"

Today, companies need to be able to respond to volatile demand, uncertain supply and constrained capacity. But as we look beyond the pandemic, they must also be able to respond to demanding customers who will look for individualized and sustainable products. If anything, this volatility has highlighted the need for digital transformation and industry 4.0."

*Forbes*, 2020

# What are the drivers?

**smaller volumes**
- raising variability of products with smaller volumes to meet individualization and customization

**higher innovation flexibility**
- reduced time to market to react to volatility and ambiguity of the market

**higher location flexibility**
- more sustainable and resilient supply chains in a mega city structured world

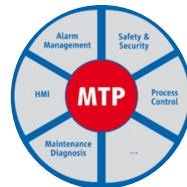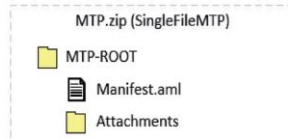**sustainable production**
- responsible ressource aware production

**Manufacturing of the future:
Think smaller, more flexible, more
sustainable, yet cost competitive**

# MT… What?

- Module Type Package

  This standard specifies the general automation concepts of modular equipment for the process industry and provides the basic definitions for the specification of interfaces and information models.

  It is a harmonized format to describe modular production equipment (MTP-File)

- Contains all information to integrate a fully automated module in the Process Control Level

  Communication technology

  Operator interface (HMI)

  Functionalities (Services) and their interfaces

  Interfaces to diagnosis and maintenance information

MTP.zip (SingleFileMTP)

📁 MTP-ROOT

📄 Manifest.aml

📁 Attachments

# MTP Value Journey
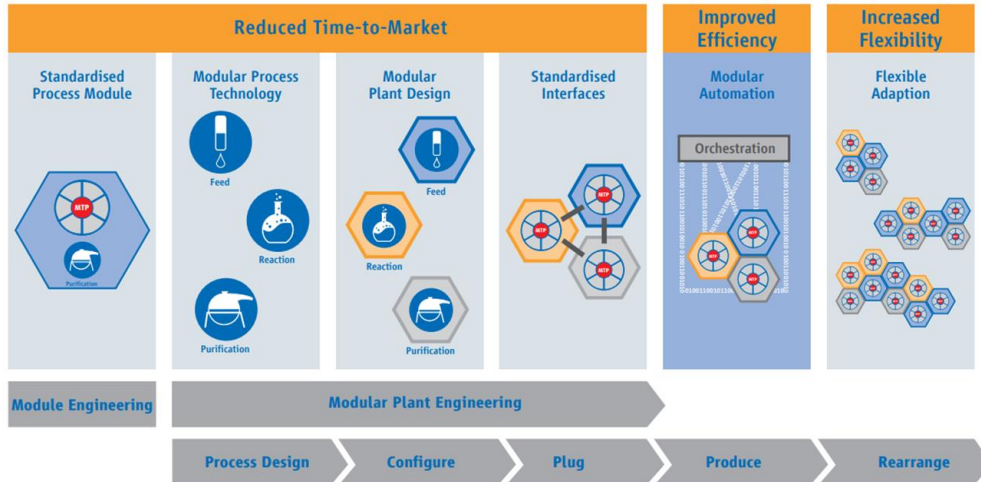


Source: NAMUR / ProcessNet / ZVEI

BECKHOFF  NAPCON  Nortal  OPC  PROSYS OPC  Life Is On Schneider Electric  Semantum  Valmet  Wapice  FINNISH SOCIETY OF AUTOMATION SUOMEN AUTOMAATIOSEURA RY

