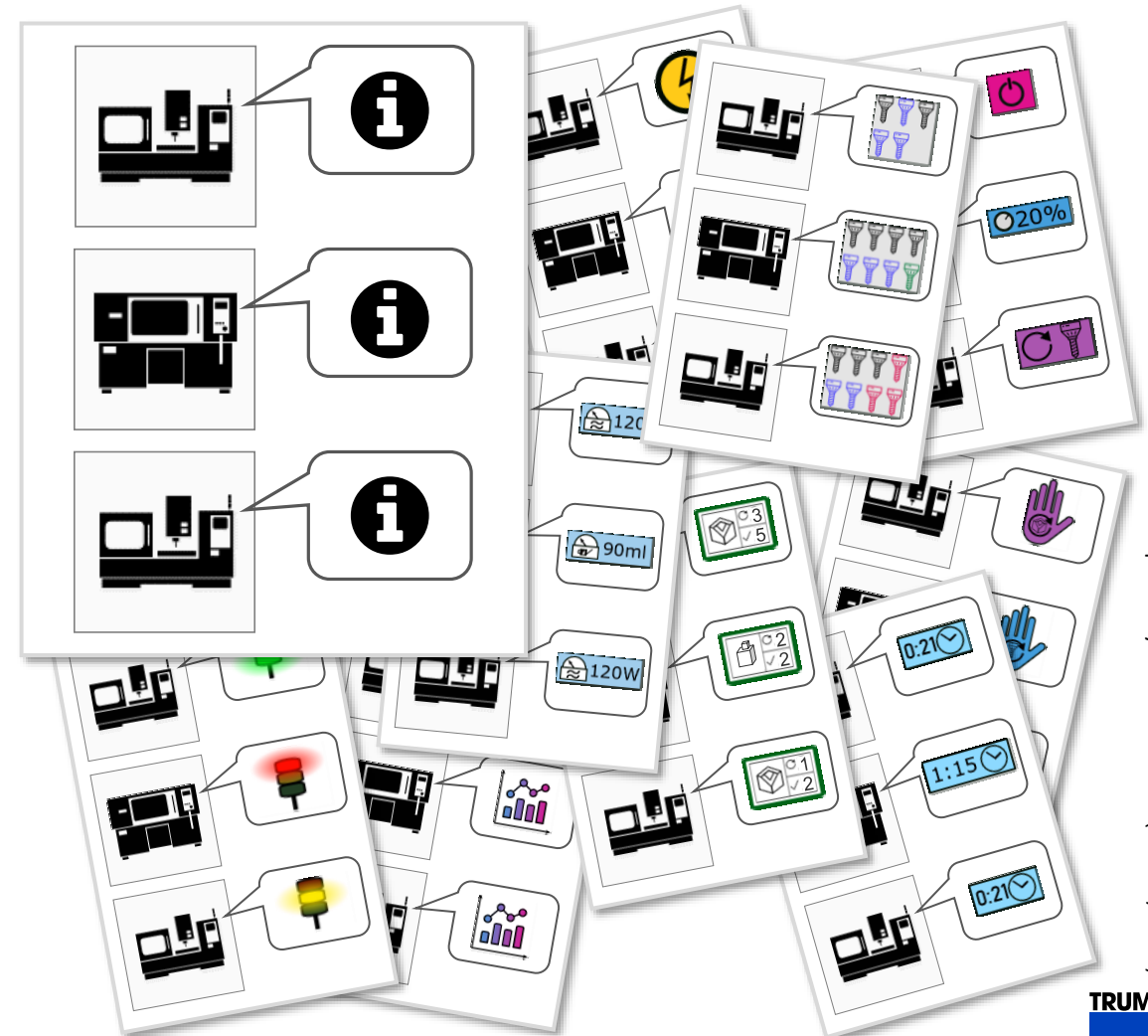


Source: KickOff JWG umati (VDW/Kon14.0/umati); *) <https://vdw.de/umati-iwg-kickoff>

umati Use Cases



- 1 Identify machines of different manufacturers
- 2 Overview if production is running
- 3 Overview of parts in a job
- 4 Overview of runtimes for a job
- 5 Overview of machine tool state
- 6 Overview of upcoming manual activities
- 7 Overview of errors and warnings
- 8 Providing information for KPI calculations
- 9 Providing data for media and energy usage statistics
- 10 Providing an overview of tool data



Source: World Interoperability Conference 2019 (Kon14.0/umati)

How can I benefit from using umati – and what does it cost?



Bildquelle: Fotolia_55123032_M_SergeyNivens

- umati simplifies and reduces the effort to connect machine tools to customer-specific IT systems landscapes
- Human resources get disburdened, projects can be realized faster, cost is reduced
- umati is established as an open, free-to-use standard based on OPC UA
- No specific licensing is required to use the standardized semantics provided by the umati OPC UA Companion Specification to configure an OPC UA servers within one's own product
- Licensing will be required if software components specifically developed for umati are to be used
- Utilizing the brand „umati“ will be tied to certification and qualification of the implemented interface, additional charges may apply

Source: Short introduction to umati (VDW/Kon14.0)

Showcase participants

70 companies 110 machines 28 software solutions 10 countries



Source: Meet the Experts (EMO 2019); umati



Want to be part of it?



If you are interested in

- getting involved in the OPC Joint Working Group
- taking part in the next demonstration

please register by emailing to info@umati.info



Quelle: Kurzvorstellung umati (VDW/Kon14.0)



Additional Information

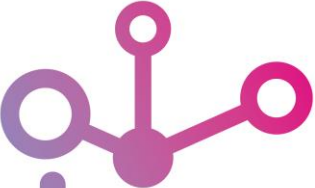
Andreas Wohlfeld
TRUMPF Werkzeugmaschinen GmbH + Co. KG
andreas.wohlfeld@trumpf.com

www.umati.info

info@umati.info

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umati
universal
machine tool
interface