OPC UA

Verleden, heden en toekomst

Overzicht

- Historie OPC UA
- Wat is OPC UA
- Toepassingen OPC UA

Historie OPC UA

Historie

Overzicht

Microsoft dominate the manufacturing application landscape (COM and DCOM).	1990s	
	1995	Automation vendors form a taskforce OPC. OLE for Process Control. OLE stands for Object Linking and Embedding is based on COM/DCOM.
First release of OPC DA.	1996	
	1998	OPC Foundation begins converting to webservices.
OPC Alarms & Events released	1999	
	2001	OPC Historical Data Access, Batch and security are released.
OPC Complex Data, Data eXchange and XML-DA are released.	2003	
	2004	OPC commands released.
OPC UA version 1.0 released.	2006	
	2007	OPC Certification Program and test labs
OPC UA version 1.01 released.	2009	
	2010	Embedded OPC UA devices released
IEC 62541 is released.	2012	
	2013	OPC UA version 1.02 released

Historie

Overzicht

Microsoft dominate the manufacturing application landscape (COM and DCOM).	1990s	
	1995	Automation vendors form a taskforce OPC. OLE for Process Embedding is
First release of OPC DA		ervices.
OPC Alarms & Events released	1999	
	2001	OPC Historical Data Access, Batch and security are released.
OPC Complex Data, Data eXchange and XML-DA are released.	2003	
	2004	OPC commands released.
OPC UA version 1.0 released.	2006	
	2007	OPC Certification Program and test labs
OPC UA version 1.01 released.	2009	
	2010	Embedded OPC UA devices released
IEC 62541 is released.	2012	
	2013	OPC UA version 1.02 released

OLE for Process Control

Historie

Overzicht

Microsoft dominate the manufacturing application landscape (COM and DCOM).	1990s
	1995 Automation vendors form a taskforce OPC. OLE for Process Embedding is
First release of OPC DA	
	ervices.
OPC Alarms & Events released	1999
	OPC Historical Data Access, Batch and security are released.
OPC Complex Data, Data eXchange and XML-DA are released.	
	OPC commands released.
OPC UA version 1.0 released.	
	OPC Certification Program and test labs
OPC UA version 1.01 released.	2009
	2010 Embedded OPC UA devices released
IEC 62541 is released.	2012
	2013 OPC UA version 1.02 released

OLE for Process Control

Historie

Overzicht

Microsoft dominate the manufacturing application landscape (COM and DCOM).	1990s
	1995 Automation vendors form a taskforce OPC. OLE for Process Embedding is
First release of OPC DA	
	ervices.
OPC Alarms & Events released	1999
	OPC Historical Data Access, Batch and security are released.
OPC Complex Data, Data eXchange and XML-DA are released.	
	OPC commands released.
OPC UA version 1.0 released.	
	2007 OPC Certification Program and test labs
OPC UA version 1.01 released.	2009
IEC 6	
	2013 OPC UA version 1.02 released

OLE for Process Control

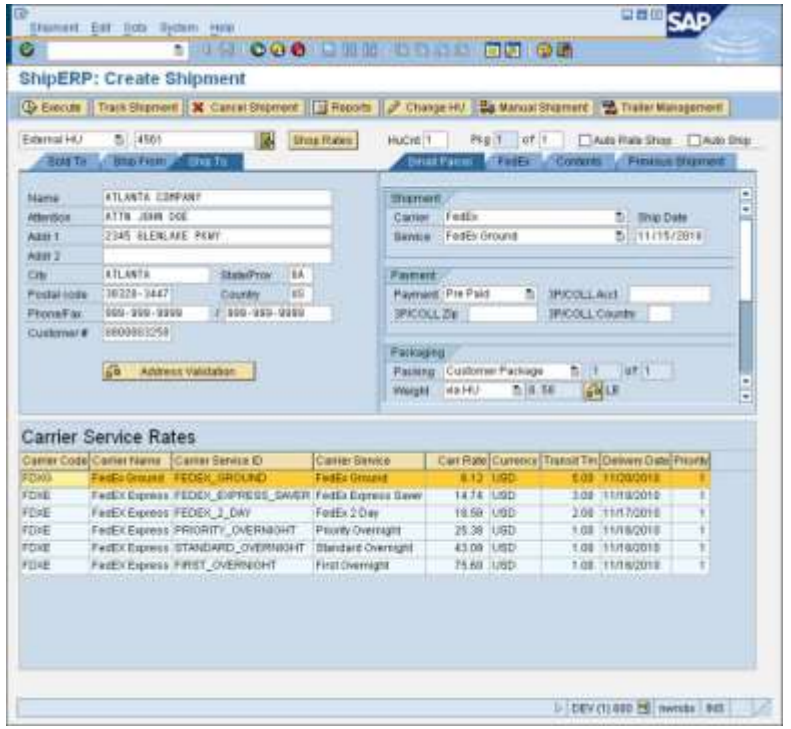
Open Platform Communications

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

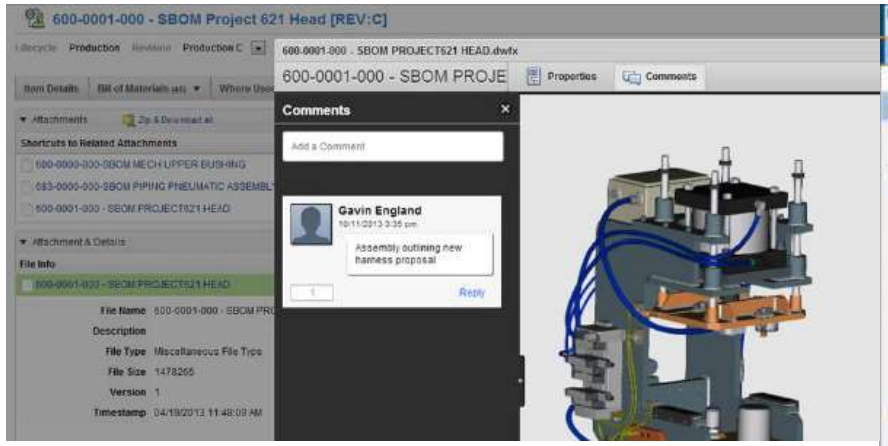
OT landschap

ERP

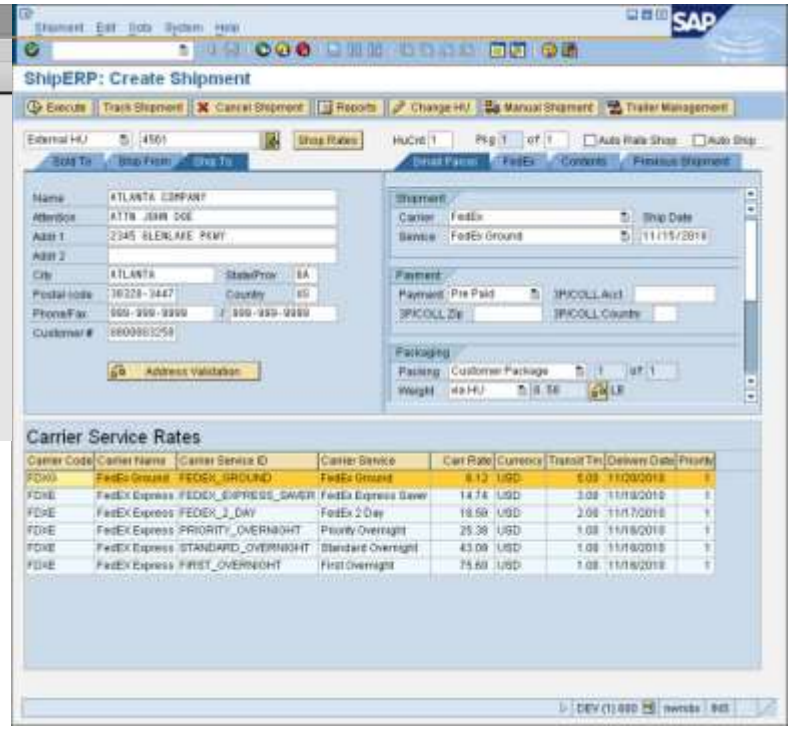


OT landschap

PLM



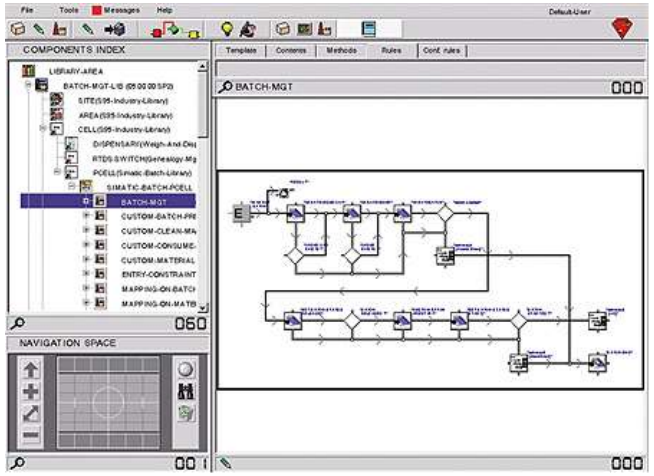
ERP



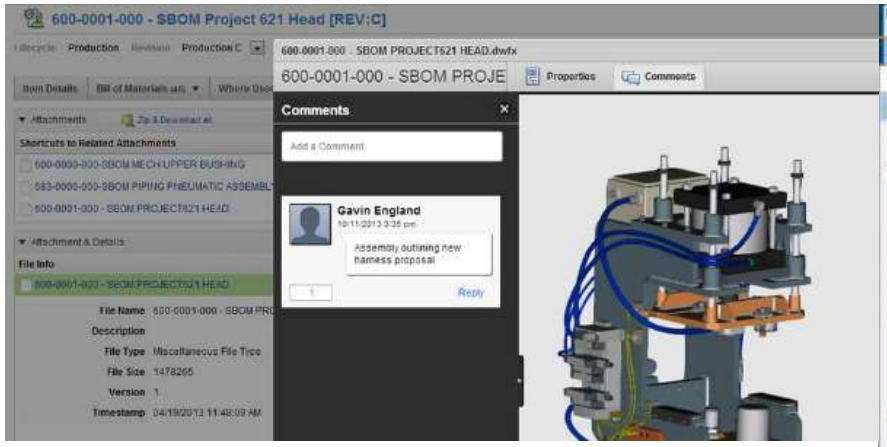
PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