Public

# NAMUR - End User driven organization
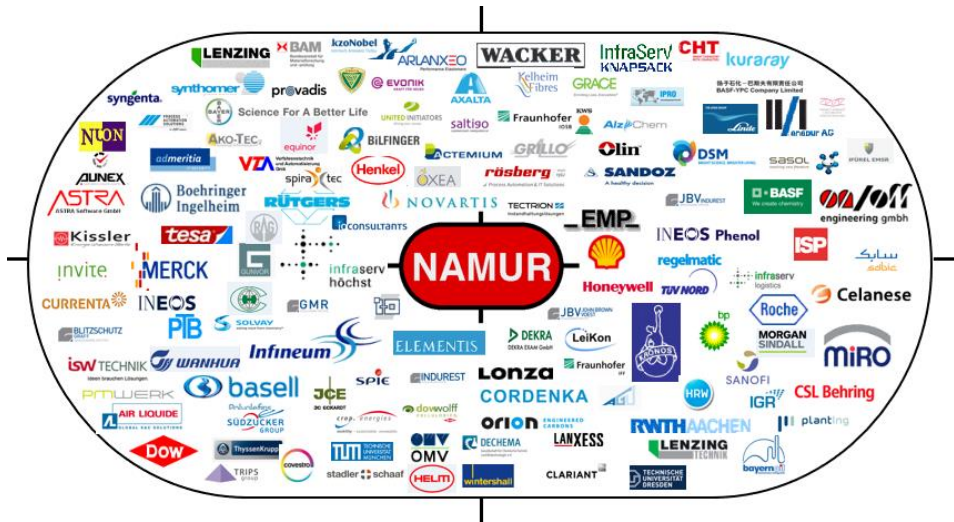
Modular Production

Round Table
Modular Production

THE Open GROUP

BioPhorum

ISPE

**NAMUR** — Heinrich Engelhard

**ZVEI:** Die Elektroindustrie — Felix Seibl

**PROCESSNET** EINE INITIATIVE VON DECHEMA UND VDI-GVC

**VDI**

**VDMA** Verfahrenstechnische Maschinen und Apparate — Frank Wohnsland

AK
Automatisierung modularer Anlagen
Jens Bernshausen

AK
Modulare Automation
Axel Haller

TAK
Modulare Anlagen
Frank Stenger

FB GVC01
Verfahrenstechnische Prozesse
???

FA 5.16
Zukünftige Architekturen der Automation
Leon Urbas

Send members

Send members

Send members and input

Sub-Aks
Working Groups

VDI 2776 / Blatt 1-x
Verfahrenstechnische Anlagen, Modulare Anlagen, Grundlagen

| 1.12.1 Technology | 2.3.1 Process Control | 2.4.1 MES | 2.9.1 HMI | 4.11 Diagn. & Mainten. |

Taskforce
Runtime & Communication

Taskforce
Process Orchestration

Send members and input

VDI 2658 / Blatt 1-12
Automatisierungstechnisches Engineering Modularer Anlagen in der Prozessindustrie

To become
IEC 63280

BECKHOFF   NAPCON   Nortal   OPC FOUNDATION   PROSYS OPC   Life Is On Schneider Electric   Semantum   Valmet   Wapice

FINNISH SOCIETY OF AUTOMATION
SUOMEN AUTOMAATIOSEURA RY

Public

## Standardization VDI/VDE/NAMUR 2658 (GMA 5.16) Status 2021-11

WG: working group, CP: concept paper, CD: committee draft, PD: Public draft, IR: internal release, PR: public release)

https://www.vdi.de/2658

| 2658-X | Title | WG | CP | CD | PD | IR | PR | Comment |
|---|---|---|---|---|---|---|---|---|
| 1 | Basic Concept | | | | ✓ | | ✓ | Released 10-2019 |
| 1:2022 | Basic Concepts Revision | | | | | | | CD released to VDI, PD to be published 02-2022 |
| 2 | HMI Concept | | | | ✓ | | ✓ | Released 11-2019, Erratum to be published 02-2022 |
| 3 | HMI Interfaces | | | | ✓ | | ✓ | Released 09-2020, Erratum to be published 02-2022 |
| 4 | Process Control w Services | | | | ✓ | | | PD released 08-2020, IR released to VDI, PR 02-2022 |
| 4.2 | OPC UA Method Interface | | | | | | | Task Force established |
| 4.3 | Service Relations | | | | | | | Task Force established |
| 4.4 | Cross Communications | | | | | | | *New Work Item Proposal* |
| 5 | Runtime Concept | | | | | | | CD released to VDI |
| 5.1 | Runtime OPC UA | | | | | | | CD WIP final editing round |
| 6 | Alarm Mgmt Concept | | | ✓ | | | | IR WIP, *IR planned for 12-2021* |
| 7 | Alarm Mgmt Models | | | ✓ | | | | PD released 02-2021, *IR planned for 12-2022* |
| 7.1 | Alarm Mgmt OPC UA | | | | | | | CD WIP, *CD planned for 12-2021* |
| 8 | Safety Concept | | | | | | | CP WIP in NAMUR AK 4.5.1, *CD release 02-2022* |
| 9 | Safety Interfaces | | | | | | | Follow up to Sheet 8 in NAMUR AK 4.5.1 |
| 10 | Diag & Maint – PEA | | | | | | | CP WIP in NAMUR AK 4.1.1 |
| 11 | Diag & Maint – Plant | | | | | | | CP WIP in NAMUR AK 4.1.1 |
| 12 | PEA Qualification | | | | | | | CP WIP in NAMUR AK 2.4.1 |
| 14 | MTP Certification Process | | | | | | | *New Work Item Proposal* |

