



Introduction to NE 100 Interface in CAE systems and to the LOP technology

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PROLIST INTERNATIONAL

Welcome

- ***Dr. Peter Zgorzelski***, works in the Process Management Technology staff unit at Bayer Technology Services GmbH and is Office Manager of PROLIST[®] INTERNATIONAL. He is active in NAMUR, eCI@ss, DKE and IEC working groups.



Key benefits through use of the LOP technology:

- Simplifying the engineering process
- Raising the plant documentation quality
- Reducing the costs in engineering and procurement

Contents

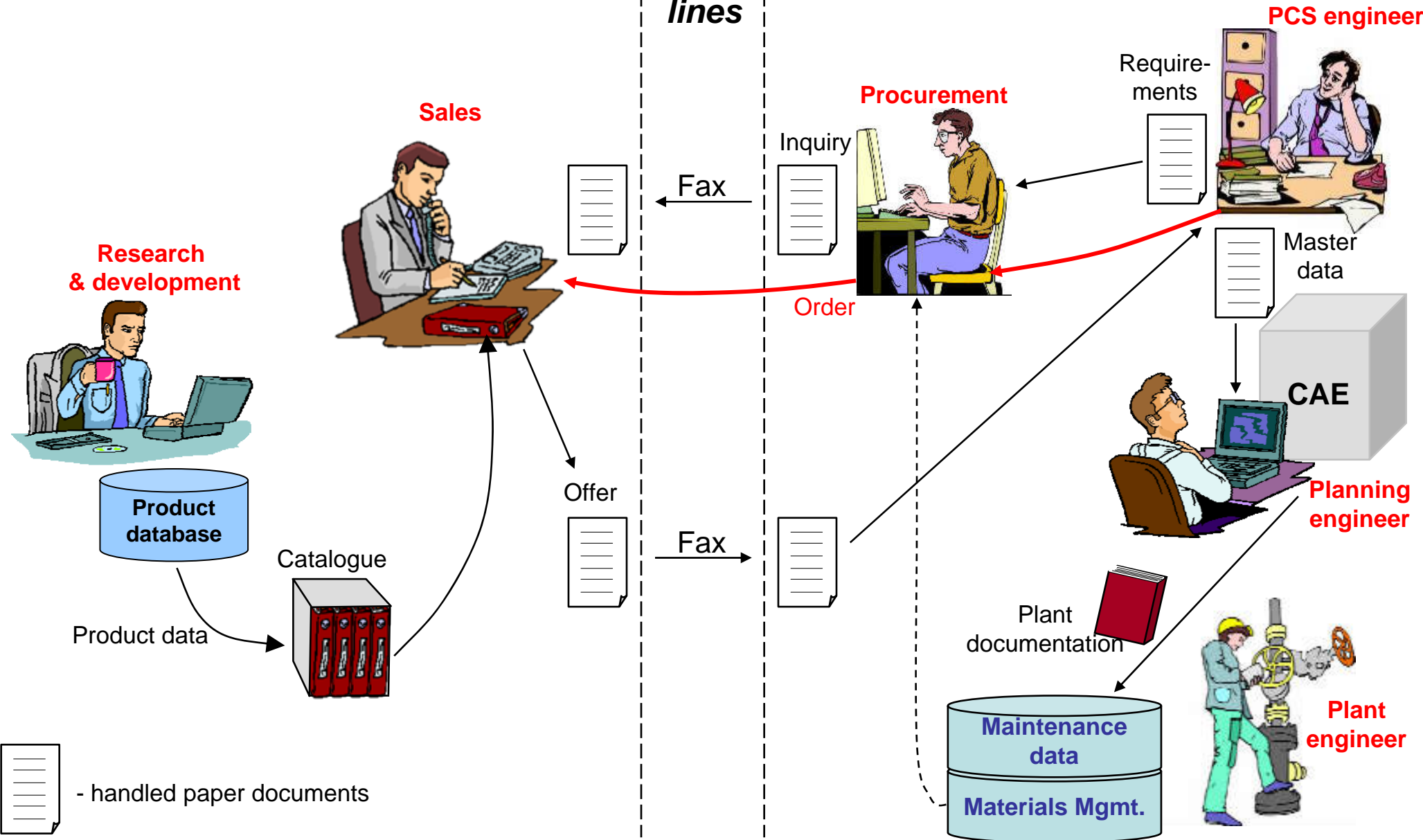
1. Engineering and procurement workflows today and the ones using Lists of Properties (LOP)
2. Structure of an LOP
3. What does one need in a CAE system for implementing the NE 100 interface
4. NE 100 and its international standardization
5. Benefits using LOP technology

Engineering workflow yesterday and today

Supplier site

Phone lines

Customer site



Engineering Workflow

Question:

Can we still afford the costs of this expenditure?

The answer of PROLIST:

