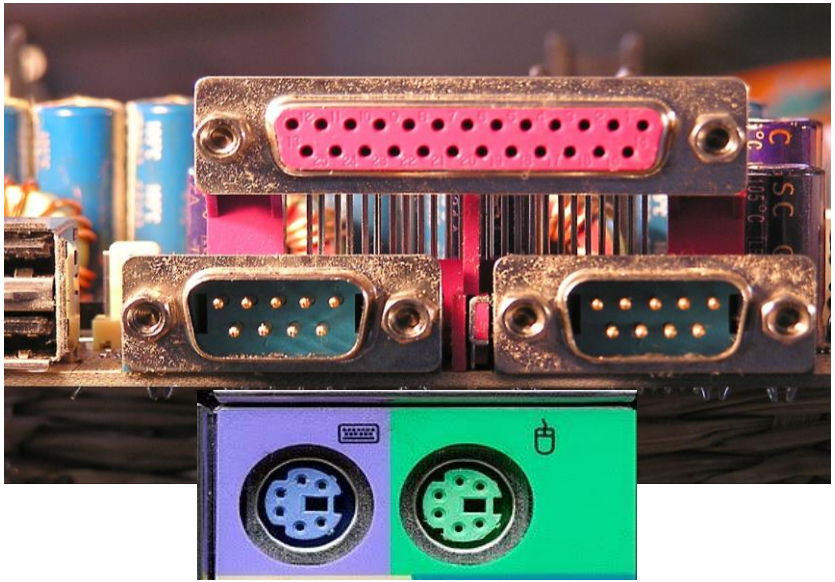
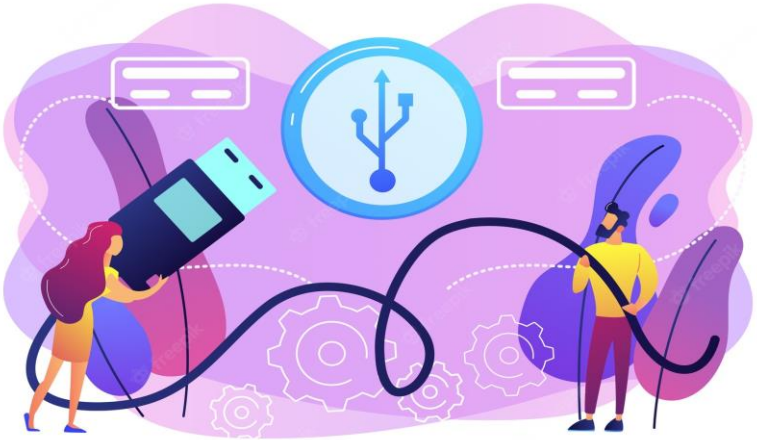
Module Type Package
Plug and Operate for Process Industries

Status and Roadmap

June 11th, 2024 – Dr. Mathias Maurmaier

The beginning of a revolution in IT





Plug & …Voilà

→ **MTP is the answer for OT!**
→ But what about versions and **interoperability**?

