

Update on DEXPI Standards

DEXPI 2.0 and its expected impact on process engineering research and development as well as the interplay with process simulation



Speaker introduction

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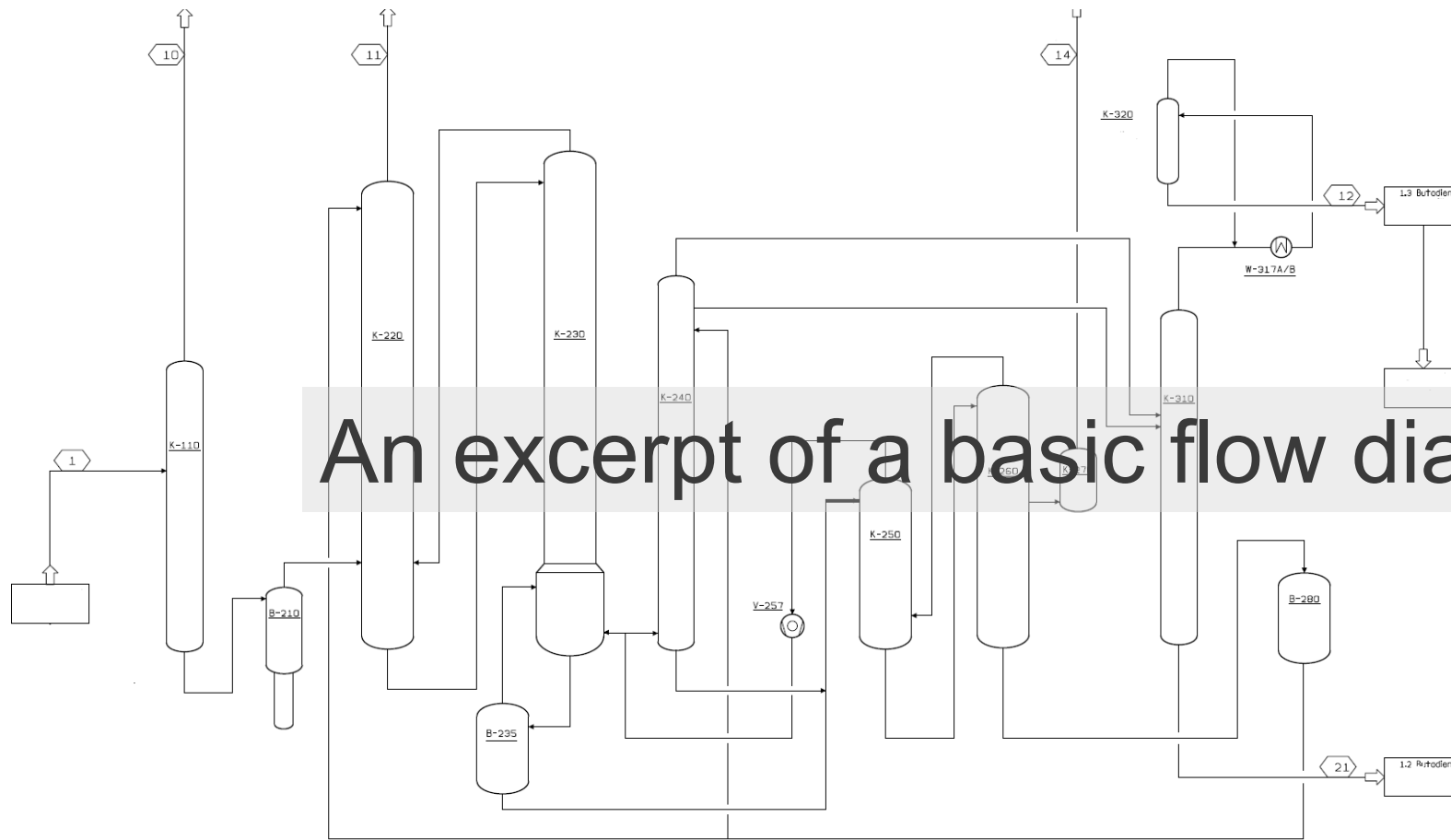


- Involved in CAPE-OPEN since 2013
 - Doctoral Thesis (2019): “Automatized implementation of CAPE-OPEN interfaces - a workflow for equation-based flowsheet modeling”
- Working for Evonik since 2018
- Active as DEXPI Specification lead since 2019