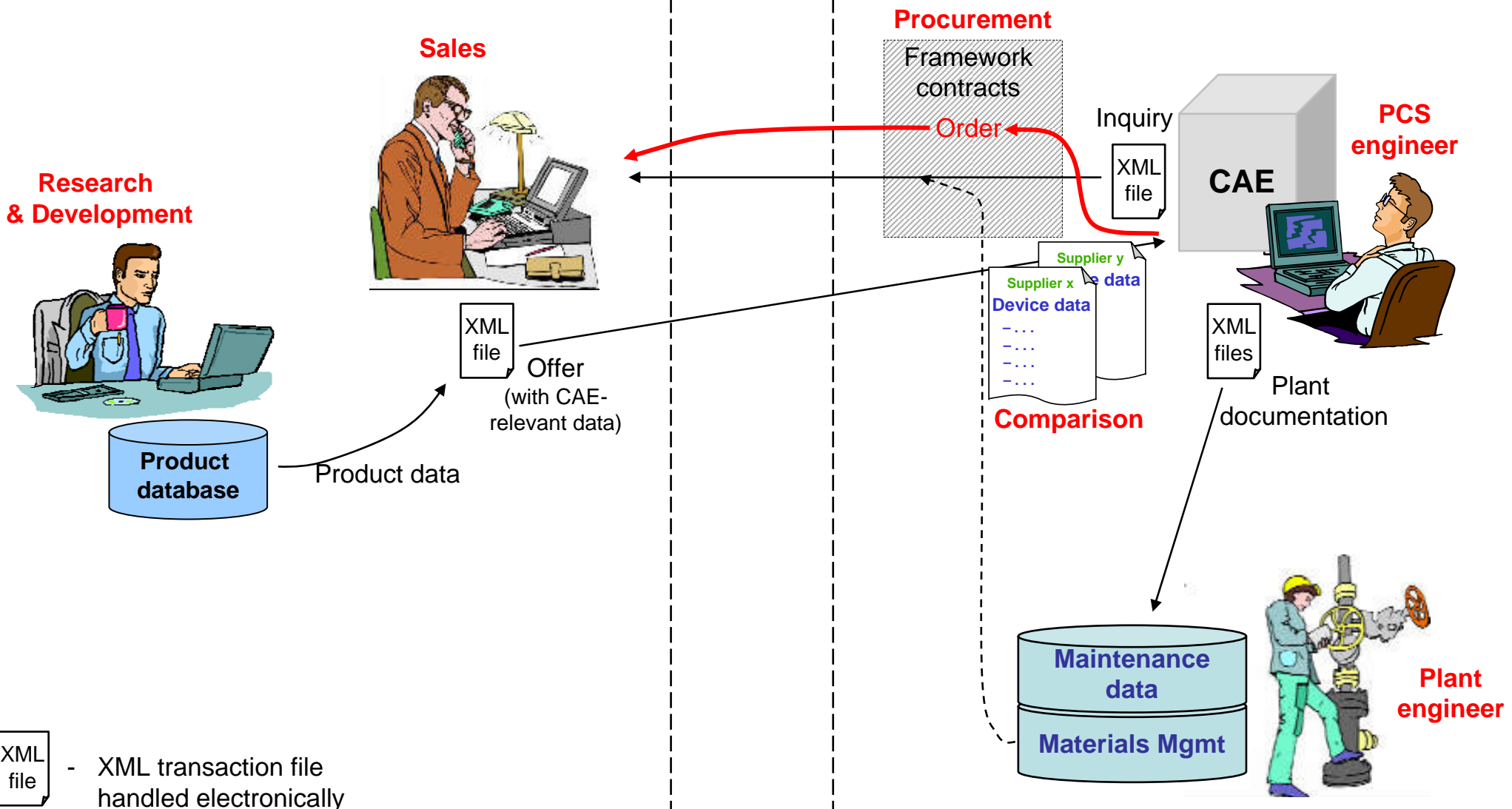
- No.
- We want to reduce engineering and transaction costs for procurement and sales in the area of process control technology.
- To achieve this objective we need international standards concerning LOP technology as well as processes with standardized workflows using XML.

Engineering workflow tomorrow

Supplier site

Web (Internet)

Customer site

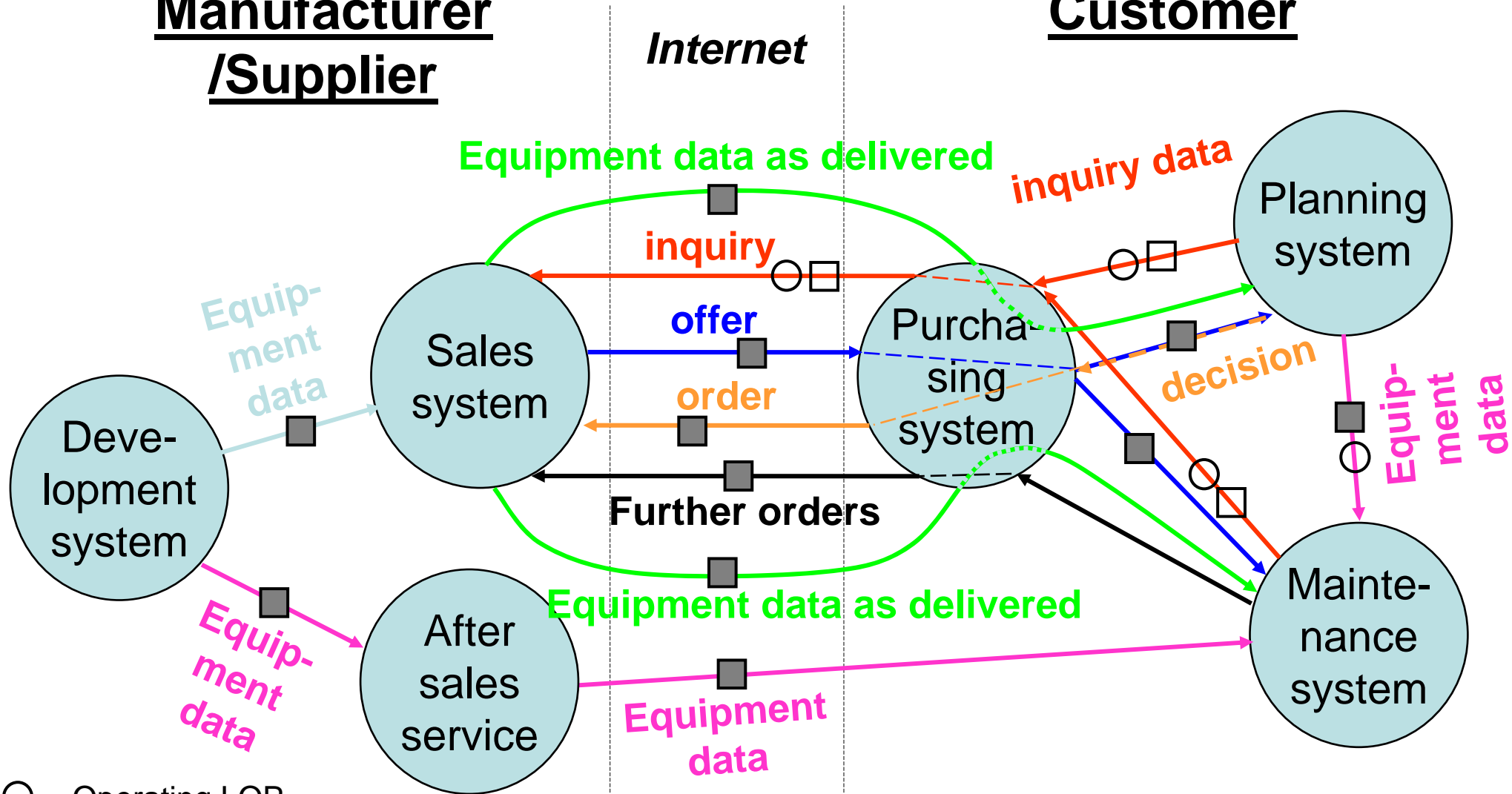


XML file - XML transaction file handled electronically

Use of the Lists of Properties (considering live cycle)