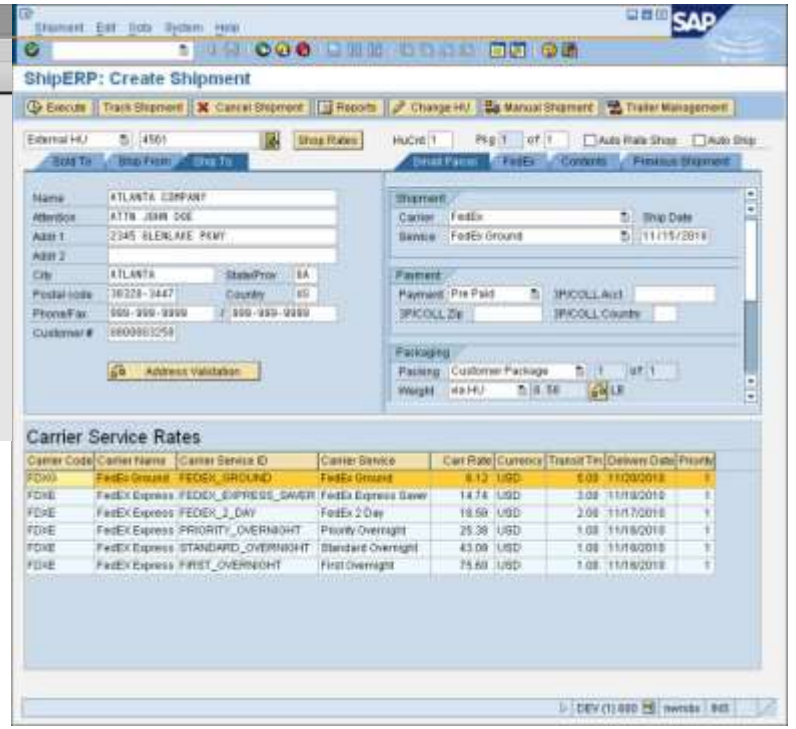
MES/MOM



PLM



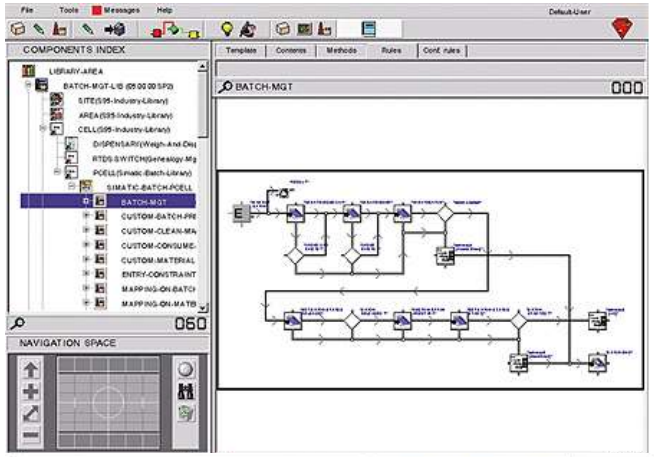
ERP



PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

MES/MOM



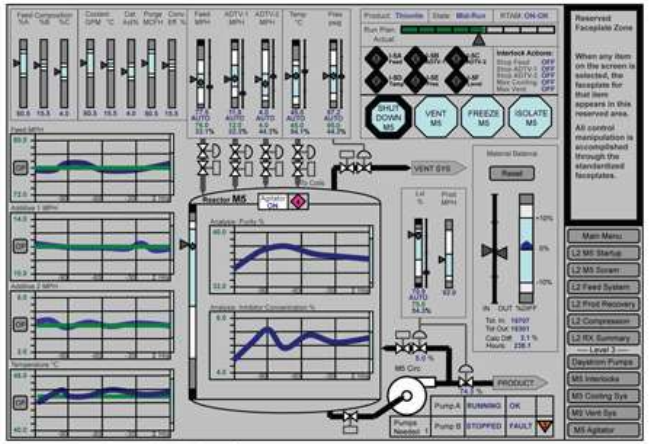
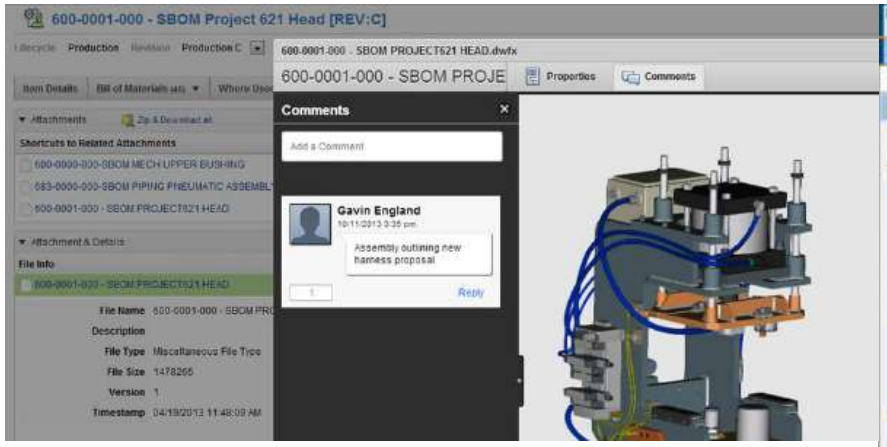
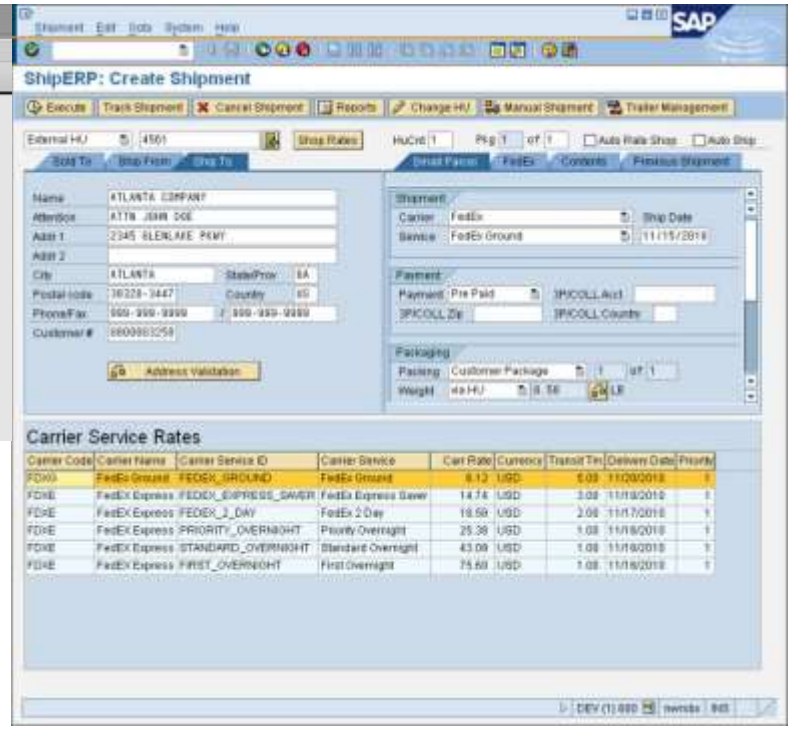


Figure 4: Example Level 2 display of a reactor

PLM



ERP

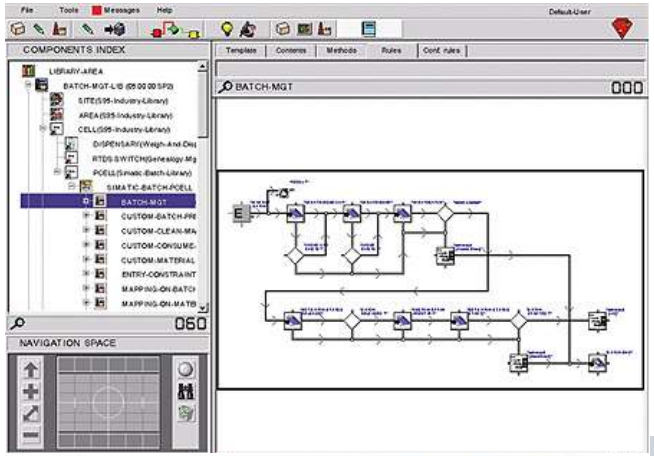


SCADA

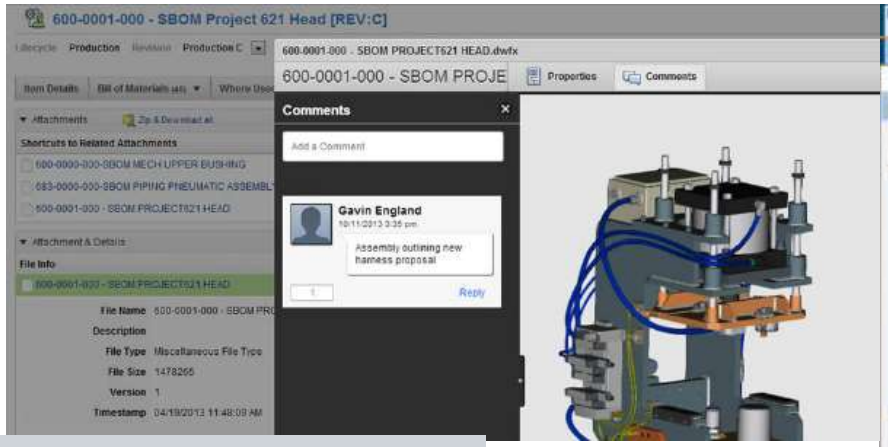
PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