MTP – flexible production and package unit integration

MTP as beginning of a revolution in OT

Reducing time to market

Decreasing investment risks

Improving engineering efficiency

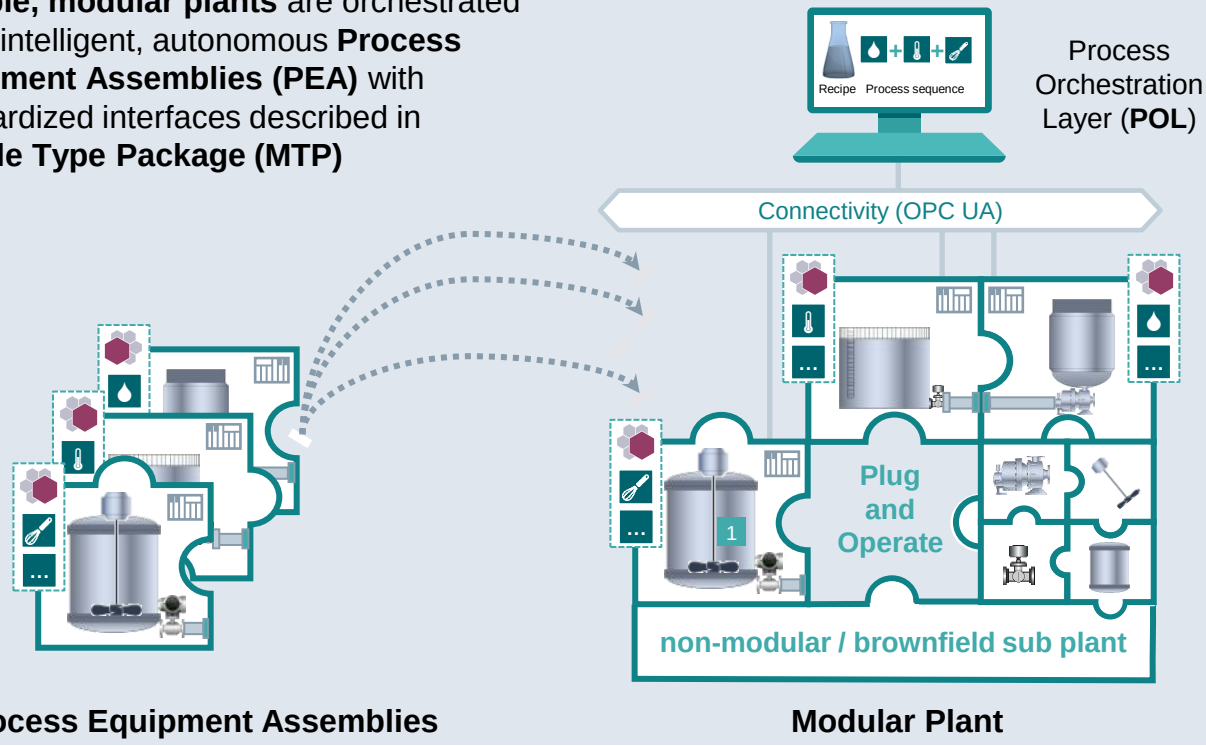
Increasing flexibility of production

MTP as driver for **flexible production** and **package unit integration**
Core concepts: **Standardized interfaces** and **application-level description**

Module Type Package (MTP)

MTP is a standardized, non-proprietary, application-level description of autonomous Process Equipment Assemblies

Flexible, modular plants are orchestrated out of intelligent, autonomous **Process Equipment Assemblies (PEA)** with standardized interfaces described in **Module Type Package (MTP)**



MTP as driver for **flexible production** and **package unit integration**
MTP is spreading fast to many industries

Flexible Production
- Adaptability
- Time to market

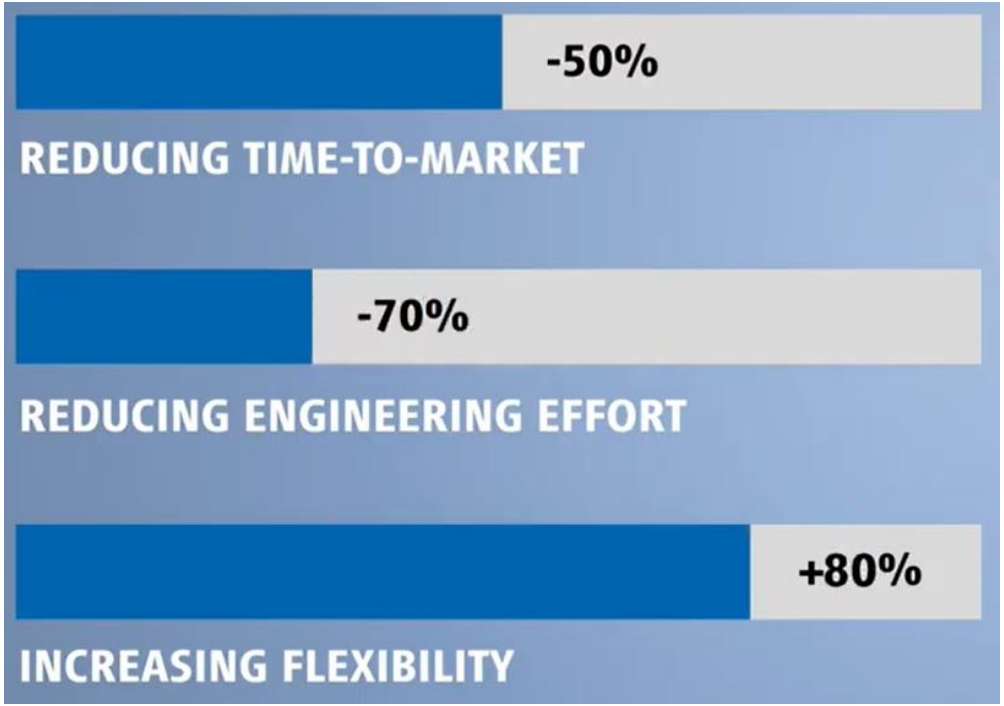
Package Unit Integration
- Engineering efficiency
- Time to market