Manufacturer
/Supplier

Customer



- - Operating LOP
 - - Device LOP (in inquiry view)
 - - Device LOP (with all properties)
- LOP – List of Properties

Interpretation of a block of properties

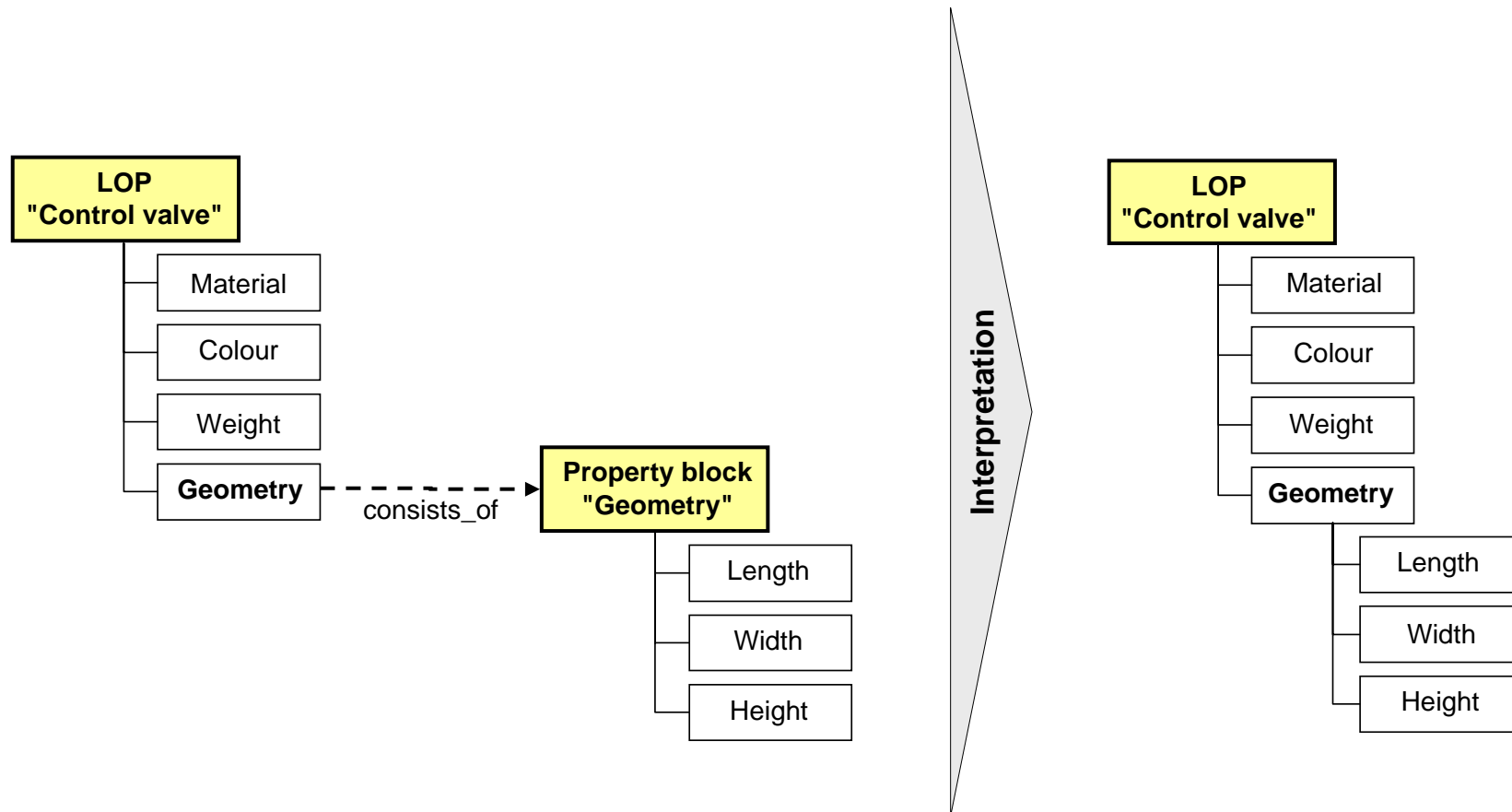
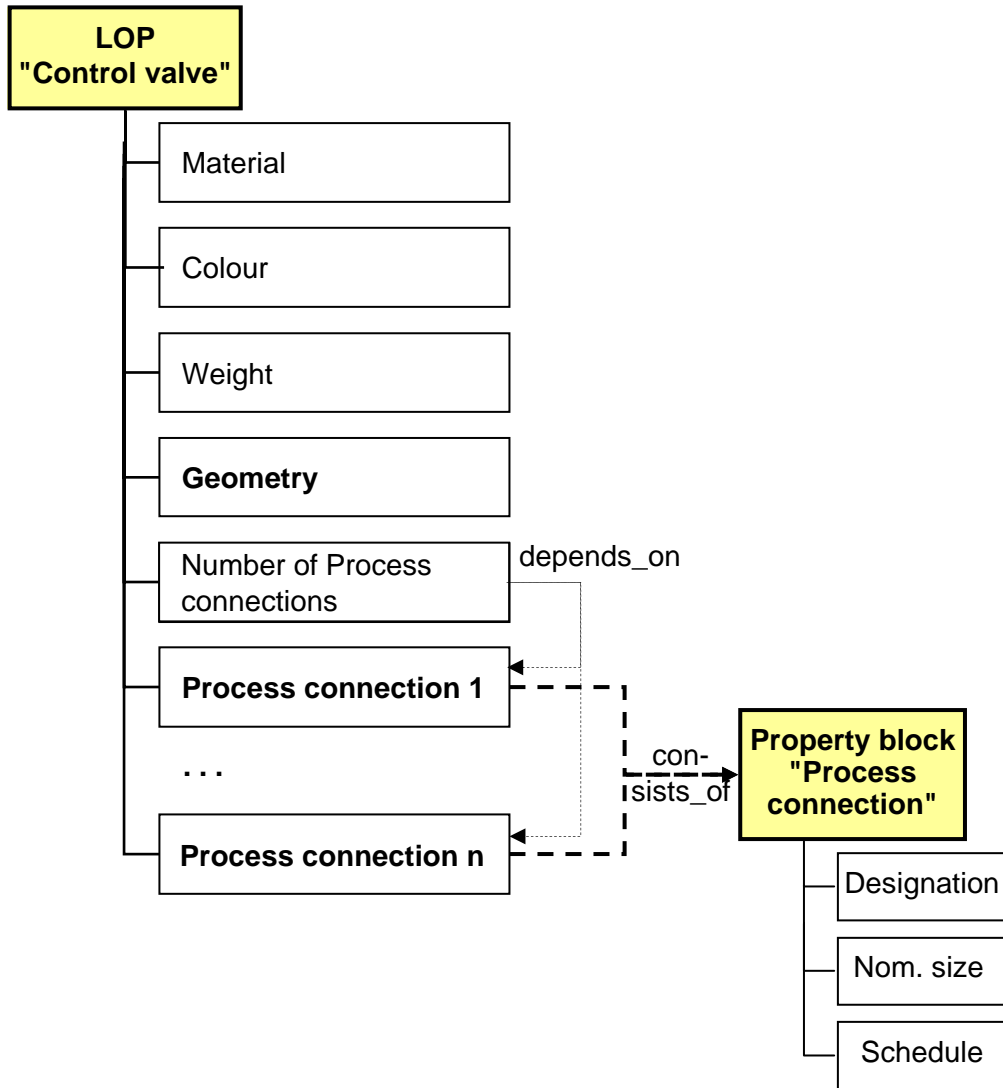
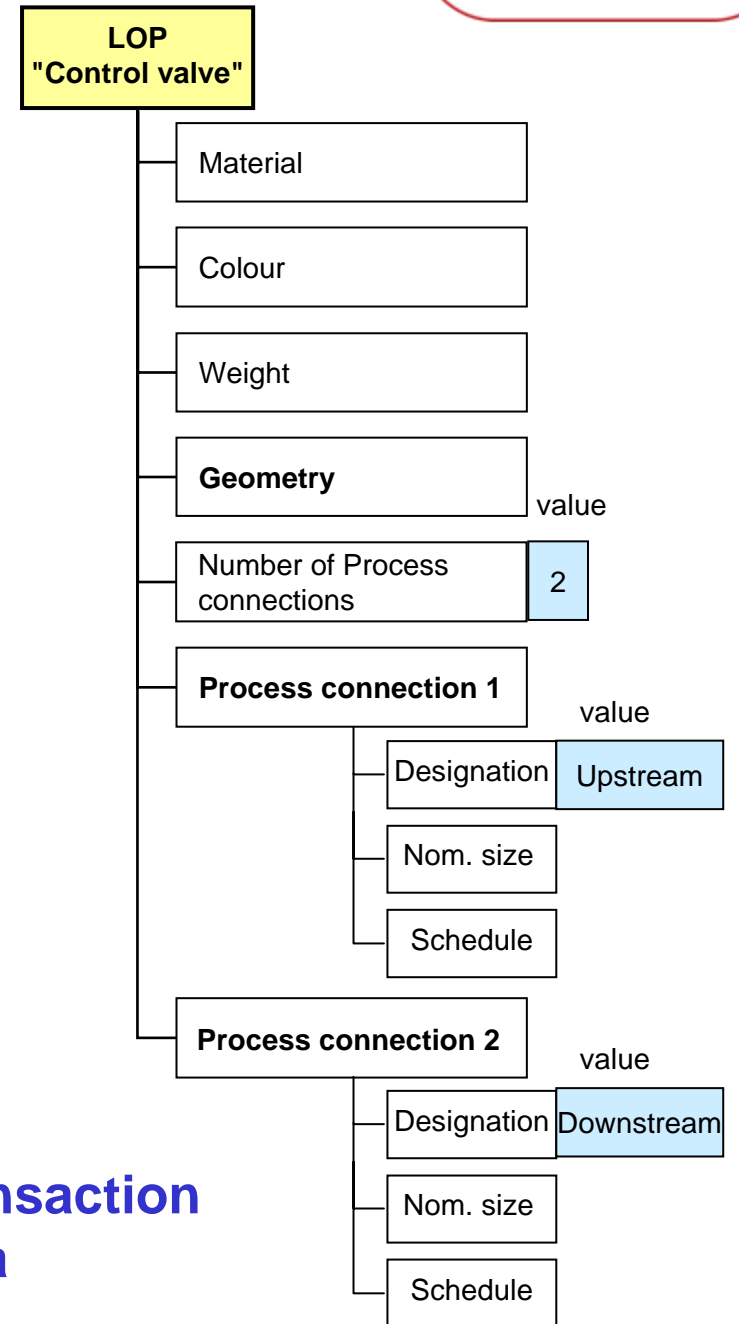