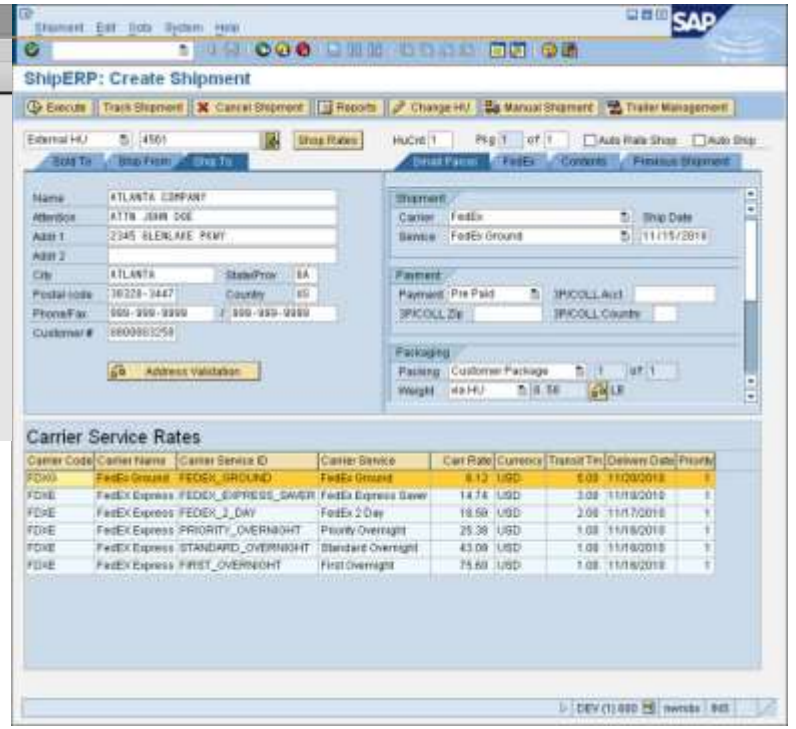
MES/MOM



PLM



ERP



SCADA

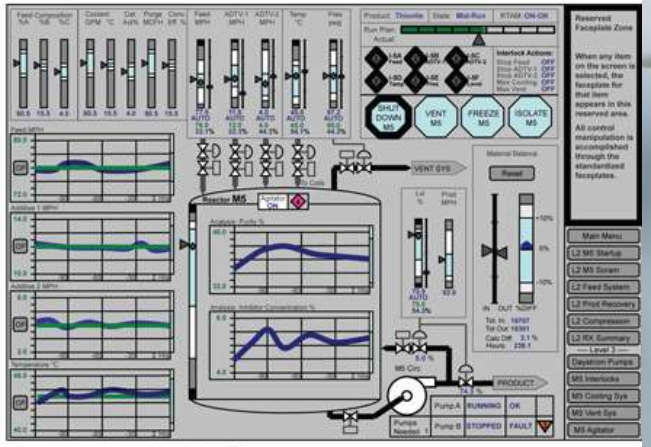
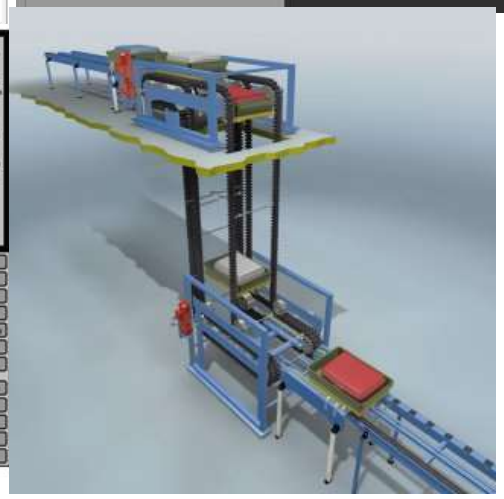


Figure 4: Example Level 2 display of a reactor

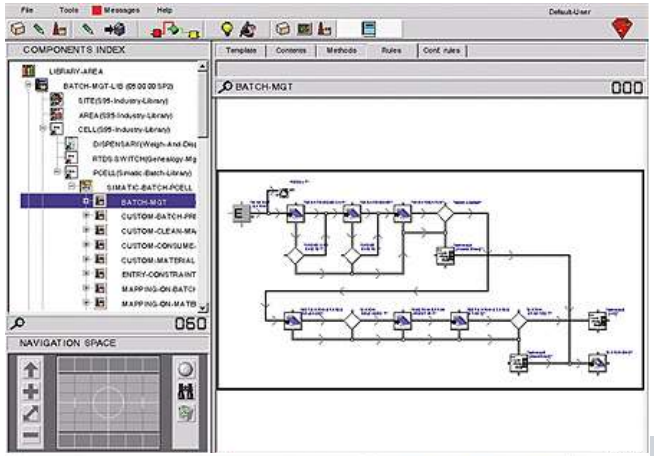
PLC



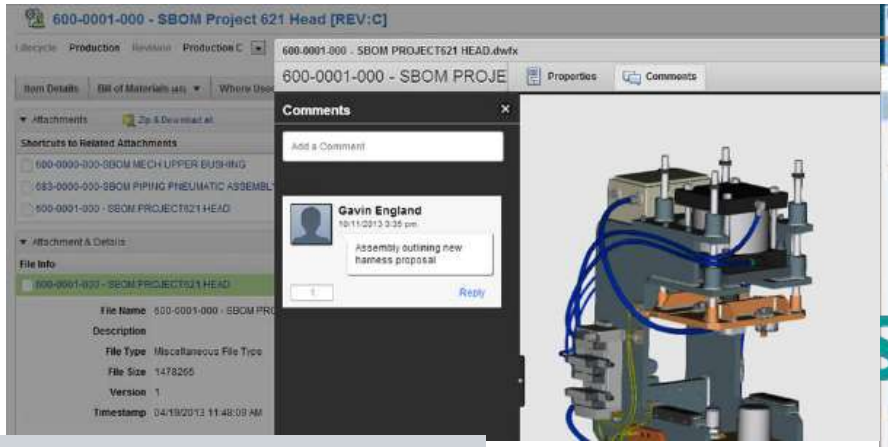
PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

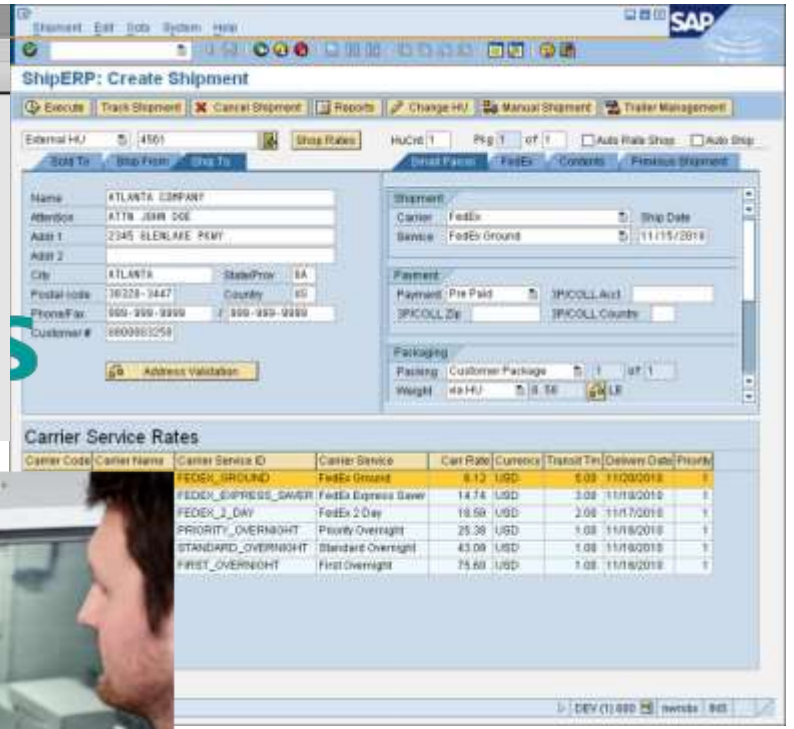
MES/MOM



PLM



ERP



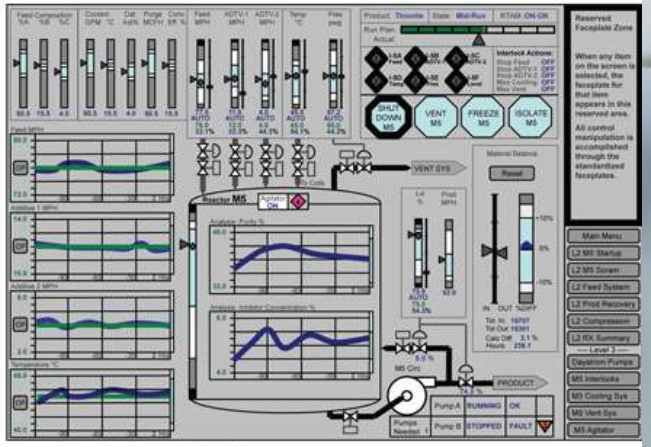
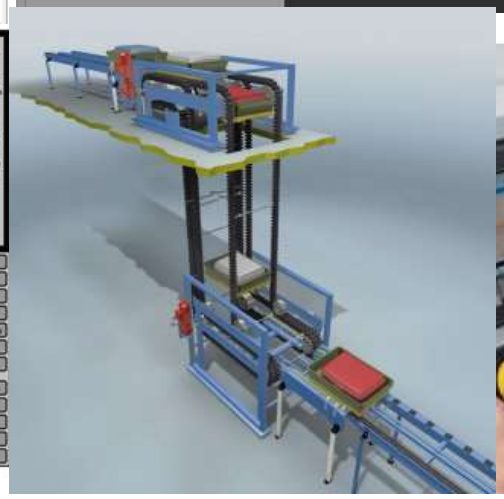