Manufacturing / Intralogistics | **Pharma** | **Food & Beverage** | **Chemicals** | **Marines** | **Water & Waste Water, Hydrogen**

Focus on
- Functional Orchestration
- Scheduling

Focus on
- HMI-Integration
- Alarming
- Diagnostics

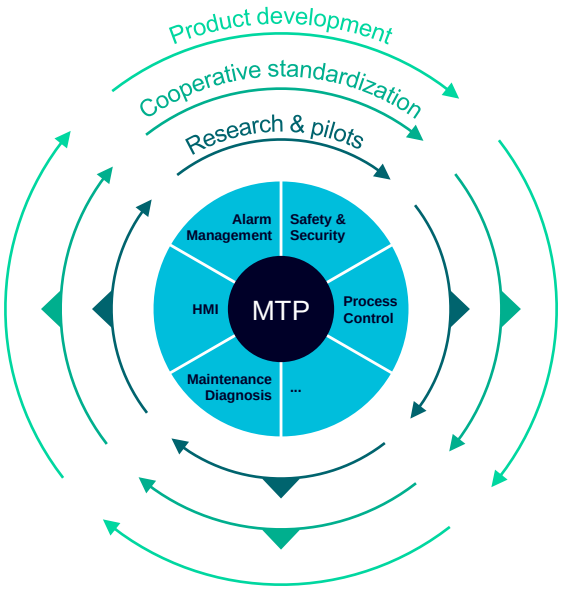
Orchestrate, Plug & Operate
Benefits achieved in first pilot projects



Source: ZVEI, 2022

Modular automation with the MTP standard VDI/VDE/NAMUR 2658

There are many different, partially inconsistent versions.