TECHNISCHE UNIVERSITÄT DRESDEN

PROCESS PROCESS CONTROL SYSTEMS SYSTEMS ENGINEERING

GMA FA 5.16 / Prof. L. Urbas
Monthly Status Report MTP Standardization // 16.06.2021

Folie 1

DRESDEN concept

# MTP is built on and relates to many standards
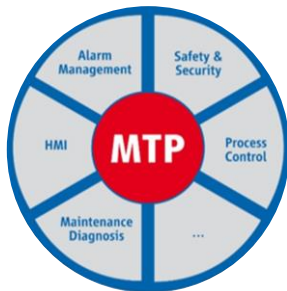
# MTP Plug & Produce Philosophy



*Process Equipment Assembly*

*Process Orchestration System*

Public
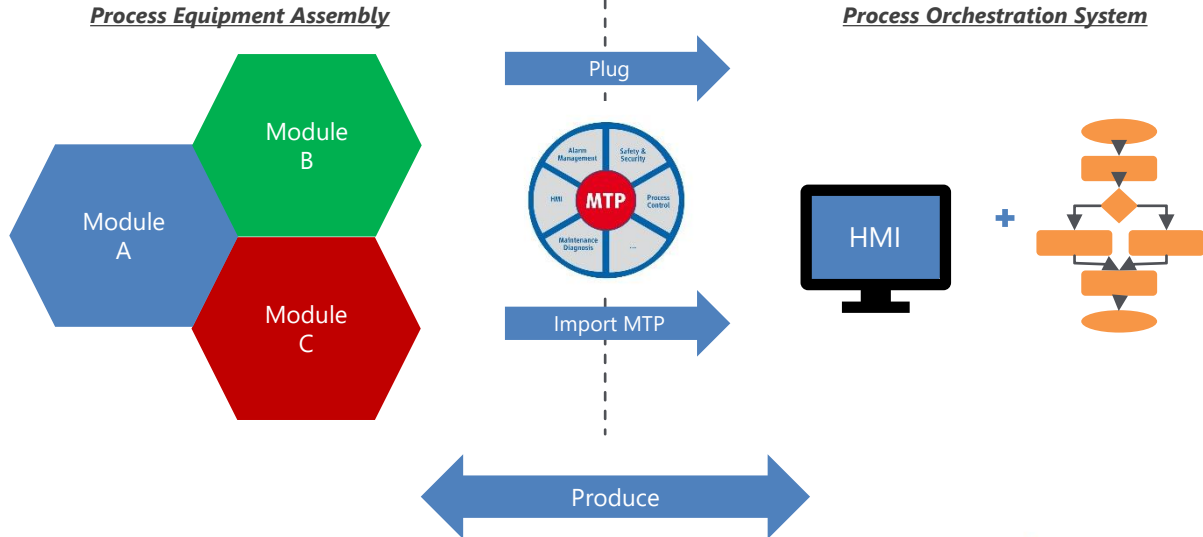
# Where is MTP recognized today



Pharma
LifeScience
Fine Chemicals

Food &
Beverages

Marine

# Functional Interface

- Described in the MTP-Part
- Services, Procedures, Parameters
- Configuration and Variables
- HMI Description

▲ ⁝ ModuleTypePackage
    ▲ **IE** PeaExample {**Class:** ModuleTypePackage **Role:** AutomationMLBaseRole}
        ▷ **IE** Communication {**Class:** CommunicationSet **Role:** AutomationMLBaseRole}
        ▷ **IE** Services {**Class:** ServiceSet **Role:** AutomationMLBaseRole}
        ▷ **IE** ProcessValues {**Class:** ProcessValueSet **Role:** AutomationMLBaseRole}

# Communication Interface

- Described in the Communicaton Class
- OPC-UA Server
- All dynamic MTP data is mapped to OPC

▲ ⁝ ModuleTypePackage
    ▲ **IE** ModuleName {**Class:** ModuleTypePackageEx **Role:** AutomationMLB
        ▲ **IE** CommunicationSet {**Class:** CommunicationSet **Role:** Automatio
            ▲ **IE** SourceList {**Class:** SourceList **Role:** AutomationMLBaseRole}
                ▲ **IE** OPCUAServer {**Class:** OPCUAServer **Role:** AutomationML
                    ⊶ AB001_CloseFbk {**Class:** OPCUAItem }
                    ⊶ AB001_CloseAut {**Class:** OPCUAItem }
                ▷ **IE** BasicServerProfile {**Class:** BasicServerProfile **Role:** Au
                ▷ **IE** StandardServerProfile {**Class:** StandardServerProfile R
                ▷ **IE** ExtendedServerProfile {**Class:** ExtendedServerProfile