Illustration of cardinality



Interpretation



Structural data

Transaction data

A List of Properties with block structure

Blocks:

Device list of characteristics of flowmeter (mass, Coriolis)		
Device data		
Equipment labeling/tag		
Identification		
Manufacturer		
Supplier		
Product name		
Product type		
Manufacturer's order code		
Article number		
EAN code		
ERP system inventory number		
Software version		
Hardware version		
Serial number		
Electronic insert		
Device labeling/tag		
Nameplate language		
Function and system design		
Measuring principle		
System architecture		
Parameterization software		
Communication and data processing		
Digital communication		
Protocol type		
Communication interface		
Maximum signal cable length		m
Signal cable shielding		

Device
identification

Function
and
system
design

Prerequisite for gaining the benefits

- The LOPs technology can be implemented in tools like CAE systems
- The most important precondition for achieving all of the benefits for process control equipment on the user side is to have a CAE system with an implemented NE 100 interface
- *Note: Nobody who uses LOPs needs to know how the LOPs are structured. He/she merely requires an appropriate tool.*

NE 100 and its international standardization

- PROLIST INTERNATIONAL creates LOPs for process control equipment and publishes them in the NAMUR recommendation NE 100
- The contents of NE 100 has been channeled into an international standardization process.
- The first standards are introduced in the standard series IEC 61987: *„Industrial-Process Measurement and Control - Data Structures and Elements in Process Equipment Catalogues”*
- *Part 10: “Lists of Properties (LOPs) for Industrial-Process Measurement and Control for Electronic Data Exchange - Fundamentals”*
 - has FDIS status, till end of 2009 will be IS
- *Part 11: “List of Properties (LOP) for Measuring Equipment for electronic data exchange – Generic structures“*
 - has CD status (August 2009)
- Next standards will follow