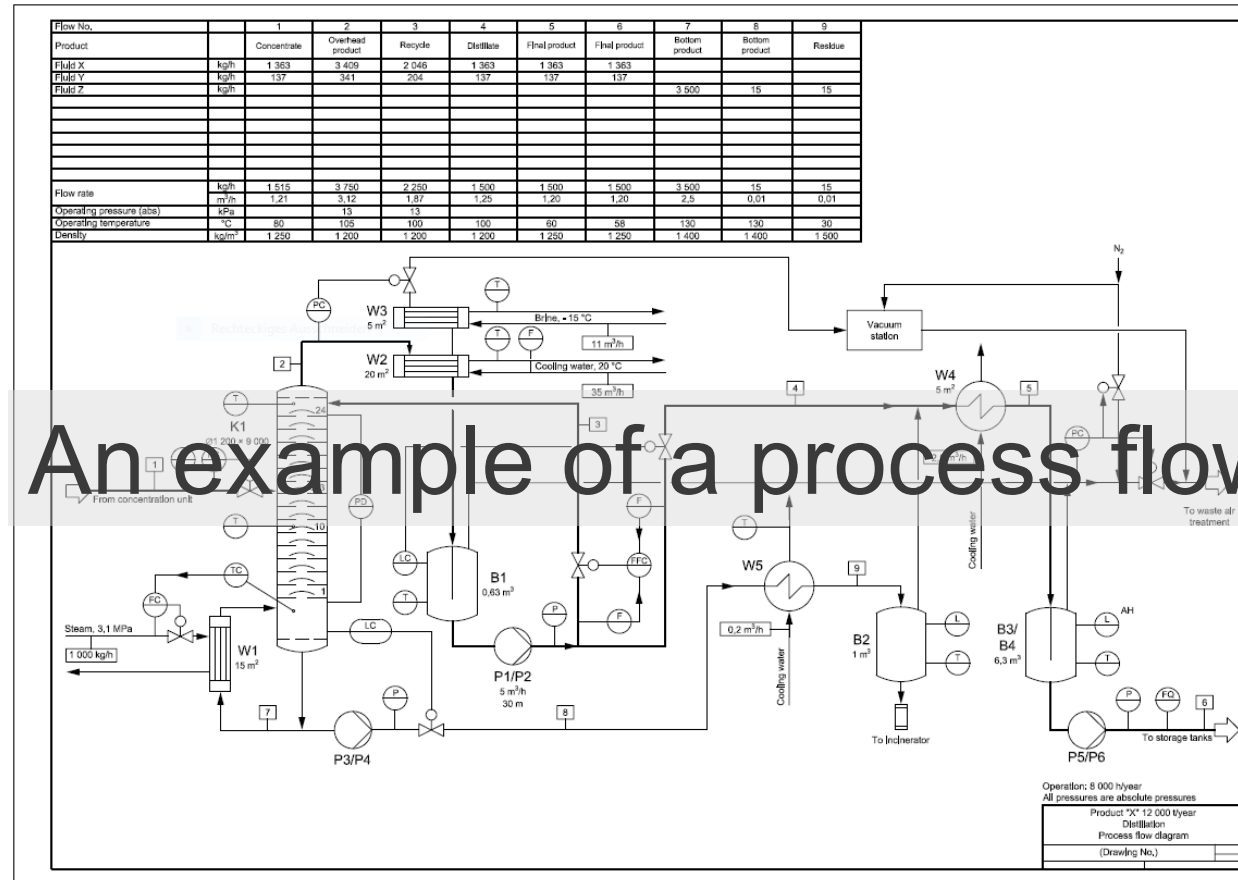
Agenda

- Problem Statement
- The Answer: DEXPI 2.0
- Action

What is this?



And what's this?



The Asset Lifecycle

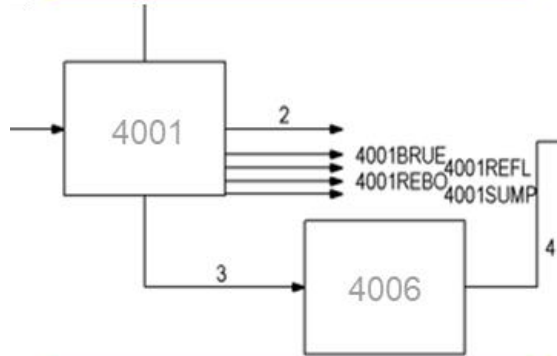
Process simulation is just the beginning...