Figure 4: Example Level 2 display of a reactor



SCADA

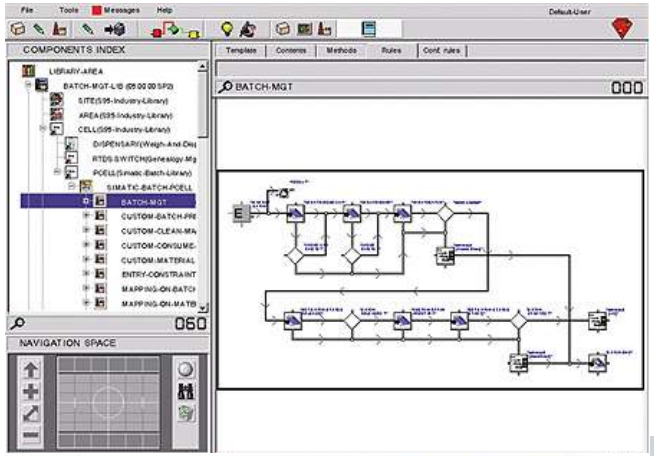
PLC

CAD/CAM

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

MES/MOM



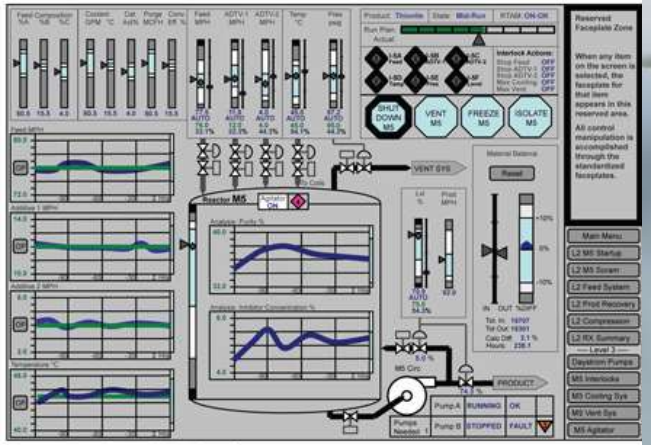
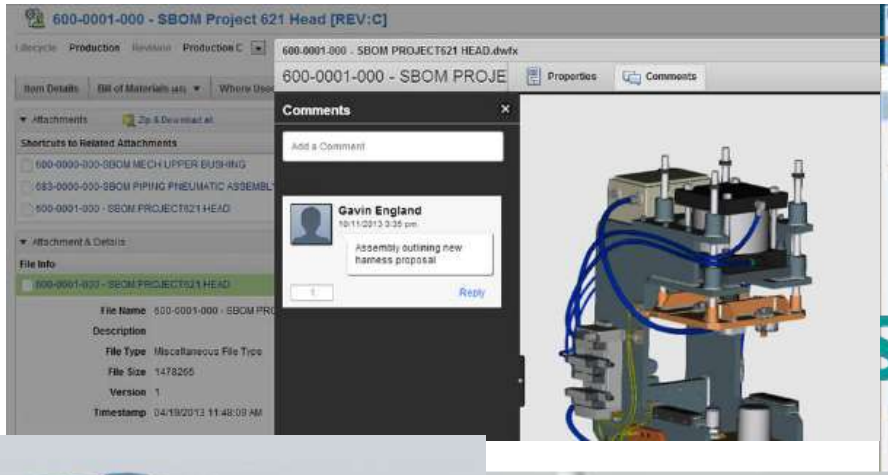
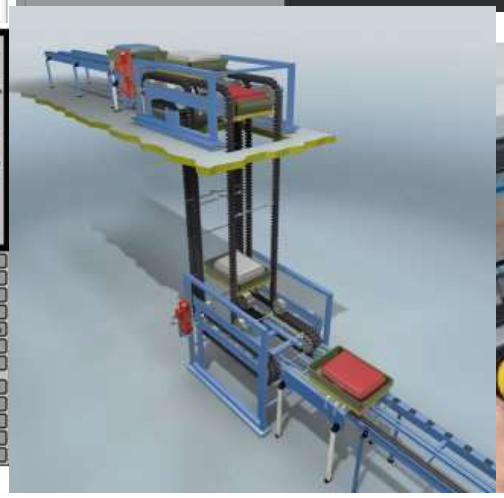


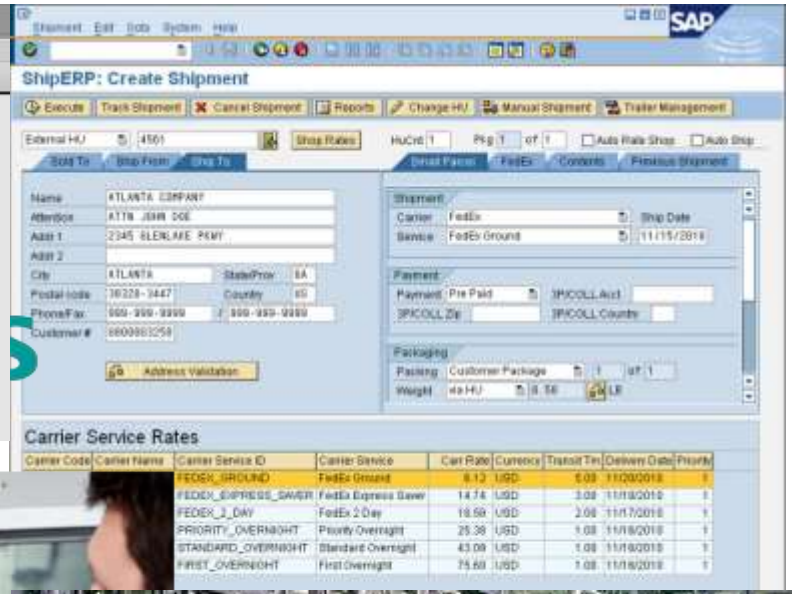
Figure 4: Example Level 2 display of a reactor