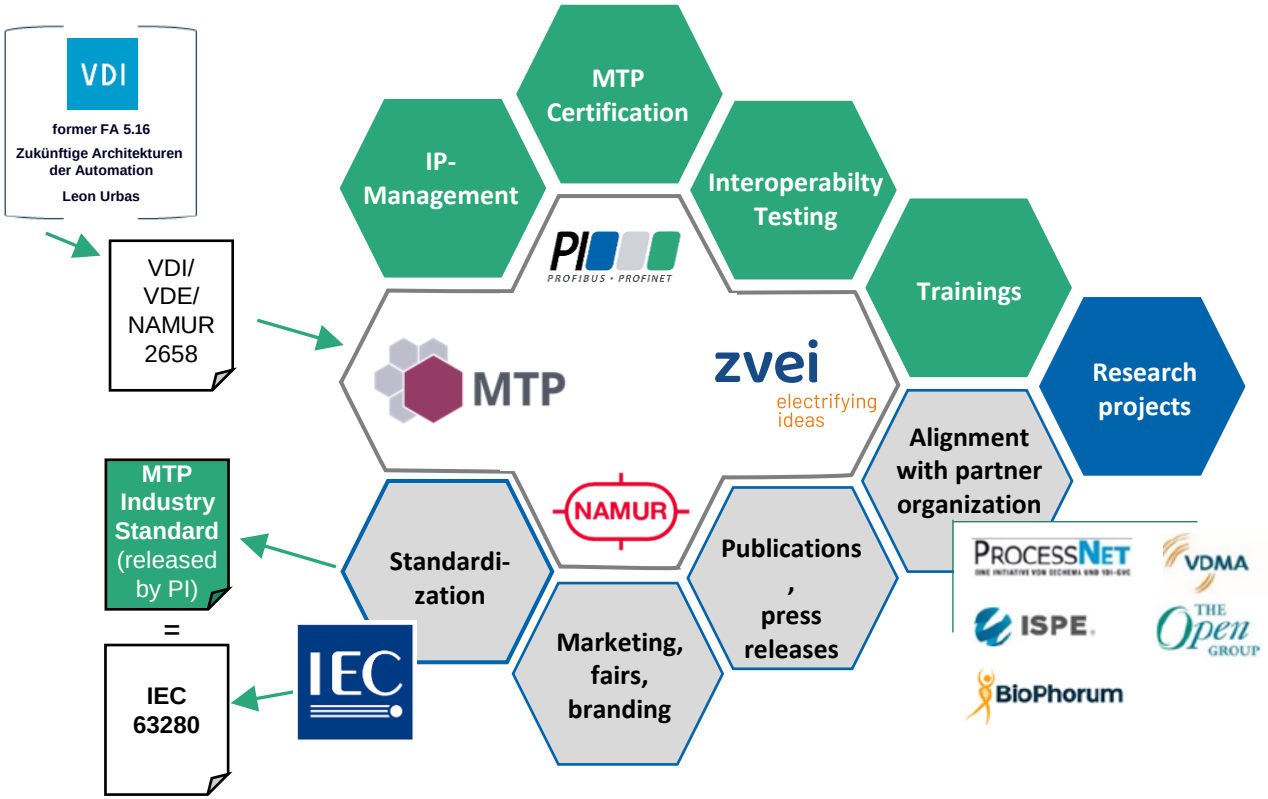


VDI/VDE/NAMUR 2658		Version 1.0			Version 1.1				
Part	Title	CP	PD	PR	CP	PD	PR	Current situation	Products
1	Basic Concept							Different parts of the MTP standard are available as release, as public draft or already as improved draft.	✓
2	HMI – Concept								✓
3	HMI – Interfaces								✓
4	Process Control								✓
5	Runtime – Concept								✓
5.1	Runtime – OPC UA								✓
6	Alarm Mgmt. – Concept							Only concepts for alarming in modular plants have been released as public draft.	(✓)
7	Alarm Mgmt. – Modelling								(✓)
7.1	Alarm Mgmt. – OPC UA								
8	Safety – Concept								
9	Safety – Interfaces								
10	Diag./Maint. – PEA[1]		(NE184)						(✓)
11	Diag./Maint. – Plant								
12	PEA Qualification		(NE185)						(✓)
Requirements for the POL			(NE187)						✓

Projects with products from multiple vendors have to ensure that the products fit together!

MTP – flexible production and package unit integration

NAMUR, ZVEI, and PI combine their potential to make MTP a successful, international industry standard



Principles of cooperation

- All members of **NAMUR, ZVEI, and PI** can get engaged in the committee and have access to documents.
- PI owns all documents and review comments of VDI/VDE/NAMUR 2658
- IP rights concerning the MTP standard owned by any partner must be granted to all other partners.
- Liaison with IEC
- Conformance tests based on accredited test labs
- Close alignment with further industry organizations

MTP – Interdisciplinary cooperation between machine builders, plant integrators/owners and system suppliers is one key to success

Joint Working Groups
NAMUR, ZVEI, and PI joint their forces

MTP Industry Standard VDI/VDE 2658 → IEC TC 65E WG 14 (Convenor: Benjamin Martinez, Mathias Maurmaier) → IEC 63280

OpenGroup	BPOG	ISPE	NAMUR	ZVEI	PI	VDI	VDMA
NAMUR, ZVEI, OpenGroup Exchange Team	BPOG Techn.	Plug & Produce	AK Modulare Automation C. Oro Saavedra (NAMUR), F. Seibl (ZVEI)		Committee MTP	VDI 2776 F. Stenger– Evonik	MTP in marines MTP in Dairy OPC UA for machinery
			MTP SteCo (NAMUR, ZVEI, PI)				

- ✓ Joint MTP Steering Committee
  - NAMUR: Christine Oro Saavedra, Michael Pelz
  - ZVEI: Felix Seibl, Axel Haller
  - PNO: Peter Wenzel, Xaver Schmidt
- ✓ Committee MTP to organize all working groups lead by Mathias Maurmaier (Siemens)
- ✓ Joint Working Groups of NAMUR, ZVEI, PI
  - JWG MTP Quality: Stephan Hensel (Semodia)
  - JWG MTP Core Specifications: Mathias Maurmaier (Siemens)
  - JWG MTP Runtime Interoperability: Oleg Makarov (Phoenix)
- ✓ Liaison of PI and IEC with new convenors (Benjamin Martinez, Mathias Maurmaier)