Functional Requirements

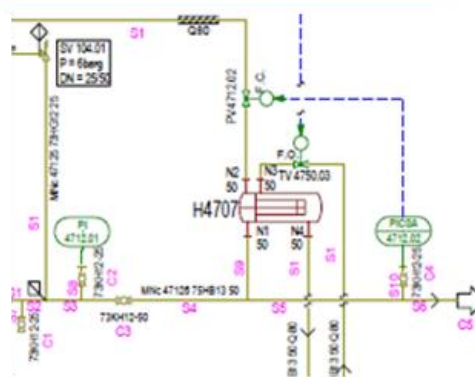
Functional Design

Asset Specification

Asset in Operation



Process Structure



Plant Structure



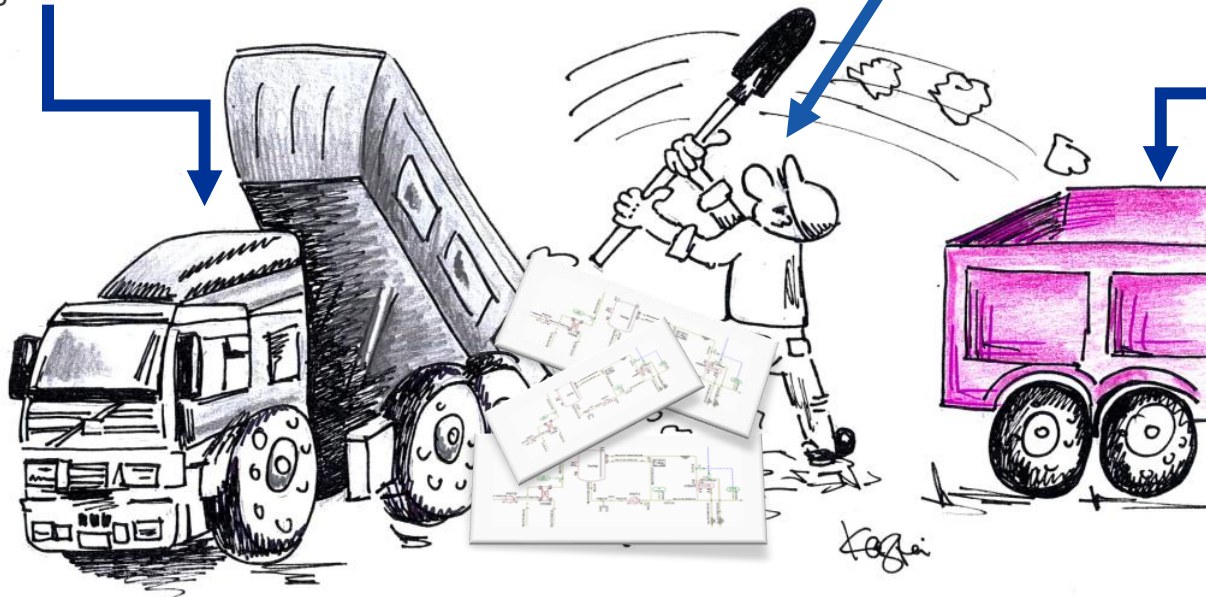
Asset Structure

Problem Statement

Data handover around Process Flow Diagrams and Flowsheet simulation is challenging.

Smart PFD tool*

*Including flowsheet simulation



You

Another smart PFD tool*

*Including flowsheet simulation

Question



How can we possibly get to the point that...

- ... the process structure* can be handed over across tool boundaries in a simple, standardized way?
 - This includes creating a PFD based on a flowsheet simulation, handover of a process simulation, and handover of a PFD.
- ... stream tables of PFDs can be auto-generated by linking it to simulation data in a standardized way?
- ... thermodynamic configuration information can be included in a PFD handover?