PLM





ERP



SCADA

PLC

CAD/CAM

DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

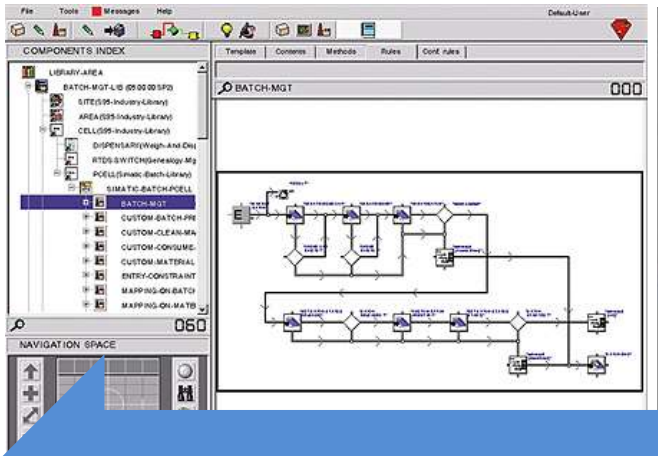
OT landschap werkelijkheid

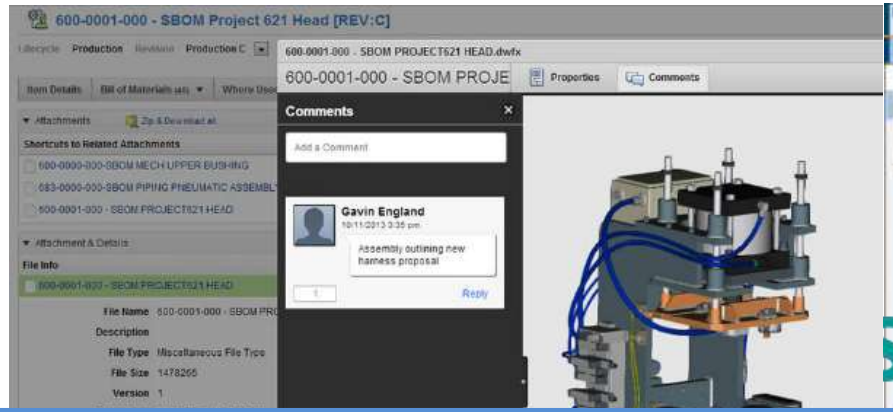
Applicatie integratie

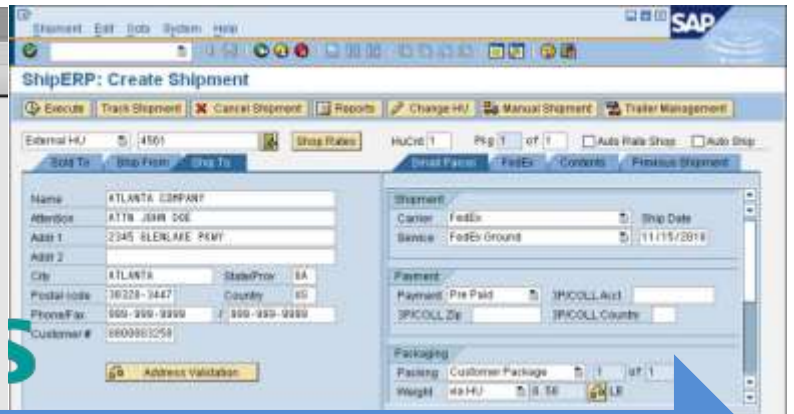
MES/MOM

PLM

ERP







(Industrial) Ethernet

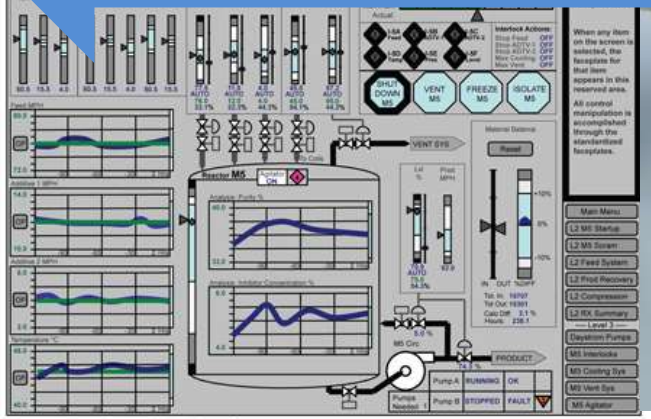


Figure 4: Example Level 2 display of a reactor

SCADA

PLC

CAD/CAM

DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

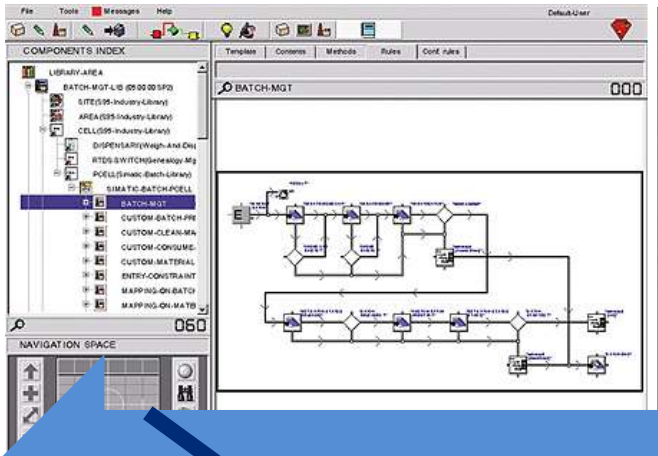
OT landschap werkelijkheid

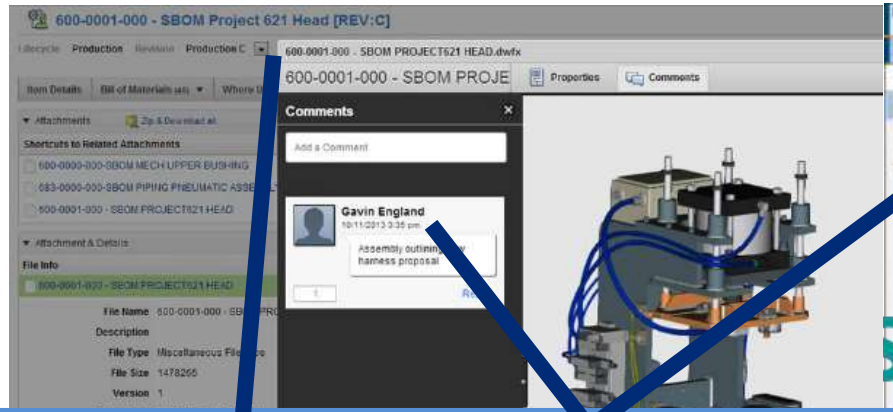
Applicatie integratie

MES/MOM

PLM

ERP





(Industrial) Ethernet

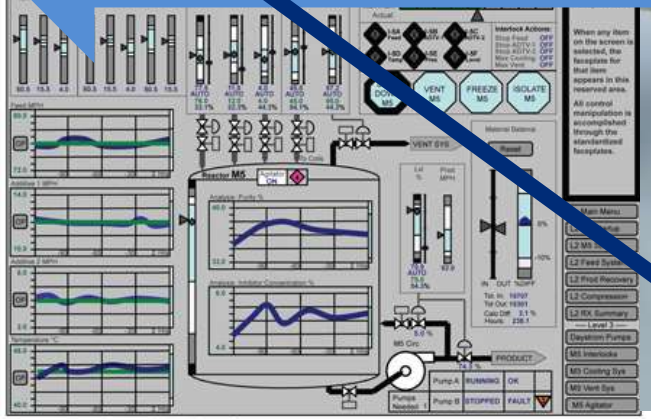


Figure 4: Example Level 2 display of a reactor

SCADA

PLC

CAD/CAM

DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

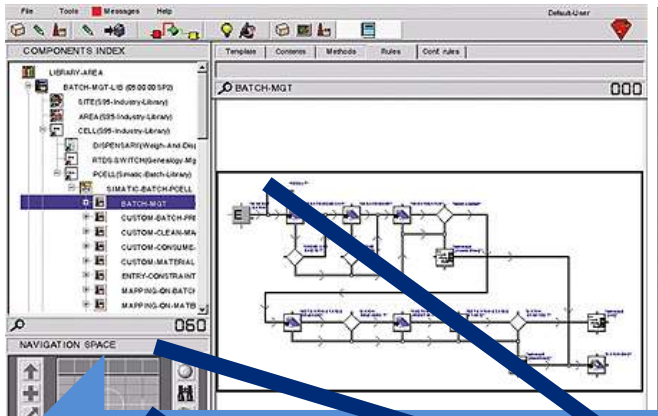
OT landschap werkelijkheid

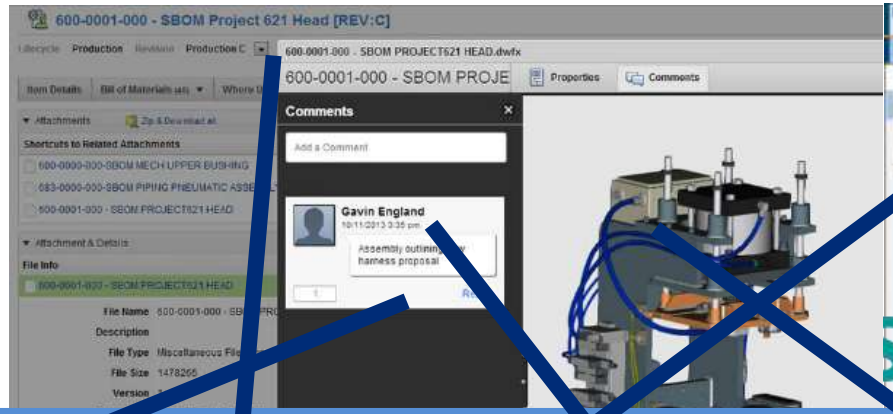
Applicatie integratie

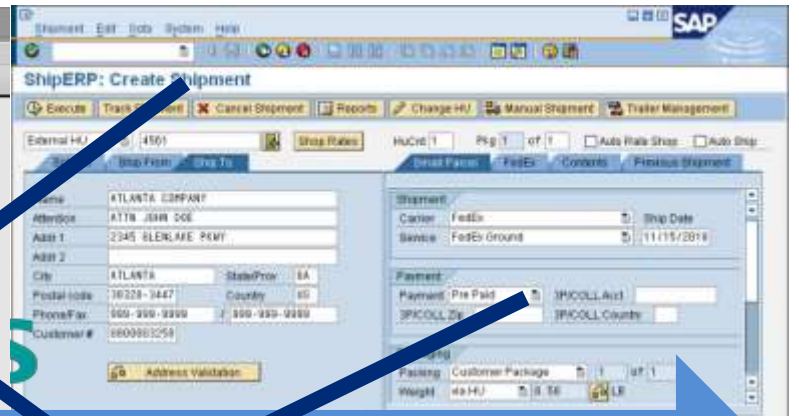
MES/MOM

PLM

ERP







(Industrial) Ethernet

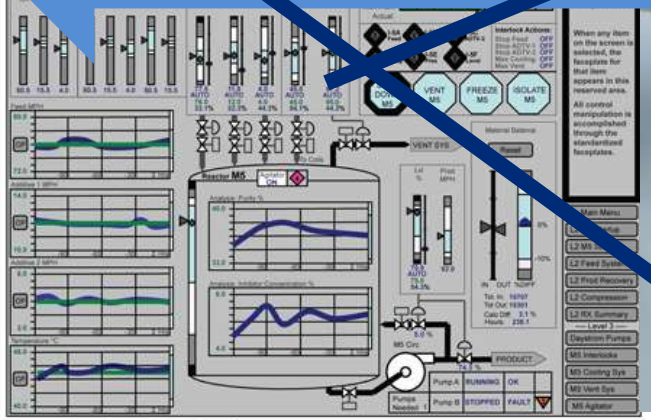
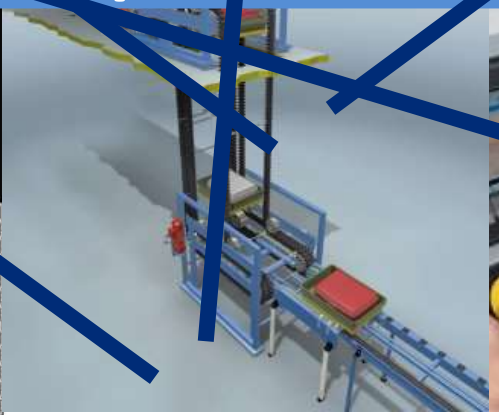