JWG MTP Quality
S. Hensel – Semodia

JWG – joint working group of PI, NAMUR, ZVEI

JWG Core Specifications
M. Maurmaier – Siemens

Sub-WG Alarming
T. Tauchnitz

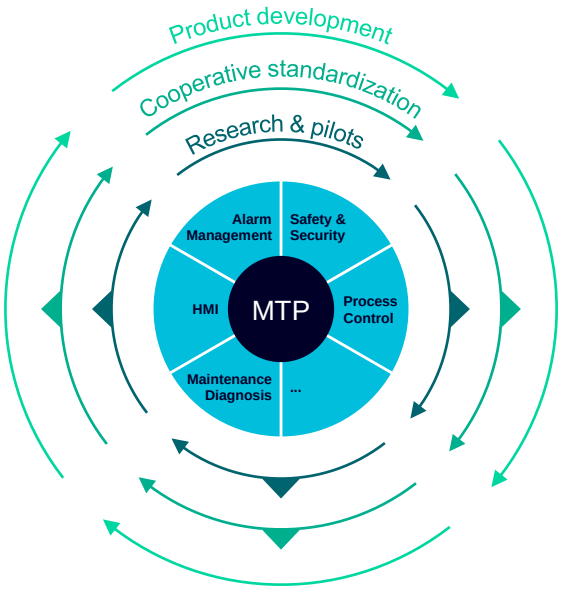
JWG Runtime Interoperability
O. Makarov – Phoenix

WG MTP Marketing
M. Maurmaier Siemens

Committee MTP
M. Maurmaier – Siemens

Modular automation with the MTP standard VDI/VDE/NAMUR 2658

Highest priority: Release of MTP 2.0.0 as consistent specification!



VDI/VDE/NAMUR 2658		Version 1.0			Version 1.1				Products
Part	Title	CP	PD	PR	CP	PD	PR	Roadmap in NAMUR / PI	
1	Basic Concept							**V2.0.0 as NAMUR/ZVEI/PI standard including basic alarming in Q4/2024**	✓
2	HMI – Concept								✓
3	HMI – Interfaces								✓
4	Process Control								✓
5	Runtime – Concept								✓
5.1	Runtime – OPC UA								✓
6	Alarm Mgmt. – Concept								(✓)
7	Alarm Mgmt. – Modelling							V2.0.0 will include basic and managed alarms via OPC UA	(✓)
7.1	Alarm Mgmt. – OPC UA								
8	Safety – Concept								
9	Safety – Interfaces								
10	Diag./Maint. – PEA[1]		(NE184)						(✓)
11	Diag./Maint. – Plant								
12	PEA Qualification		(NE185)						(✓)
Requirements for the POL			(NE187)						✓

- In fall 2024, NAMUR, ZVEI, and PI will release **MTP V2.0.0** as new consistent set of documents!

Status of MTP Specifications in NAMUR, ZVEI, and PI
MTP 2.0.0 will be released in Q4/2024

Part	Titel	JWG	Status	Member Review	Planned Release
-1	General concept	Core Specifications	JWG draft	06-09/2024	Q4/2024
-2	Human Machine Interface	Core Specifications	JWG draft	06-09/2024	Q4/2024
-3	Data Objects	Core Specifications	JWG review	07-10/2024	Q4/2024
-4	Service-based process control	Core Specifications	15 editorial issues	07-10/2024	Q4/2024
-5	Runtime aspects	Runtime Interoperabilty	JWG draft	07-10/2024	Q4/2024
-5.1	Runtime aspects – OPC UA	Runtime Interoperabilty	JWG draft	07-10/2024	Q4/2024
-6/7	Alarming Basic Profile Alarming ManagedAlarms via OPC UA (DA)	Core Specifications	JWG review	07-10/2024	Q4/2024

- Member Review for MTP Specification part 1 has been kicked off on June 12, 2024
- After the initial release, a release of the MTP Specification is planned every 2 years.

New aspects in MTP Specification 2024: MTP V2.0.0

New features:

- Profiles:
  Basis for industry specific features
- Custom svg-graphics for process displays in AttachmentSet of MTP
- Addition of two DataAssemblies for 3-way valve: TriPosVlv, MonTriPosVlv
- Addition of optional profile for custom datatypes and arrays for service parameters
- ManagedAlarms profile for PEA hosted alarms transmitted via OPC UA (DA)

Clarifications:

- Terms and definitions: alignment with IEC terms
- Modelling of process displays: Coordinate-based and connection-based
- eClass format within MTP
- Flutter detection
- Operation mode and source mode for part 3 (control module level) and part 4 elements (service level)
- Apply mechanism for service and configuration parameters
- OPC UA server profiles for MTP

ISA 88 alignment and Best Practice Papers

NAMUR, ISA, and PI work on a position paper to align MTP and ISA 88:

→ It is possible to implement full ISA 88 compliant PEAs with MTP.