*process structure = unit operations + streams + connectivity (=topology)

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The Answer

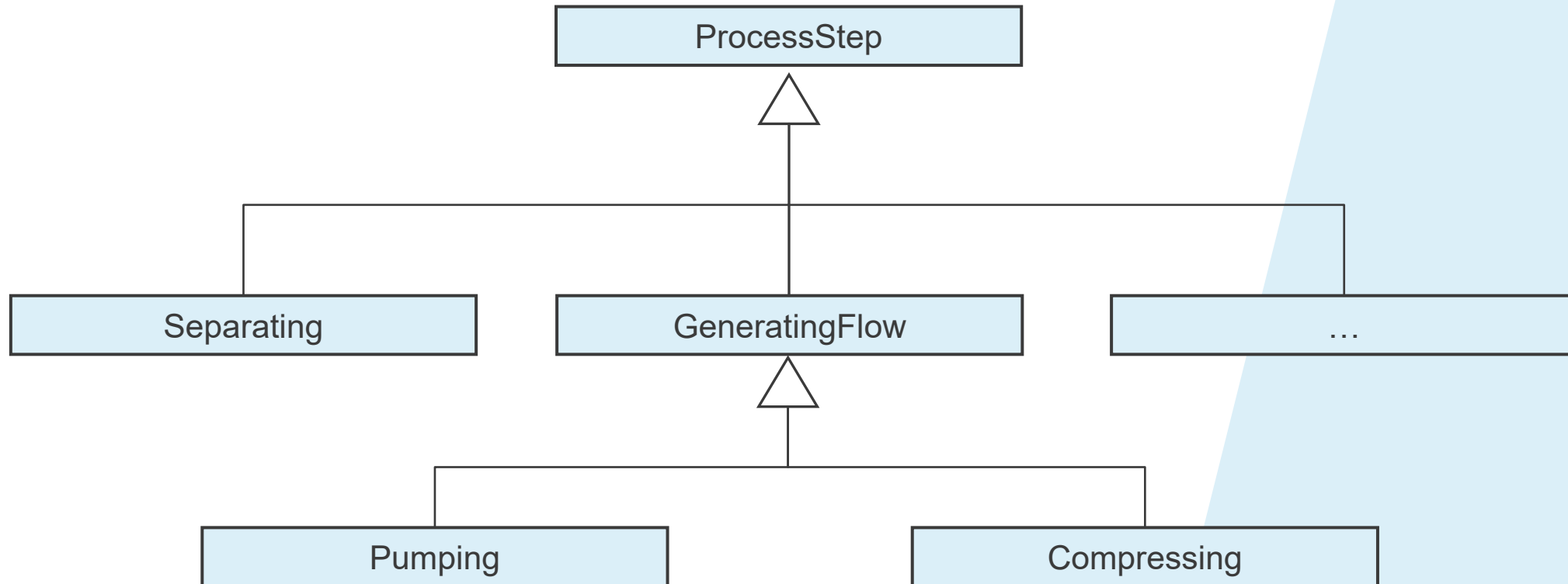


DEXPI 2.0 addresses the process information handover challenge.

- Research and development benefit from an open, standardized information format
 - Standardized file format (DEXPI XML) valuable for scientific exchange
 - Type library allows for comparability, extension, integration of research
- DEXPI 2.0 (+CAPE-OPEN) brings process simulation closer to the engineering processes
 - Exchange between flowsheet simulation and Process Flow Diagrams must cover the topology, the taxonomy and the stream tables