Figure 4: Example Level 2 display of a reactor



SCADA

PLC

CAD/CAM

DCS

OT landschap werkelijkheid

Applicatie integratie

MES/MOM

PLM

ERP

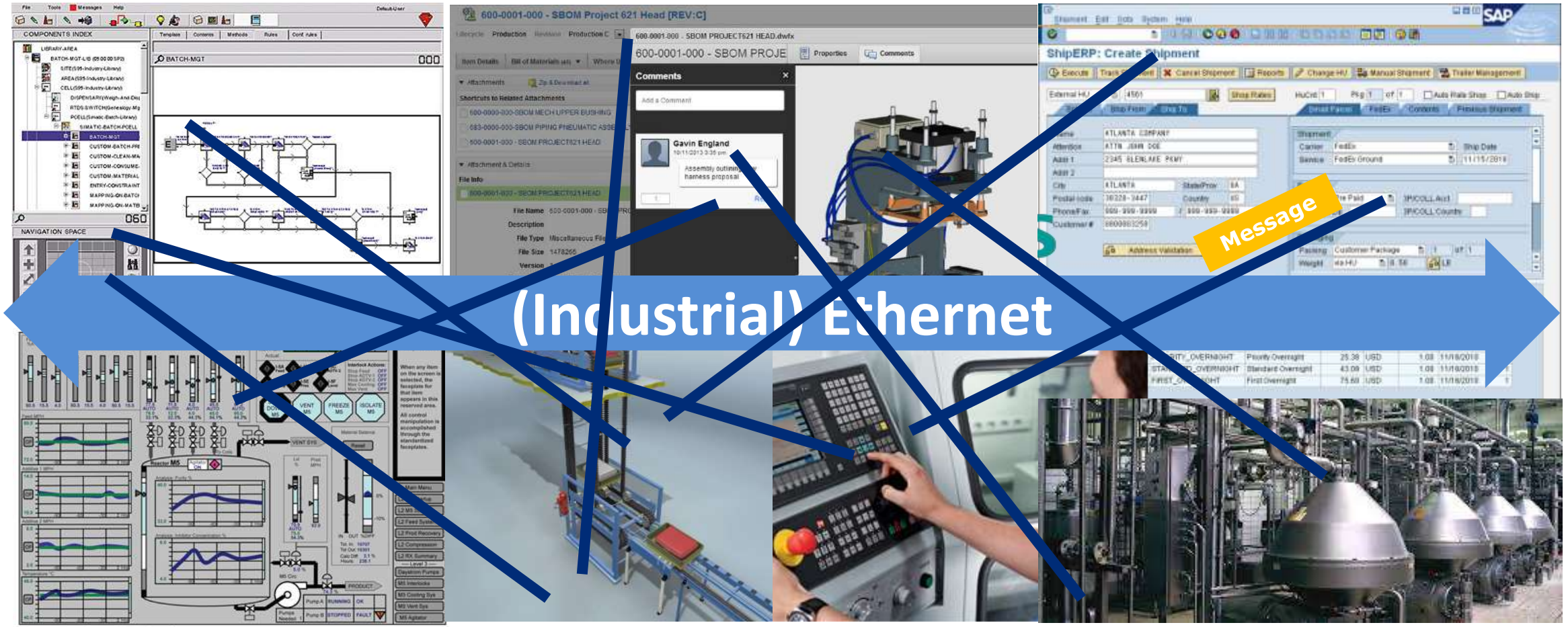


Figure 4: Example Level 2 display of a reactor

SCADA

PLC

CAD/CAM

DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap werkelijkheid

Applicatie integratie

MES/MOM

PLM

ERP

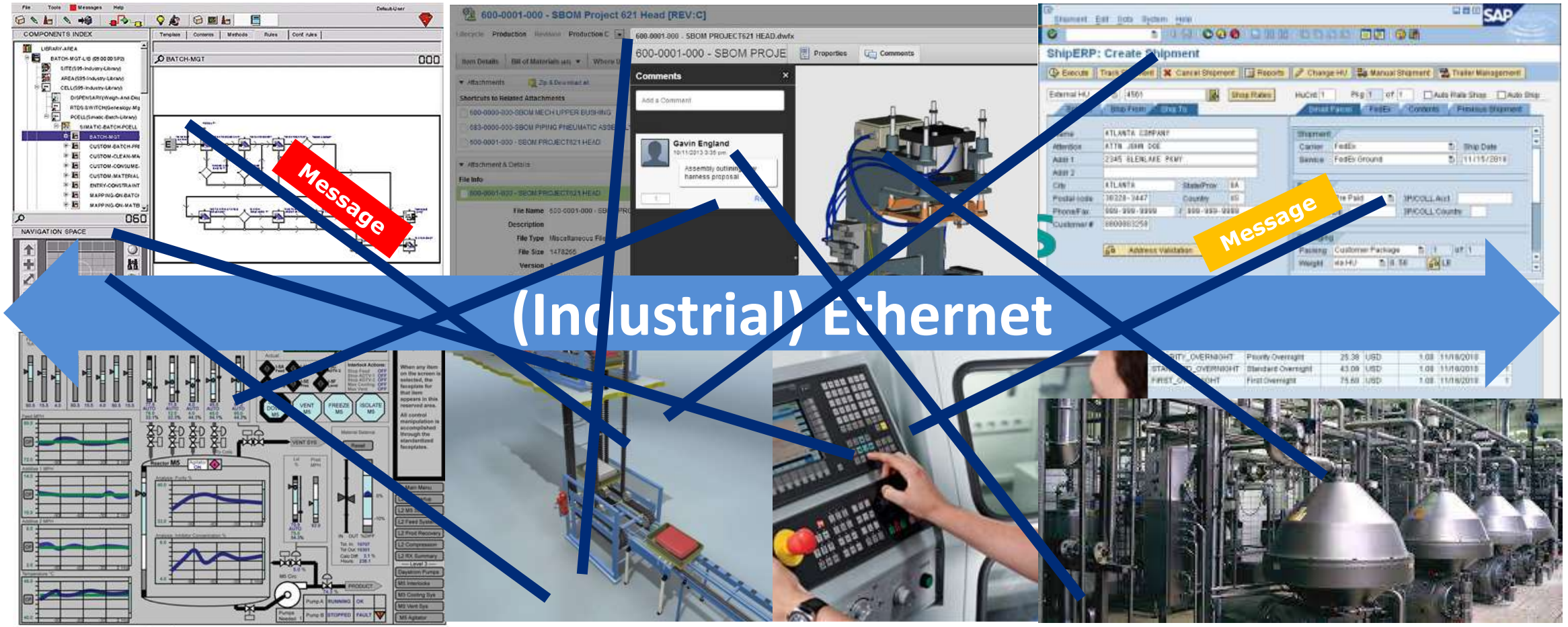


Figure 4: Example Level 2 display of a reactor

SCADA

PLC

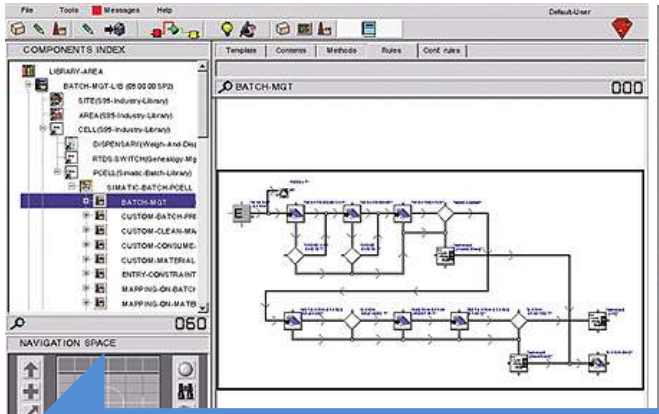
CAD/CAM

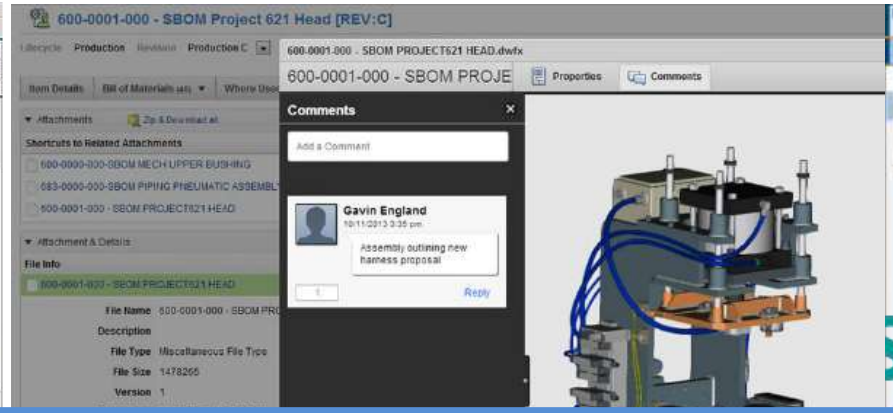
DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

MES/MOM **PLM** **ERP**





(Industrial) Ethernet

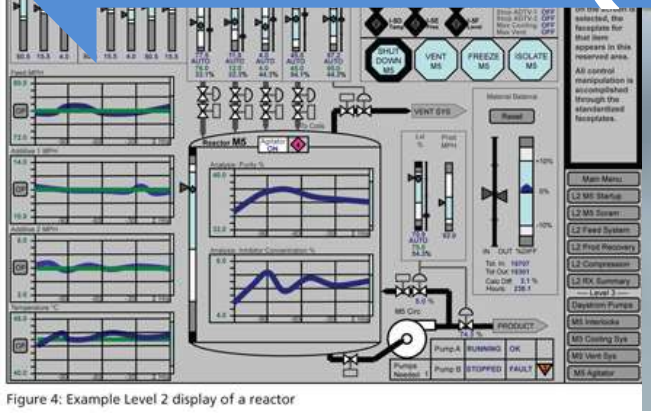


Figure 4: Example Level 2 display of a reactor

SCADA **PLC** **CAD/CAM** **DCS**

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

OT landschap

MES/MOM

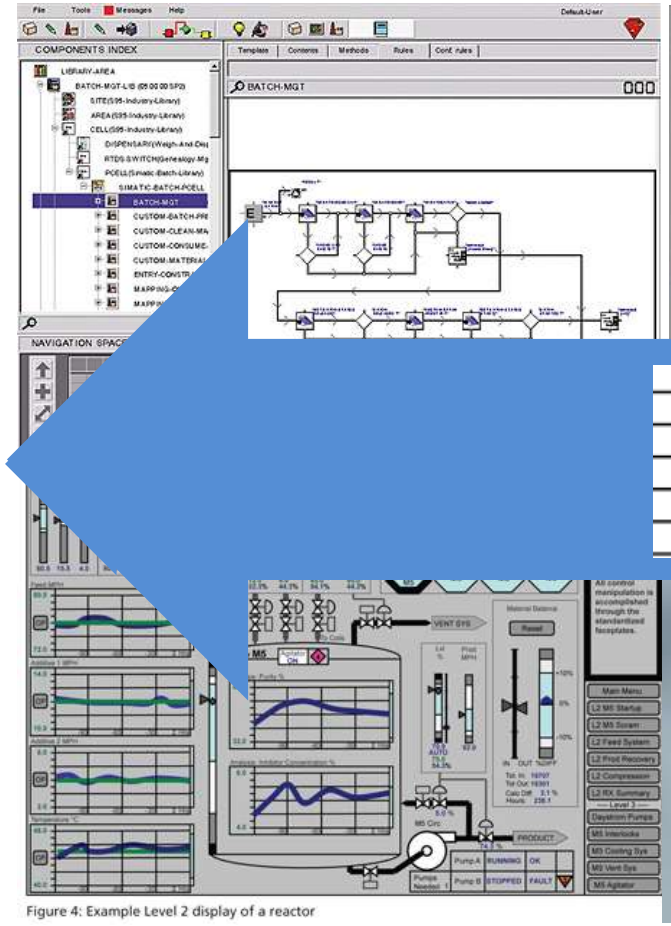
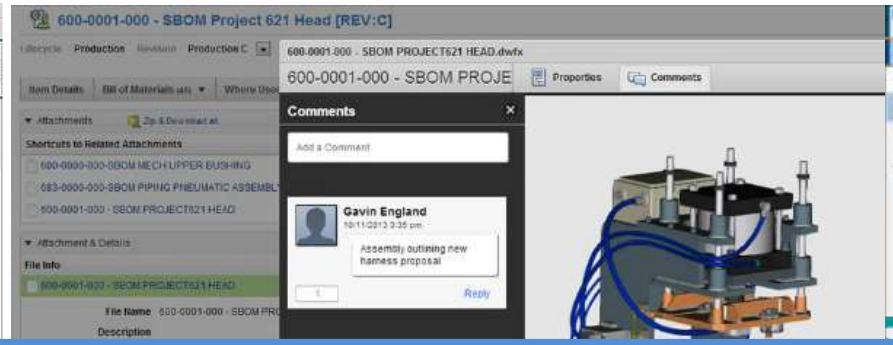
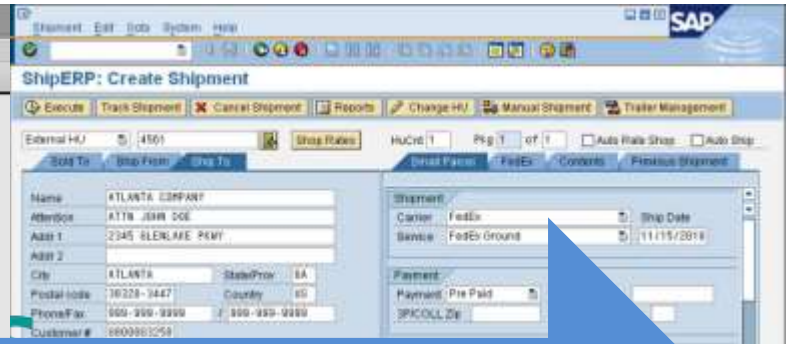


