Conference Theme and Keywords

The PI System: Enabling a Digital Factory

Presented by **Michael Pelz**

Process Optimization – Automation (Operations Support & Technology)

CLARIANT

Topics

- Clariant Plastics & Coatings Deutschland GmbH
- Industrie 4.0
- PIMS Project -> OSIsoft PI System
- Harmonized flexibility!
- Next Steps
- Summary

Clariant
Plastics & Coatings (DE) GmbH

Clariant at a glance

A GLOBALLY LEADING COMPANY IN SPECIALTY CHEMICALS

5807
Sales 2015 (CHF m)
from continuing operations

227
Net result 2015 (CHF m)
from continuing operations

4
Business Areas

853
EBITDA 2015 (CHF m)
before exceptionals

14.7%
EBITDA margin 2015
before exceptionals

110 in companies **53** countries

17213
Employees 2015

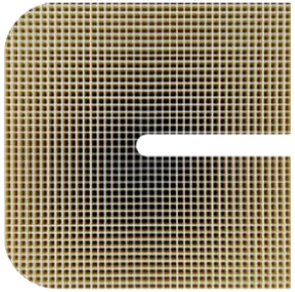
Clariant at a glance

Four Business Areas – the right portfolio for future growth

BU Pigments

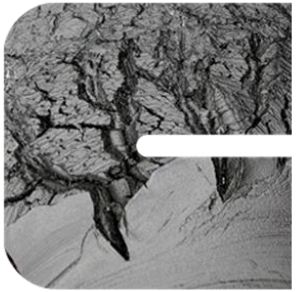
Care Chemicals

SALES (CHF m)	**1 445**
EBITDA (CHF m)	**272**
EBITDA margin	**18.8 %**



Catalysis

SALES (CHF m)	**704**
EBITDA (CHF m)	**177**
EBITDA margin	**25.1 %**



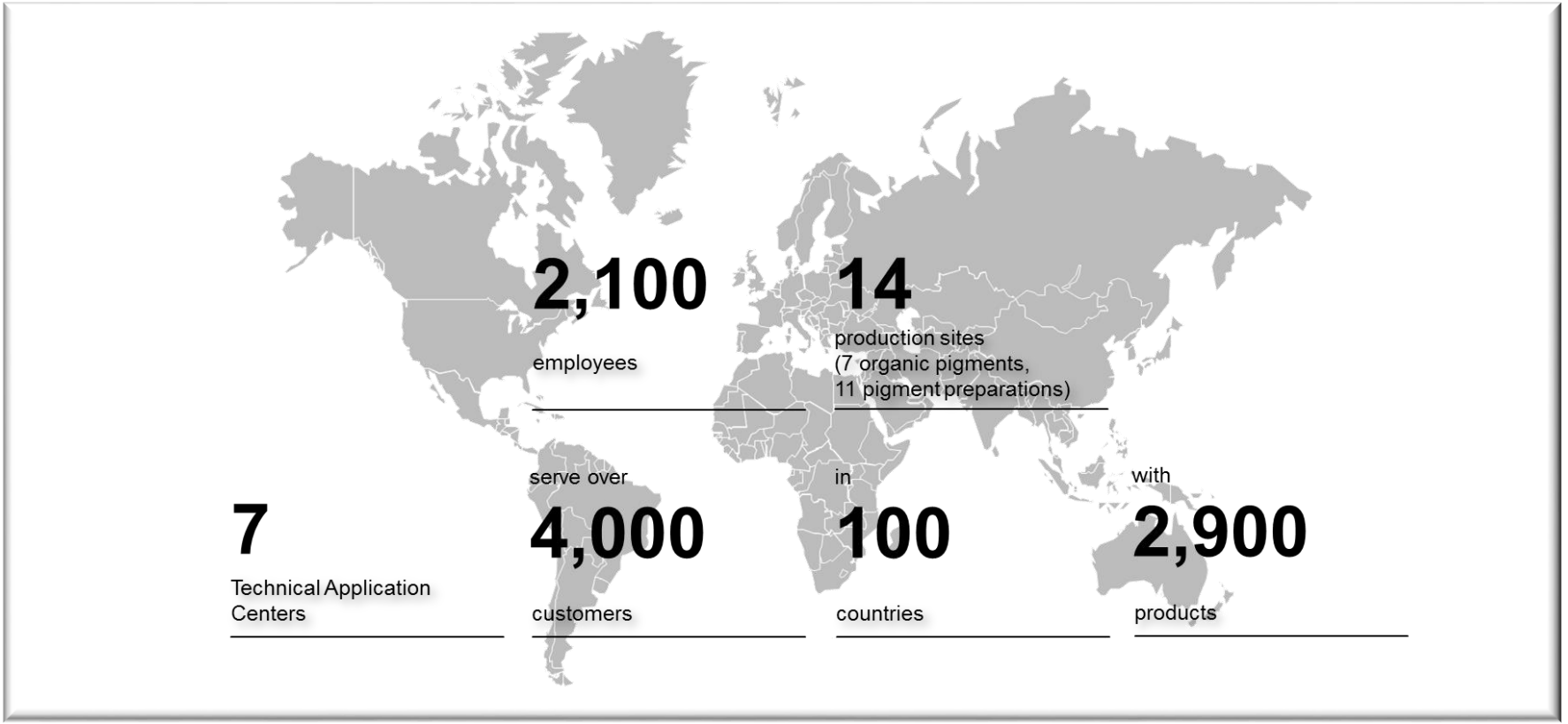
Natural Resources

SALES (CHF m)	**1 217**
EBITDA (CHF m)	**206**
EBITDA margin	**16.9 %**

Plastics & Coatings

SALES (CHF m)	**2 441**
EBITDA (CHF m)	**313**
EBITDA margin	**12.8 %**

BU Pigments at a glance



BU Pigments, you find us here

SEGMENTATION – OUR FOUR STRATEGIC BUSINESS SEGMENTS

Coatings	Printing/NIP	Plastics	Special Applications
 Automotive	 Specialty Inks	 Masterbatch	 Personal Care & Home and Fabric Care
 Decorative	 Color Filter	 Processors (PVC)	 Stationery