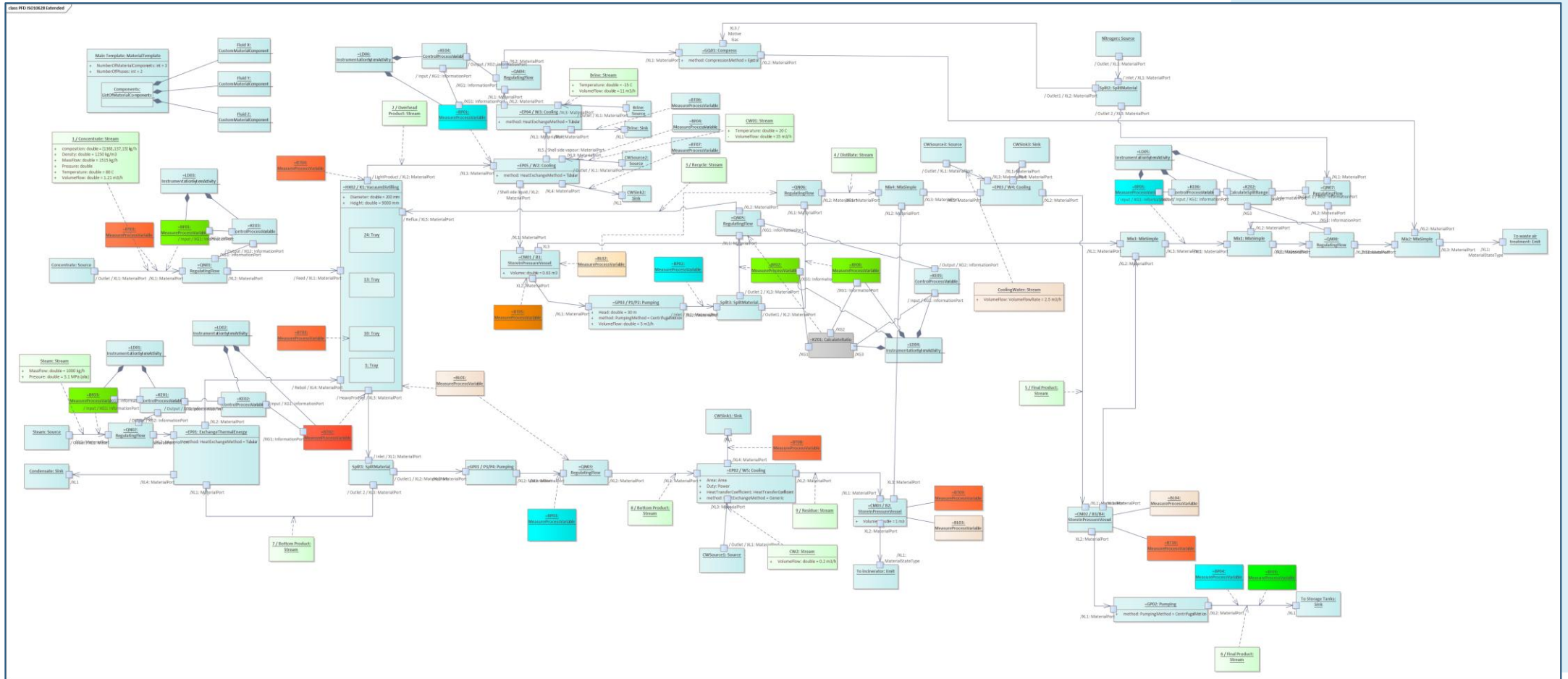
Reason 1

DEXPI 2.0 delivers a taxonomy of process steps



Reason 2

DEXPI 2.0 allows for reflecting the process topology



Reason 3

DEXPI XML is a flexible serialization format

Principles

- XML (decision DEXPI group, approved by board)
- working title “DEXPI XML”
- key requirements
 - simple (based on very few basic rules)
 - easily readable for humans
 - future-proof
- suitable to transport both
 - the **information models** (“the specifications”, simple alternative to XMI)
 - the **actual data** (e.g., an actual P&ID or an actual PFD; simple replacement for Proteus in case of P&ID)

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Action 1

- Spread the word: DEXPI (2.0) exists!
- Make yourself familiar with the standard
 - Join the DEXPI 2.0 release event in November 2025
 - Join DEXPI Days in January 2026
 - Check Publications and manual
- Promote the use of digital, standardized Process Diagram information via DEXPI
 - In research and development
 - In academia and industry
- Consider contributing with your expertise to the creation of the “DEXPI Process Type Standard Library” (DEXPI roadmap item for 2026)

Action 2

- COLaN:
 - Let's set up a collaboration agreement for the purpose of demonstrating and publishing the added digitalization potential of a combined CAPE-OPEN and DEXPI implementation
 - Possible points to discuss/address:
 - Classification of UOs in CAPE-OPEN using DEXPI Process taxonomy
 - Demoing the handover of a simulation flowsheet as a PFD
 - Publishing a research article about 'simulation flowsheet handover'
 - Investigation of a CAPE-OPEN flowsheet manipulation interface

Dates

And other topics



Event Dates

- DEXPI 2.0 Release Events (virtual)
 - Opt 1: 25th of November and
 - Opt 2: 27th of November
 - Remark1: The meetings have the same agenda - no need to join both.
 - Remark2: The links/registration to the meetings still need to be provided.
- DEXPI Days (face to face)
 - 20th – 22nd of January 2026
 - Info including registration link: <https://dexpi.org/event/dexpi-days-1-0/>
 - Four sequential sessions:
 - Innovation, PIDMIC, Bizz Talks, Tech Talks