PROLIST INTERNATIONAL members



ABB **NTB** **BASF** **BAYER** **Bopp & Reuther Messtechnik GmbH**

AFASSELT **WAGO** **EMERSON** **COOPER**

WACKER **TECHNISCHE UNIVERSITÄT DRESDEN** **Endress+Hauser** **EVONIK INDUSTRIES**

SIEMENS **STAHL** **DSM** **rösberg** **VOGEL** **VH-Armaturen GmbH** **FLOWERVE** **Futura Solutions well integrated**

Comos Industry Solutions **RWTH AACHEN** **TURCK** **Industrielle Automation** **FESTO**

PHOENIX CONTACT **PEPPERL+FUCHS** **KROHNE** **Class.Ing**

PROLIST INTERNATIONAL
simple data integration, easy engineering

www.prolist.org

HELMUT SCHMIDT UNIVERSITÄT
Universität der Bundeswehr Hamburg

INTERGRAPH

CAE Systems' Forms

Supplier / Manufacturer

←
OLOP

→
DLOP

GENERAL	1	Tag Number		PROLISTV100BA01FT 1000				
	2	Service		Abgabemenge Schwefelsäure				
	3	P&ID No.		LE-P-0815				
	4	Area Classification	Location	Zone 1		Field		
	5	Line No.	Line Size	schedule	V100-BA01-LR001	50 mm	25	
	6	Line Internal Diameter	Pipe Material		52,3	S.S. 316L / 1.4571		
	7	Equipment No.	Pipe Class					
	8	Pipe Insulation						
PROCESS CONDITIONS	9	Fluid Name	Fluid Phase	Sulphuric Acid 98%		Liquid		
	10			Minimum	Normal	Maximum	Units	
	11	Flow		0	20	40	Nm ³ /h	
	12	Temperature		30	30	30	°C	
	13	Upstream Pressure		1	1,5	2,5	bar-a	
	14	Specific Gravity			1,86			
	15	Viscosity			0,7258		mm ² /s	
	16	Cp / Cv Isotr. Exp. Normal	Pc Critic. Pressure			bar-a		
	17	Max. Dp Permitted	Molecular Mass		bar			
	18	Foaming	Bi-Directional Flow		No	No		
	19	Entrained Gas % by Volume						
	20	Pulsating Flow						
	21	Corrosive	Erosive	Colored	Transp	Build-up		
	22	Ambient Temp : Sensor		Transmitter		30		
	23	Vibrations		Required Accuracy				
SENSOR	24	Construction Type	Enclosure					
	25	Model	Face/Face Dimension					
	26	Process Connection	Size	Flansch DIN	DN50, PN40			
	27	Nominal Size	Internal Diameter		DN50			
	28	Material	Purge Fitting					
	29	Lining	Coating					
	30	Housing Material	Distance to Transm.					
	31	Cable Entry	Cable Length					
	32	Insertion Length	Body Length					
	33	Jacket Model						
	34	Transmitter Type	Model					
	35	Instrument Range Min.	Max.					
	36	Calibration Range Min.	Max.					
	37	Power Supply	Signal/Load	Power Consump.	24V DC			

↑
Operating parameters

↓
Device specification

• • •

Specification Sheets (ISA) and Lists of Properties (PROLIST)



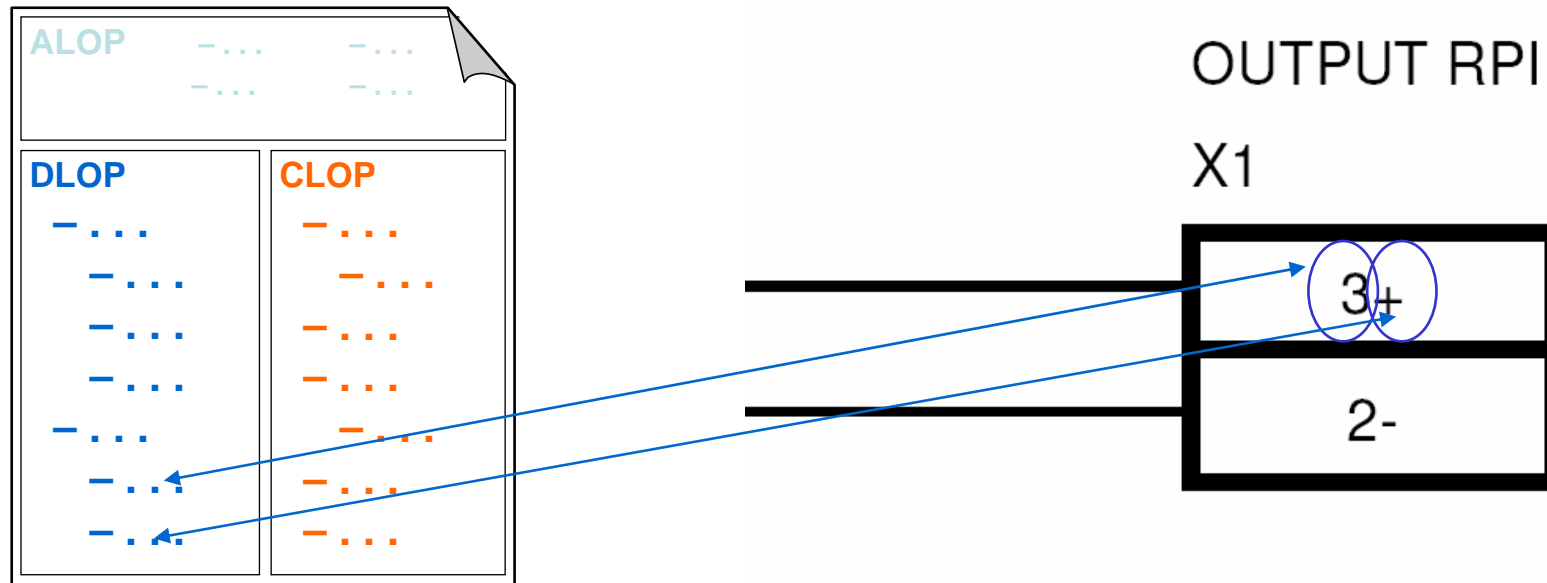
ISA TR20

NE 100

Operating Parameters:

RESPONSIBLE ORGANIZATION		FLOW DEVICE		SPECIFICATION IDENTIFICATIONS	
1	2	3	4	6	7
5	6	7	8	9	10
ADMINISTRATIVE IDENTIFICATIONS		SERVICE IDENTIFICATIONS		SERVICE IDENTIFICATIONS Continued	
11	12	40	41	42	43
13	14	44	45	46	47
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17	18	52	53	54	55
19	20	56	57	58	59
21	22	60	61	62	63
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43	44	104	105	106	107
45	46	108	109	110	111
47	48	112	113	114	115
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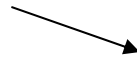
CAE relevant data for implementation of the NE 100



- Automatic transfer of description and designation of the terminals from the LOP to the loop sheet

Generation of the intrinsic safety confirmation document

CAE system



PRO-SPEC



	A	B	C	D	E	F	G	H	I	
1	20 ZABA V101 PA01 F001					20 ZABA V101 PA01 F001				
2	Durchflussmesser					Trennverstärker				
3										
4	Si-techn. Kenngrößen Ex i-Kreis - (passiv / aktiv)				Si-techn. Kenngrößen Ex i-Kreis - (passiv / aktiv)					
5		Maximale Eingangsleistung (Pi)		2	mW		Maximale Eingangsleistung (Pi)		2	mW
6		Maximale Eingangsspannung (Ui)		24	V		Maximale Eingangsspannung (Ui)		24	V
7		Maximaler Eingangsstrom (Ii)		0,5	mA		Maximaler Eingangsstrom (Ii)		0,5	mA
8		Maximale innere Kapazität (Ci)			nF		Maximale innere Kapazität (Ci)			nF
9		Maximale innere Induktivität (Li)			µH		Maximale innere Induktivität (Li)			µH
10		Maximale Ausgangsleistung (Po)			mW		Maximale Ausgangsleistung (Po)			mW
11		Maximaler Ausgangsstrom (Io)			mA		Maximaler Ausgangsstrom (Io)			mA
12		Maximale Ausgangsspannung (Uo)		24	V		Maximale Ausgangsspannung (Uo)		24	V
13		Maximale äußere Kapazität (Co)			nF		Maximale äußere Kapazität (Co)			nF
14		Maximale äußere Induktivität (Lo)			µH		Maximale äußere Induktivität (Lo)			µH
15		Max. äußeres Induktivitäts-/Widerstandsverhältnis (Lo/Ro)			µH/Ohm		Max. äußeres Induktivitäts-/Widerstandsverhältnis (Lo/Ro)			µH/Ohm
16										
17						Zusammenschaltung				
18						OK				
19										
20										

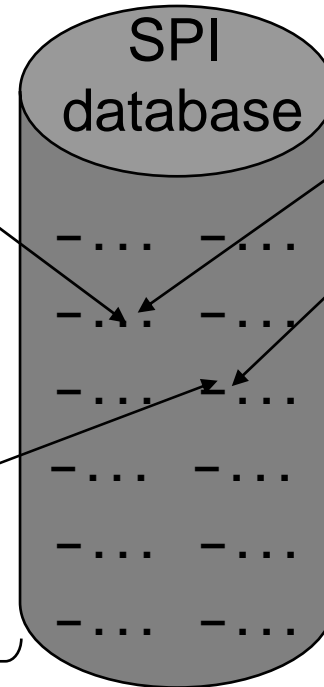
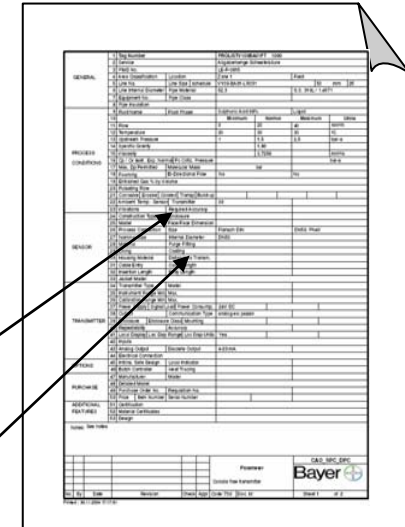
What does one need in a CAE system for implementing the NE 100 interface

Supplier / Manufacturer

Visualization of the **entire** LOP sent to and received from supplier in SPI

Customer SPI sheet (or ISA TR20 sheet)

Device list of properties of coriolis mass flowmet...	
Device data	
Equipment identification code	
Identification	
Manufacturer name	ENDRESS+HAUSER
Supplier	
Manufacturer product name	PROMASS
Manufacturer product type	83 F
Manufacturer product code	83F25-AD25AADAAABA
Article number	
EAN code	
ERP system inventory number	
Software version	
Hardware version	
Serial number	
Electronic insert	
Device tag plate	
Tag plate language	
Number of text lines	
Text line	
Text color	
Tag plate height	
Tag plate width	
Tag plate thickness	
Tag plate color	
Tag plate material	
Tag plate mounting style	
Application	
Application description	
Function and system design (1)	
Measuring principle	Coriolis principle