Industrie 4.0

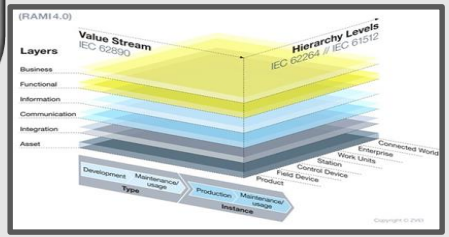
Digital Buzzwords

Global Communication

Cloud-Systems

Industrie 4.0

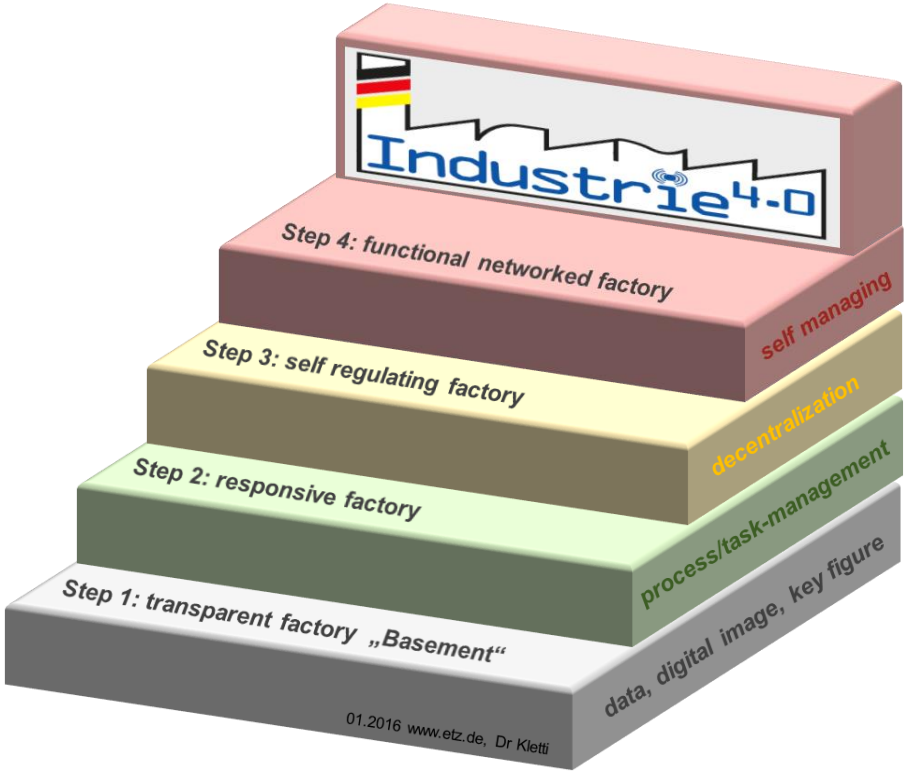
INTERNET of THINGS



I4.0 Modelling (ZVEI)