Figure 4: Example Level 2 display of a reactor

PLM



ERP



OPC UA™

SCADA

PLC

CAD/CAM

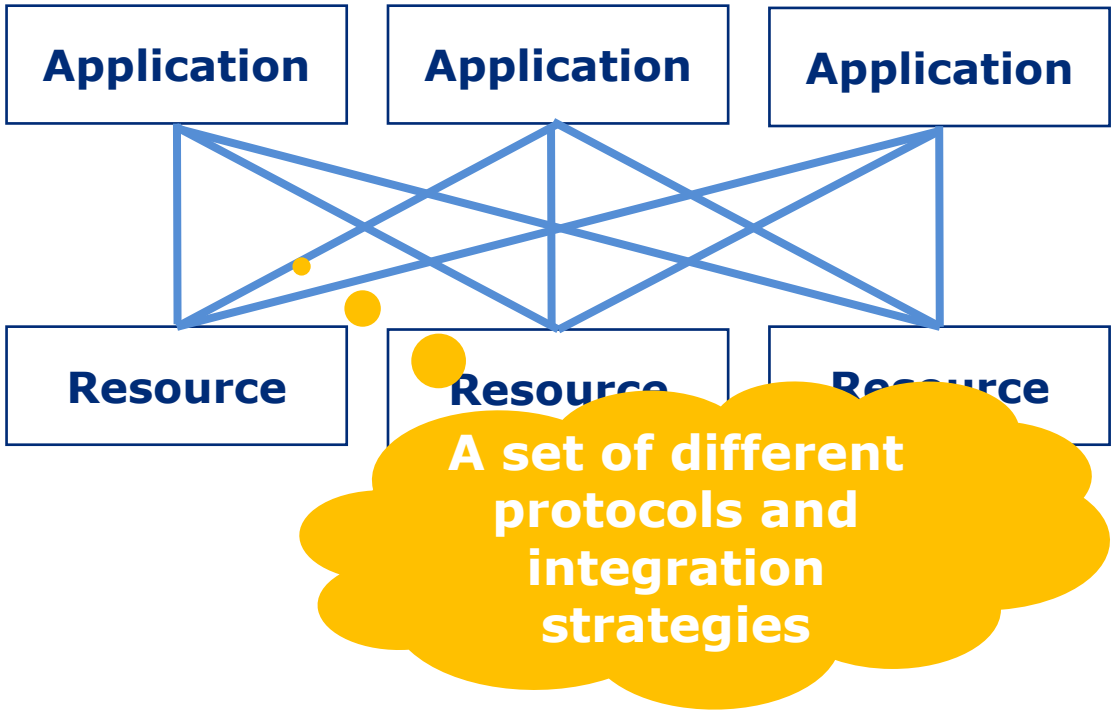
DCS

PRODUCTIE PROCES AUTOMATISERING PPA 22
Industrie 4.0 Cyber Security
Industrial Internet of Things Data
Cloud IT/OT Integration

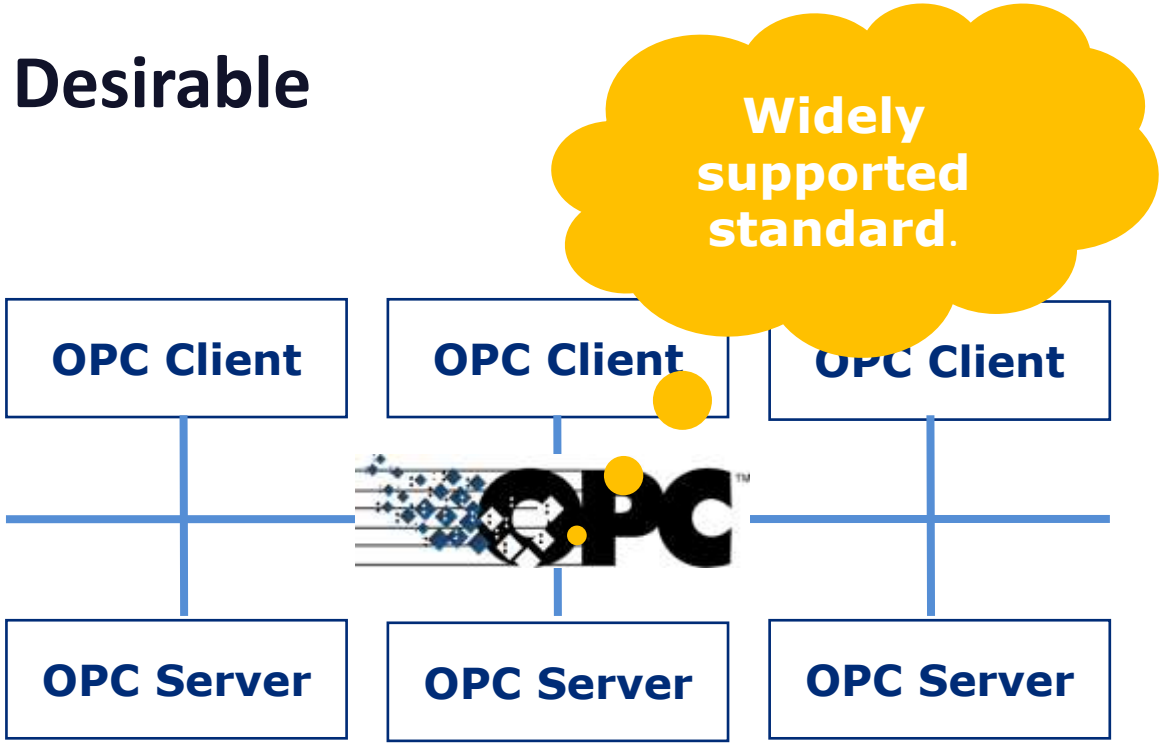
Historie

OPC Classic

Usual



Desirable

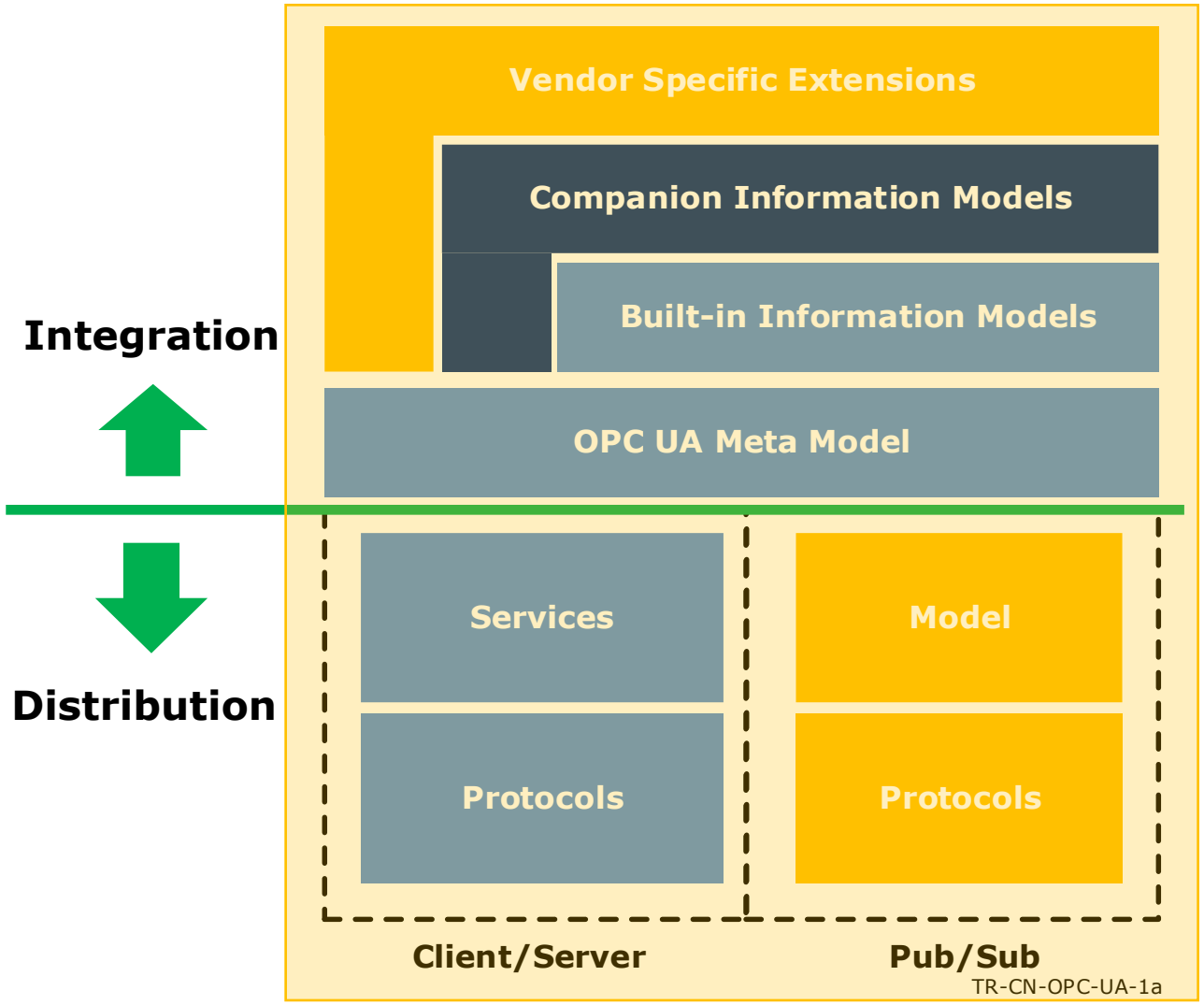


Wat is OPC UA

Ontwerp doelen OPC UA

- Applicaties ondersteunen die complexe data gebruiken.
- Metadata gebruiken zodat generieke clients data kunnen interpreteren zonder à priori voorkennis.
- Gebruik maken van algemeen gangbare internet standaarden (Web services, XML, HTTP, TCP…)

Overzicht opbouw OPC UA



- Twee delen:
  - Distributie : communicatie;
  - Integratie: Informatie model.
- Service oriented Architecture.