→ Best Practice Papaer will show, how to achieve full ISA 88 compliance with MTP

Further Best Practice Papers planned

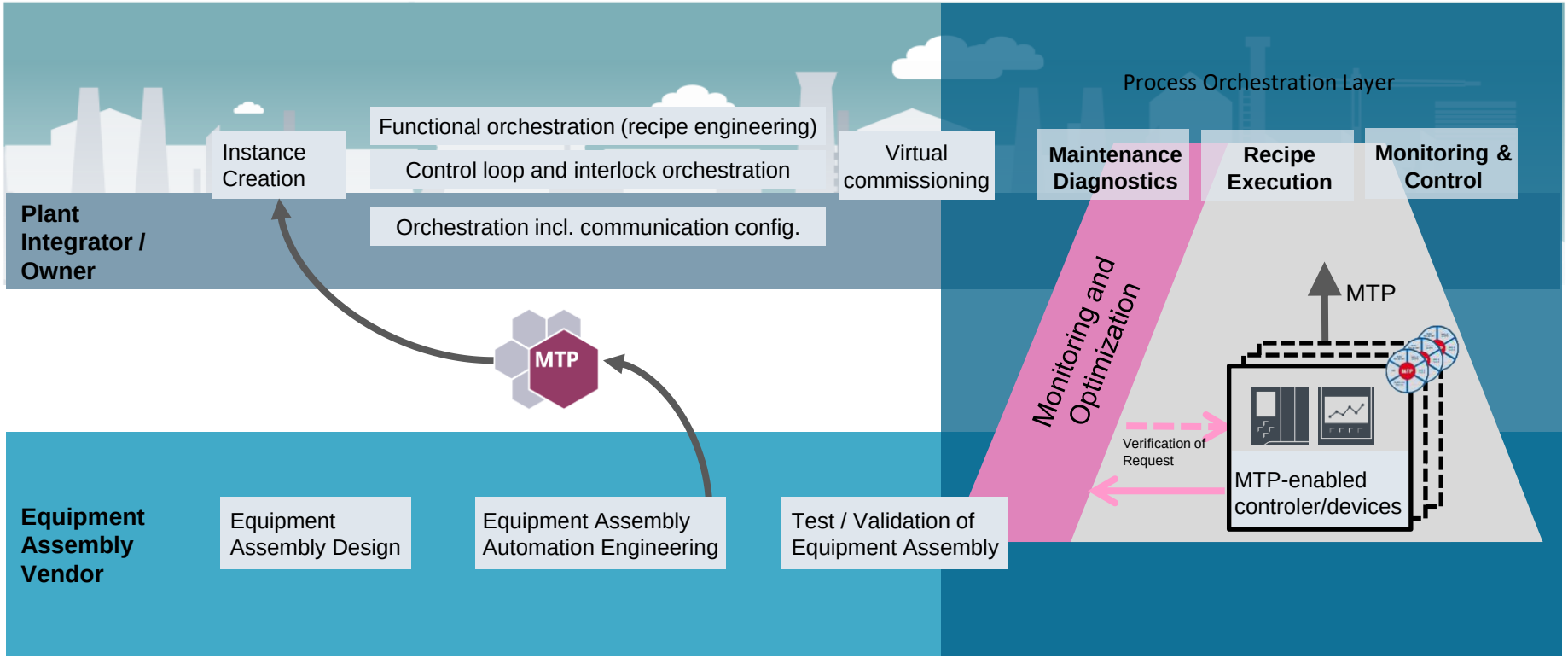
→ HMI design with MTP

→ How to use MTP concepts for use cases with ressource constraints

- In 2024, **MTP V2.0.0** and Best Practice Papers will boost market adoption of MTP.
- In 2025, **Conformance Tests** will boost interoperability

MTP – flexible production and package unit integration

MTP introduces a clear **separation of responsability** between Plant Owner and Equipment Assembly vendors: Products will be targeted to either one

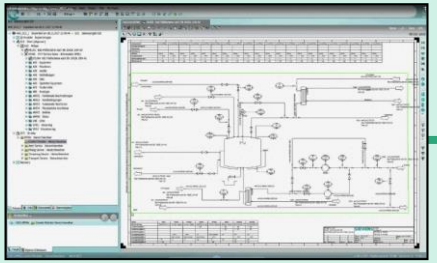


How to built an MTP compliant Process Equipment Assembly

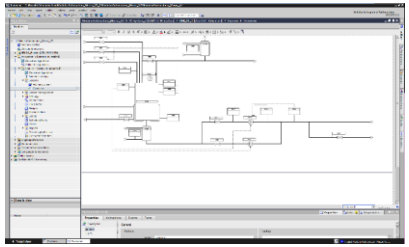
Equipment Assembly design
(R&I, service specification)