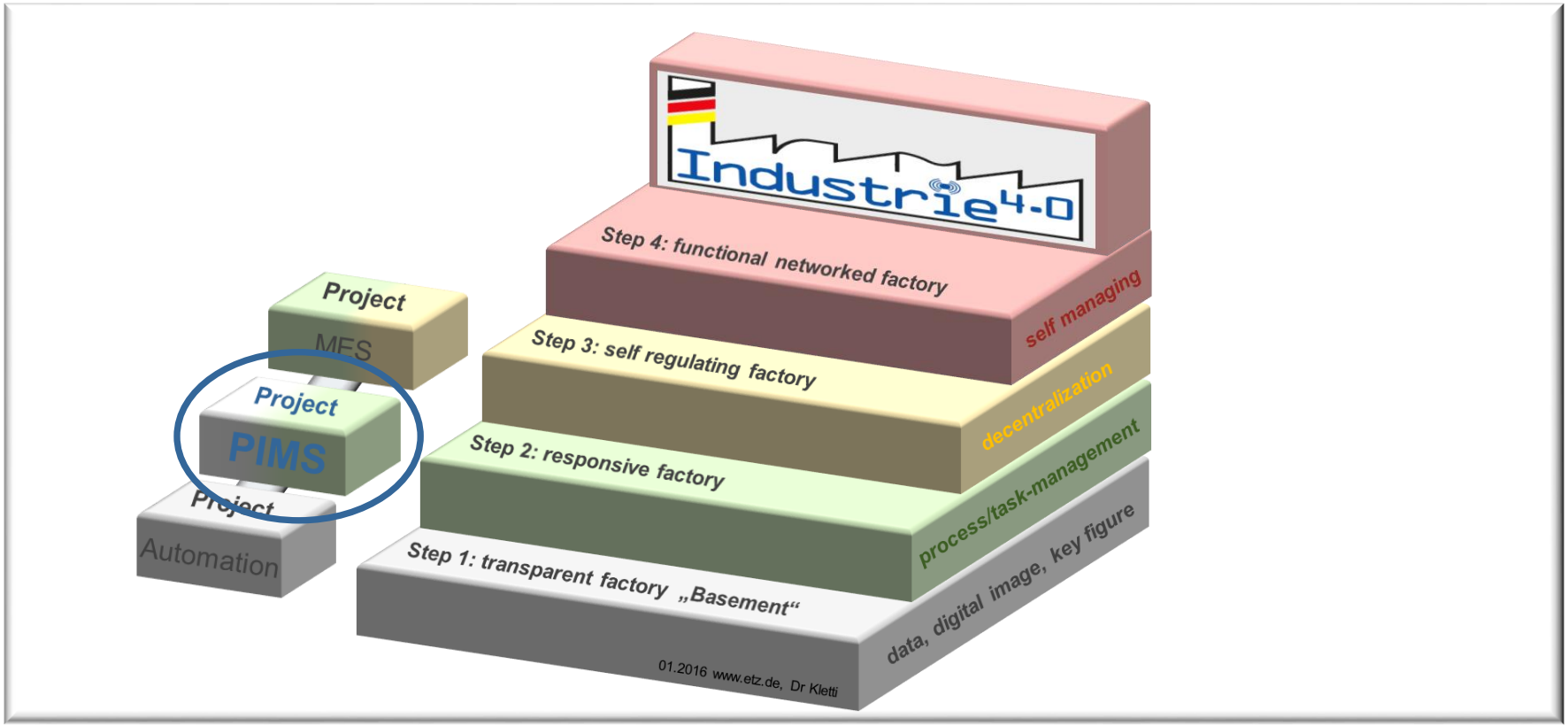
What is precious to I4.0

Steps to I4.0

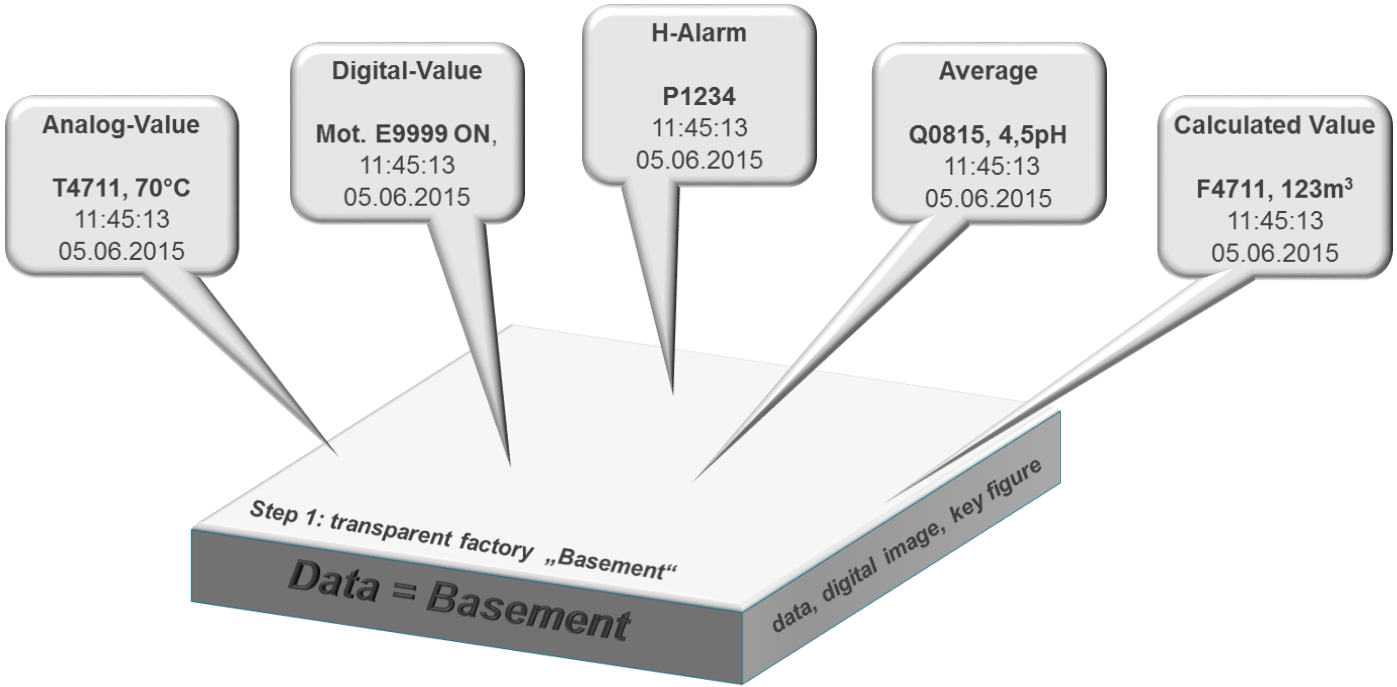


BU Pigments: Transparent Factory

Strategy trend



First Step: Transparent Factory
„Basement“

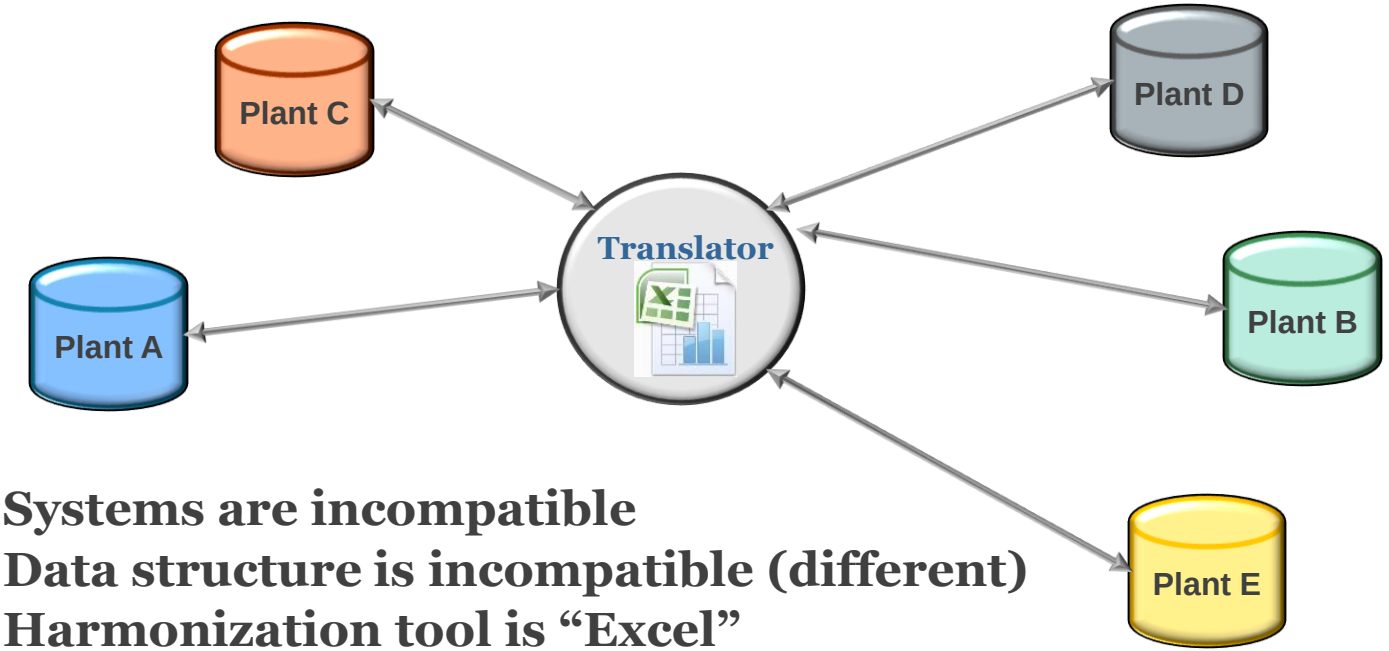


- **Which data do we have in which spot?**