## What's Next

- MTP is still an evolving standard

- Today MTP does not leverage all features of OPC-UA

- MTP is not aligned with all potential companion specs

- MTP to become IEC63280

- MTP Services (VDI 2658-4) will be extended by the introduction of OPC-UA Method Calls (Part 4.2)
- MTP Services (VDI 2658-4) will be extended by the introduction of Module-to-Module cross communication (Part 4.4)
- MTP Runtime Concepts (VDI 2658-5) to describe the basic, abstract interface to the POL
- MTP Runtime OPC-UA (VDI 2658-5.1) describes the specific OPC-UA implementation
- MTP Alarms (6,7,7.1) take care of Alarms and exceptions based on OPC-UA A&C
- MTP Safety (VDI 2658-8) will introduce funtional safety based on OPC-UA Safety

# EcoStruxure Automation Expert

Game changing platform independent automation solution

Based on IEC 61499

Public

Life Is On | Schneider Electric

# Proof of Concept

Joint PoC with GEA to demonstrate MTP using IEC 61499

GEA provided the equipment and process description for the PEA

Schneider Electric delivered the full automation Solution

Key takeaways:
MTP for the PEA developed in IEC61499
Reusable, Asset centric, Flexible

EcoStruxure Automation Expert also used for the orchestration
with AVEVA System Platform

Public

# MTP – Services in IEC61499 – EcoStruxure Automation Expert

Public

Life Is On | Schneider Electric
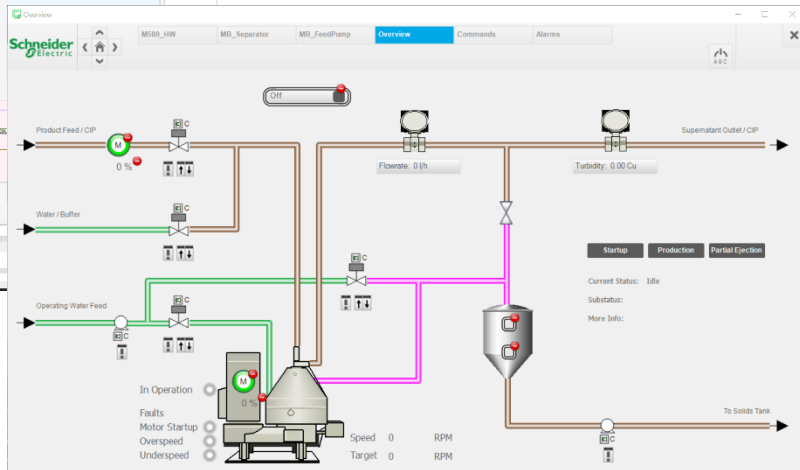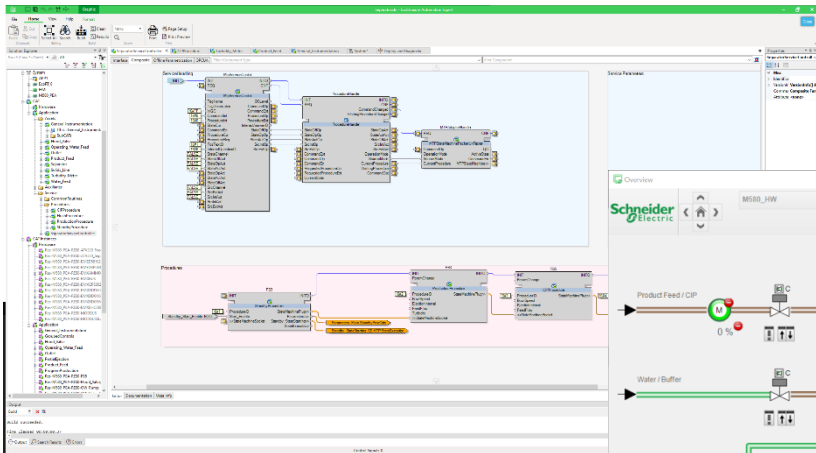
# Visit us at SPS in Nuermberg

The demonstrator will be shown at SPS in Nuermberg



## SPS 2021 (canceled)

Nov. 23rd to 25th

Schneider Electric

Hall 1 . Booth 540



Internet: **https://www.se.com/ww/en/product-range/23643079-ecostruxure%E2%84%A2-automation-expert/**
Universal Automation: **https://universalautomation.com**

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# The world is ready for a new open age of automation

Support standards, express your needs, implement innovation

Life Is On | **Schneider** Electric