Already exists in SPI

Mapping

Report

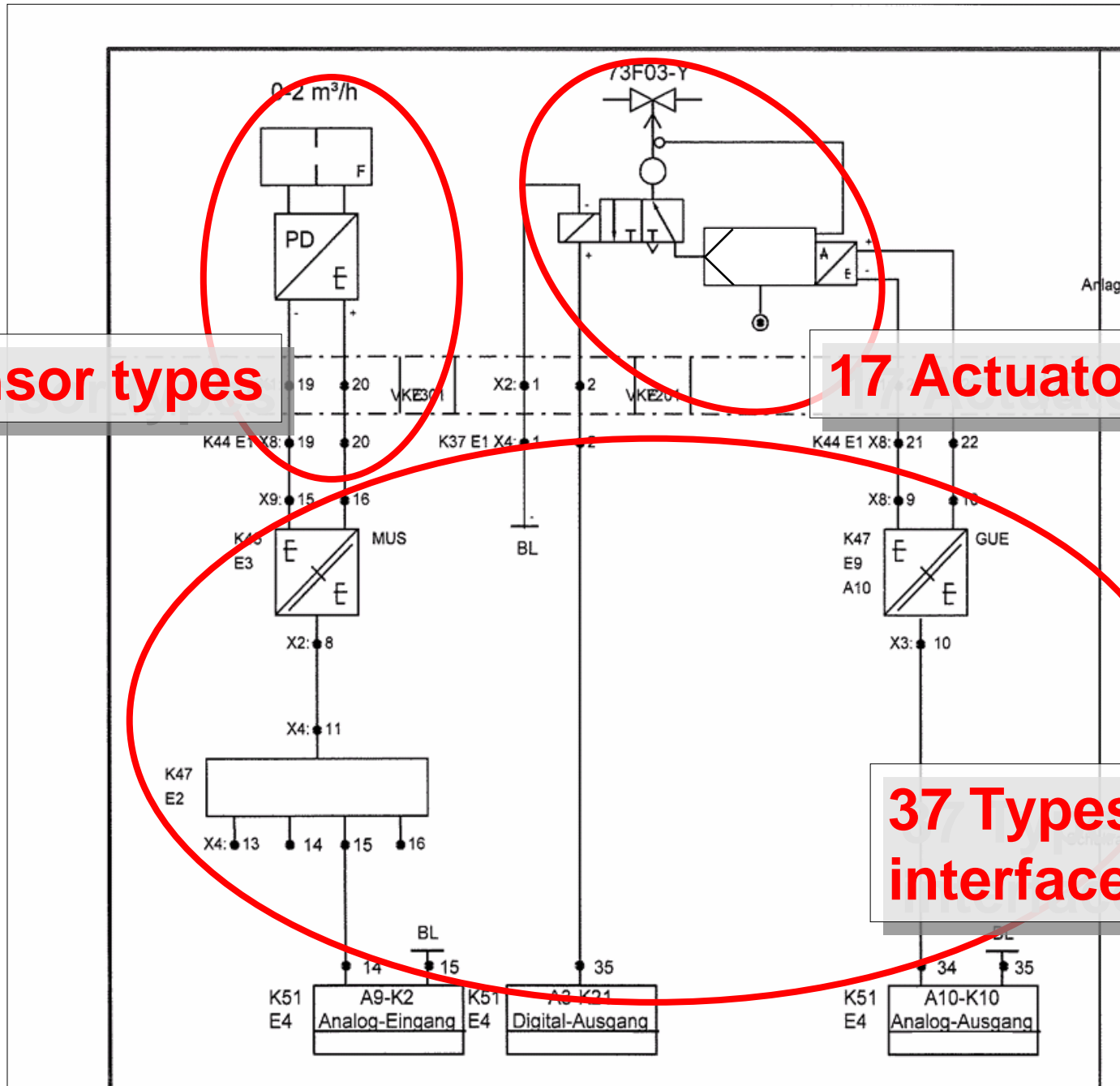
A mapping tool is needed for the implementation of the NE 100 interface

(only for a subset of the received LOP)

Availability of LOPs and appropriate tools

- CAE systems with implemented NE 100 interface:
 - PRODOK
 - SmartPlant Instrumentation (in progress)
 - Comos (in progress)
 - other CAE system manufacturers are already talking with PROLIST
- Other available tools for the handling of LOPs
 - PRO-SPEC (creating, reading and comparing of LOPs in XML files and other functions)
 - PRO-VIEW (only reading of LOPs in XML files)

Which LOPs are already available?

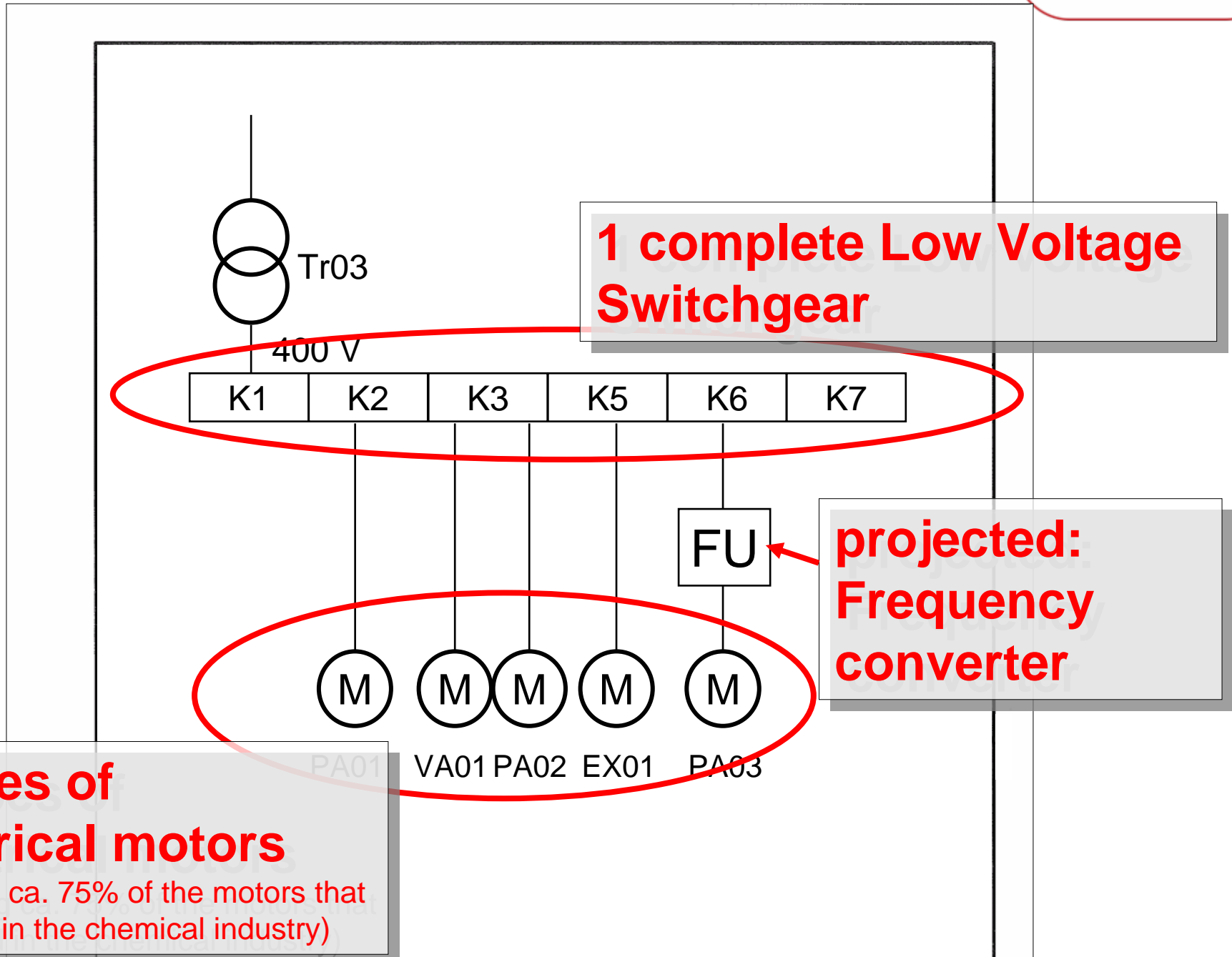


51 Sensor types

17 Actuator types

37 Types of interface devices

Which LOPs are already available?