Equipment Assembly automation engineering
(HW config, interlocks, service implementation, HMI screens)

Test and validation
(test and documentation)



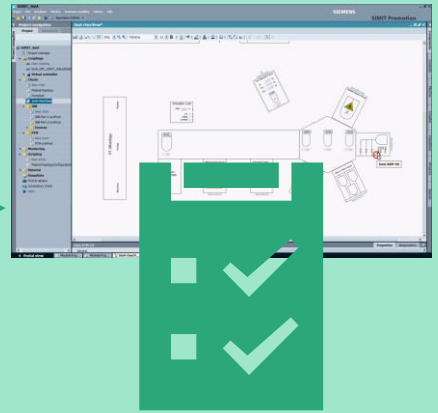
Specification of the concrete MTP interface of the Equipment Assembly Type using the building blocks defined in VDI/VDE/NAMUR 2658



MTP Library with building blocks for MTP conformant interfaces

MTP enabled controller, i.e. controller with OPC UA server

Implementation of the automation software including the logic and control loops

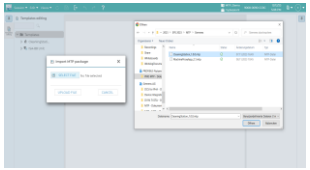


Goal: Provide pretested, autonomous equipment assemblies, which can be orchestrated or easily integrated

PEA Orchestration
Import, Orchestrate, Validate, Operate

MTP

MTP-Import

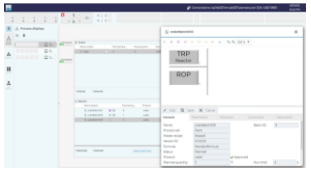


- **Import of MTP into POL system and get all tags, process displays, alarms as well as interfaces to functions.**

Instantiation

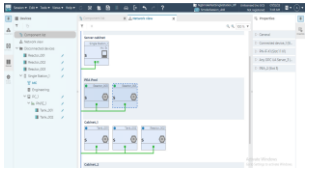
- **Instantiate concrete PEA in concrete plant**