Companion information models

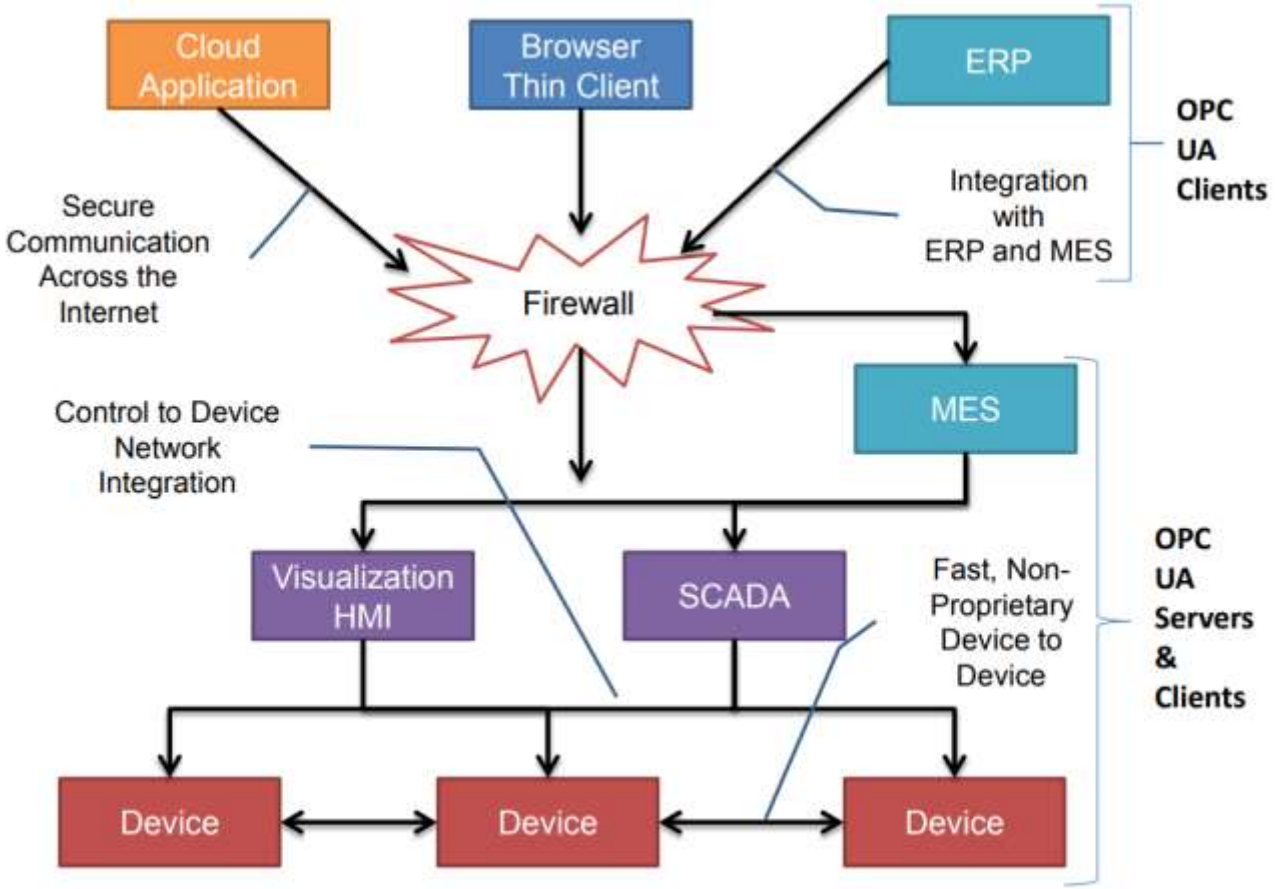
- OPC UA Informatie model 30140 (Profinet)
- OPC UA Informatie model voor IEC 61131-3 (PLCopen)

PLCopen®
for efficiency in automation

OPC UA toepassingen

OPC UA

Betrouwbaarheid



OPC UA

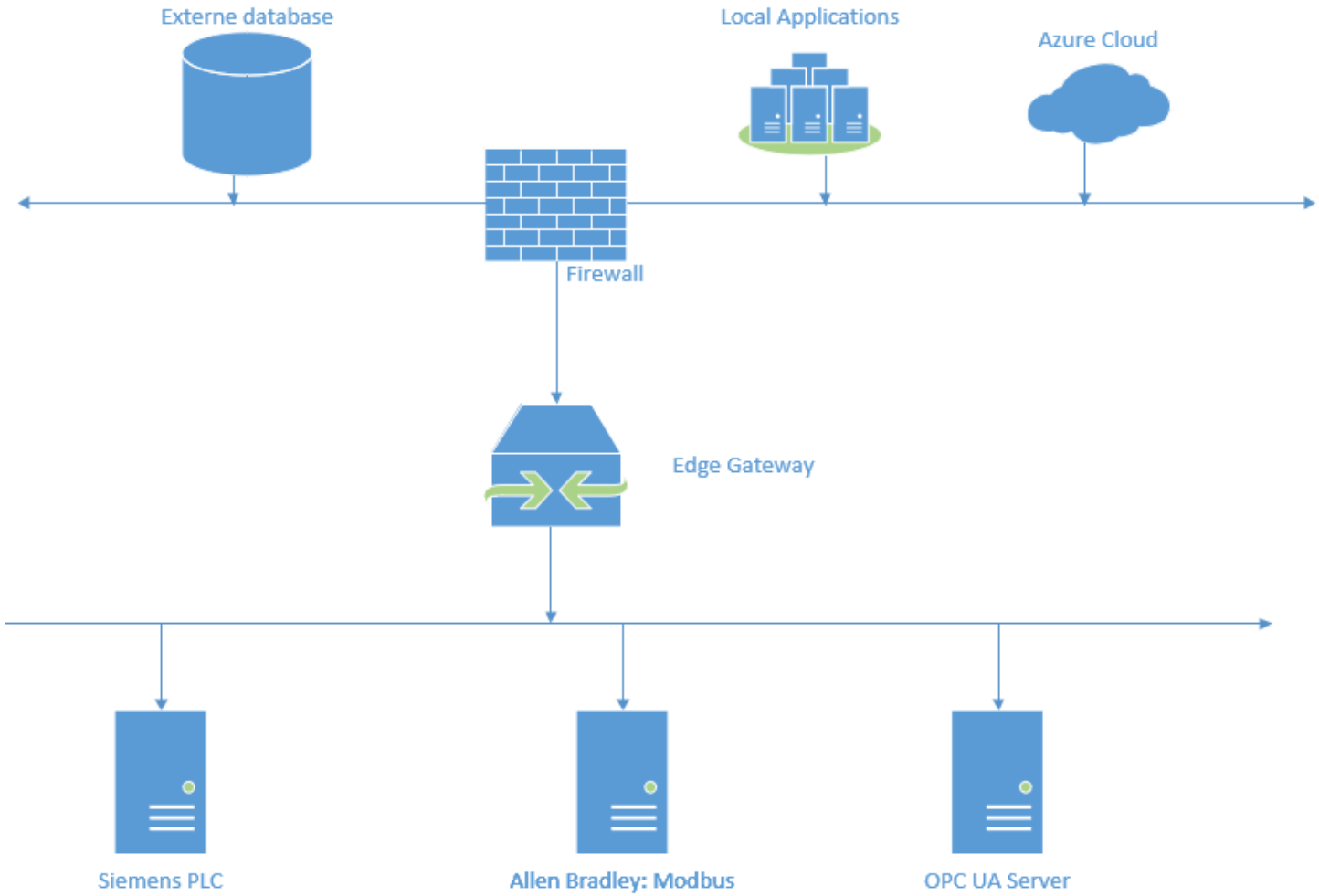
Trends

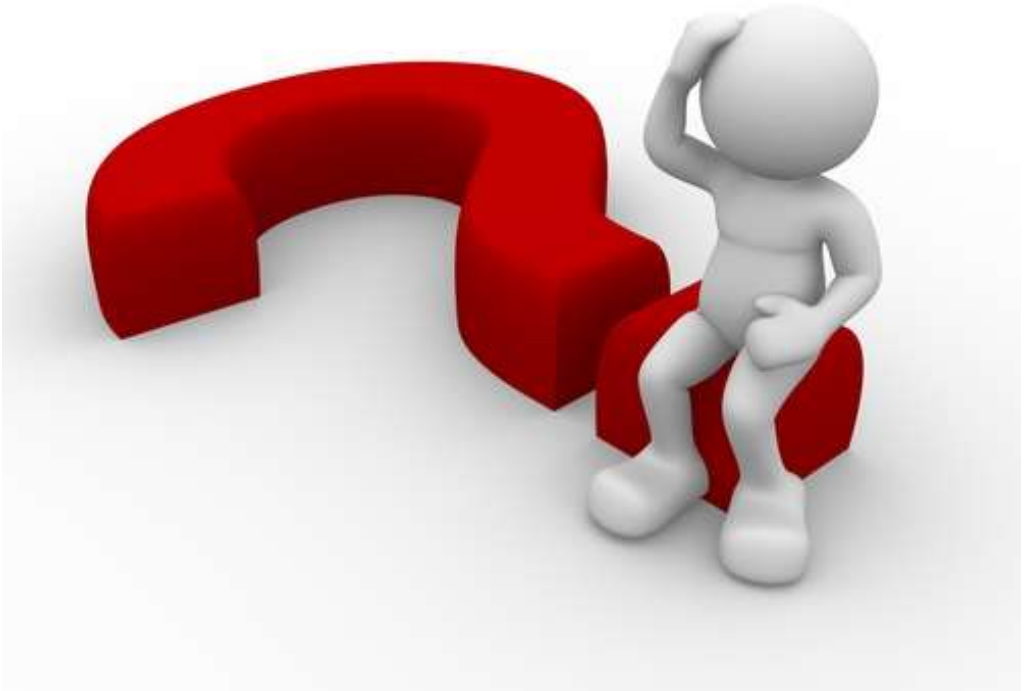
- OPC UA on Chip
  - Sensoren worden uitgerust met een OPC UA interface

- OPC UA (pub/sub) en TSN
  - Om van OPC UA een realtime protocol te maken, moet het in combinatie met TSN worden gebruikt.

OPC UA

Edge gateway



Afsluiting

Vragen?