Main benefits for equipment users by utilizing PROLIST Lists of Properties



- Optimization of the integration of data from planning, purchasing, and commissioning through to maintenance
- Streamlining the engineering process
- No need to enter master data into your own CAE system
- Reduction of transaction costs (5 - 15%)
- Major improvement in data quality, i.e. virtually error-free device data (no manually caused input errors)
- Reduction of effort as regards creation (investment) and maintenance of the plant documentation (maintenance)
- Improved comparability of device data in offers

Review of Key Points

- We have shown how through the use of the LOP technology
 - the engineering process can be simplified,
 - the plant documentation quality can be raised and
 - the costs in engineering and procurement can be reduced
- Major benefits:
 - simple integration of process control equipment data in one's own CAE system
 - avoidance of expensive, inflexible and error-prone manual data input
- The key benefits has been proven:
 - Simplifying the engineering process
 - Raising the plant documentation quality
 - Reducing the costs in engineering and procurement

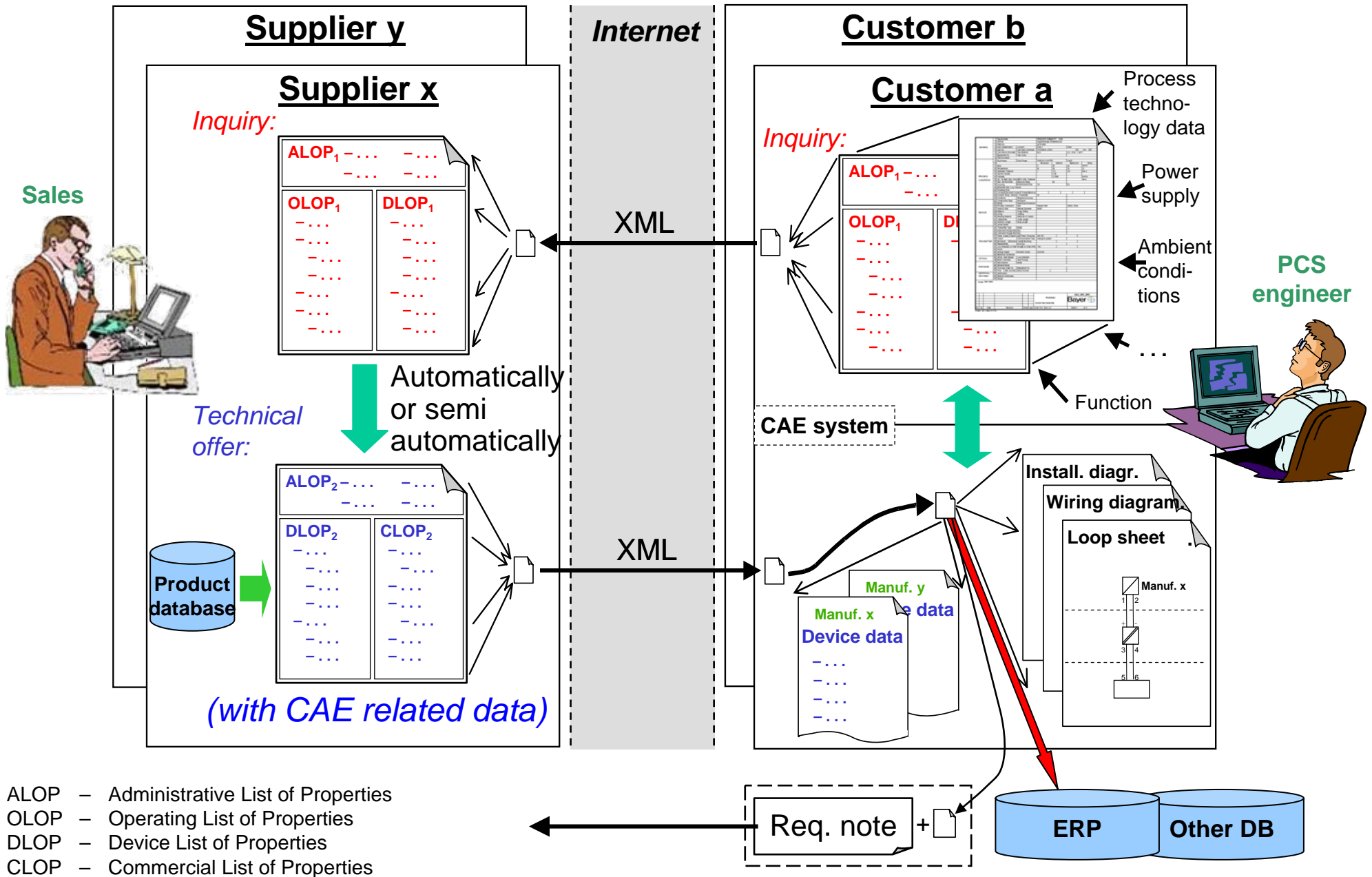
Q & A

- Any questions about the topics covered?

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Back up slides

Core engineering workflow of PROLIST



Key role of CAE systems

- For the practical applications of LOPs according to IEC 61987-10, CAE systems play a decisive role on the customer side. They support and increase the efficiency of the work.
- One important condition is that all documents in the form of a transmission files, for example, should be capable of being exported from and imported to the system. It should also be possible to import CAE-relevant data such as terminal designations. The CAE systems should be capable of automatically accepting the master data of a new device type. Another important factor is the ability to compare the technical device data from several offers in the same CAE system.