Service Orchestration



- **Design sequence of MTP service calls including setpoints**

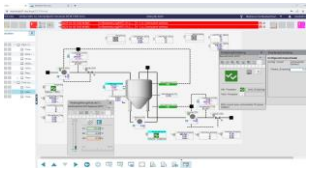
Network Topology



- **Configure communi-cation and security settings**

Validate

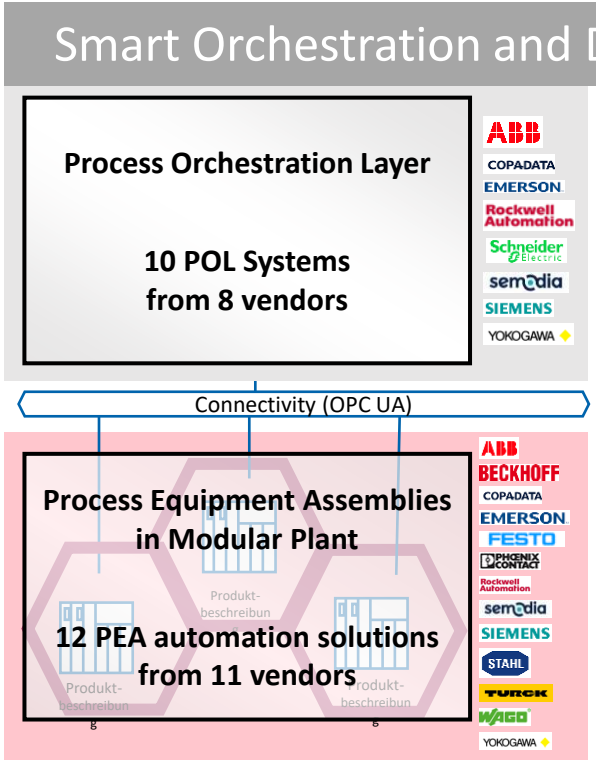
Operation

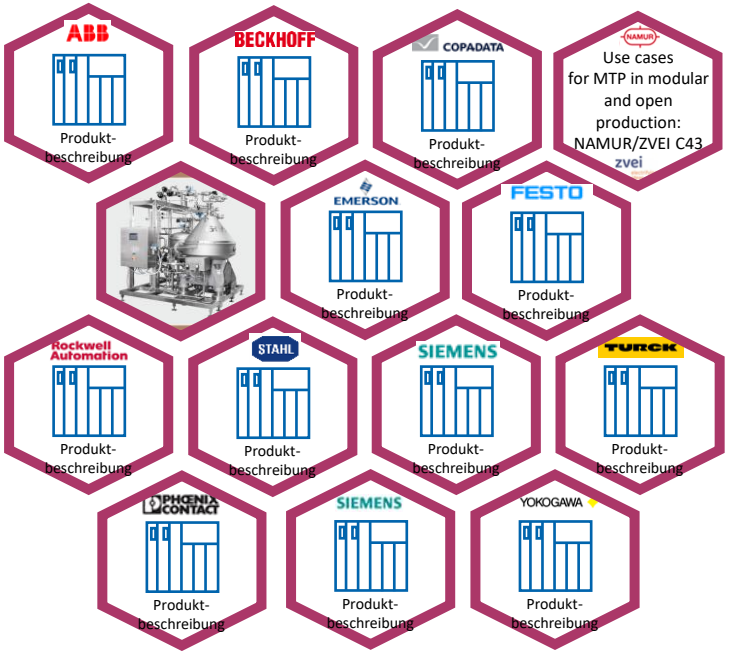


- **Execute the configured service sequences**
- Monitor and operate the plant via process displays
- Alarm handling
- Archive and analyze data, trending
- Generate reports

New MTP Multi-vendor demo
Visit us on PNO Booth, hall 11.1

Smart Orchestration and Digitalization of Production Plants





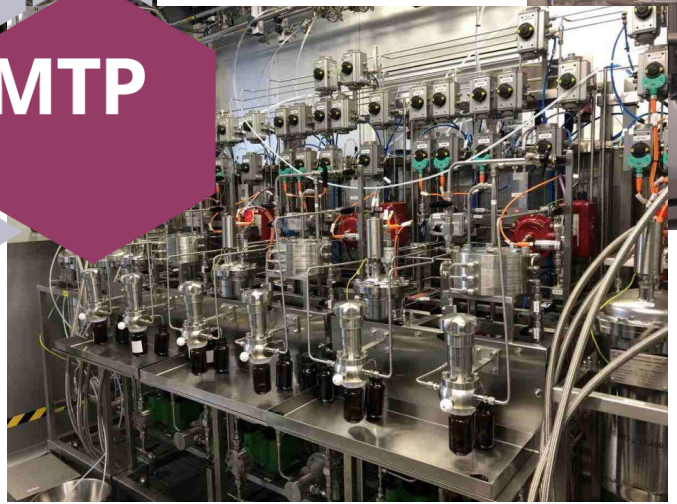
MTP – flexible production and package unit integration

MTP at the doorstep to market entry
Visit the MTP demo and start your MTP projects, now!

20+
PEA vendors involved

MTP

25+
MTP products available



20+
automation suppliers involved

50+
PoC projects

Contact

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Siemens AG
Digital Industries
Process Automation

mathias.maurmaier@siemens.com

New Convenors of TC65E WG14

Benjamin Martinez

- Started in Process Automation Business in 2013 :
  PLCs testing (EMC, Mechanical, Basic Safety, ATEX,…), programing (IEC 61131) and Conformity (national and market specifics)
- Innovation Center since 2021, involvement in Standardization
  Smart Manufacturing and Digital Twin related topics, Chair of national mirror committee UF 65, contribution in Consortia for collaborative projects

Mathias Maurmaier

- Made his PhD in model-driven development for automation systems at University of Stuttgart, Germany
- Started in Process Automation Business in 2010 in Technology and Innovation department:
  Device Integration (FDI) and Modular Automation (MTP), involved in several standardization working groups
- System Owner Modular Automation at Siemens AG, Karlsruhe, Germany and thus responsible for MTP features in SIMATIC PCS 7 and SIMATIC PCS neo.
- Lead of Committee MTP in NAMUR/ZVEI/PI

MTP as IEC 63280:
Kickoff of IEC TC65E WG 14 on 14th Feb 2024

- Kickoff 14th Feb 2024 with 11 (out of 19) members from 5 NCs
- New Convenors: Benjamin Martinez (Schneider, France), Mathias Maurmaier (Siemens, Germany) approved

Consensus:

- Start with MTP Specification part 1 to be released as IEC 63280-1

NP	Committee Draft	CDV	FDIS	IS
2024.03.29	2024.12.20	2025.08.20	2026.02.25	2026.05.19

→ NP to be submitted from German NC (DKE 941)