PIMS Project -> OSIsoft PI System

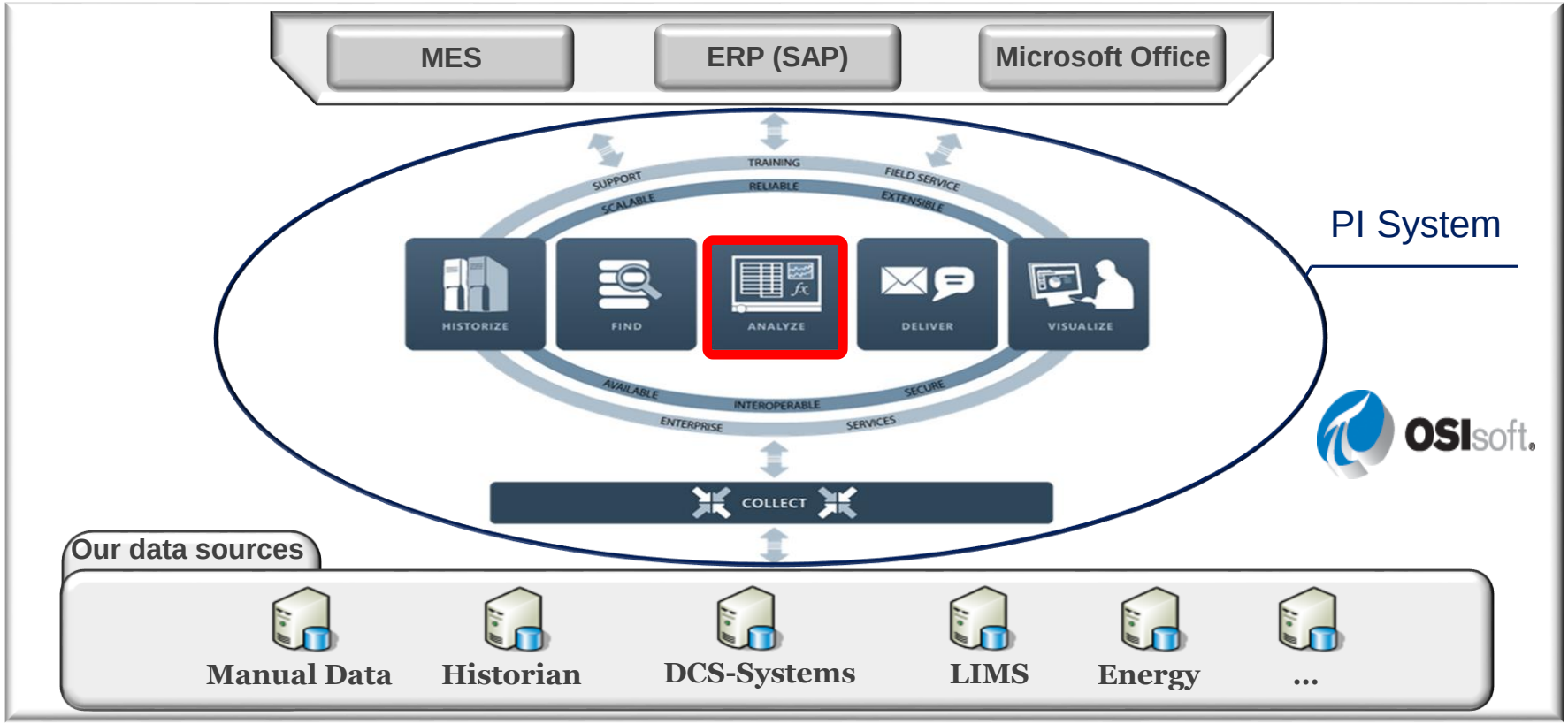
Which data do we have in which spot?
Current Example

Different existing single historian systems



- Systems are incompatible
- Data structure is incompatible (different)
- Harmonization tool is “Excel”

Project: PIMS implementation -> OSIsoft PI System
(Process Information Management System)



What is a PI System?

Compare a PI System with a modern Office-PC

Office PC:

What is a PI System?

Compare a PI System with a modern Office-PC

Office PC:

Standard-Tools:
- Operating system, Win xx
- Excel
- Word
- Outlook
- …

Data archiving:
- Hard disk
- Memory stick
- Network

Interfaces:
USB, VGA, HDMI,

But only “we” can do useful things with it!

What is a PI-System?

Compare a PI-System with a modern Office-PC

PI-System:

Standard-Tools:
- Operating system PI
- Data Link
- ProcessBook
- Coresight
- …

Data archiving:
- Experienced in managing “Big Data” for 30+ years
- Enterprise architecture

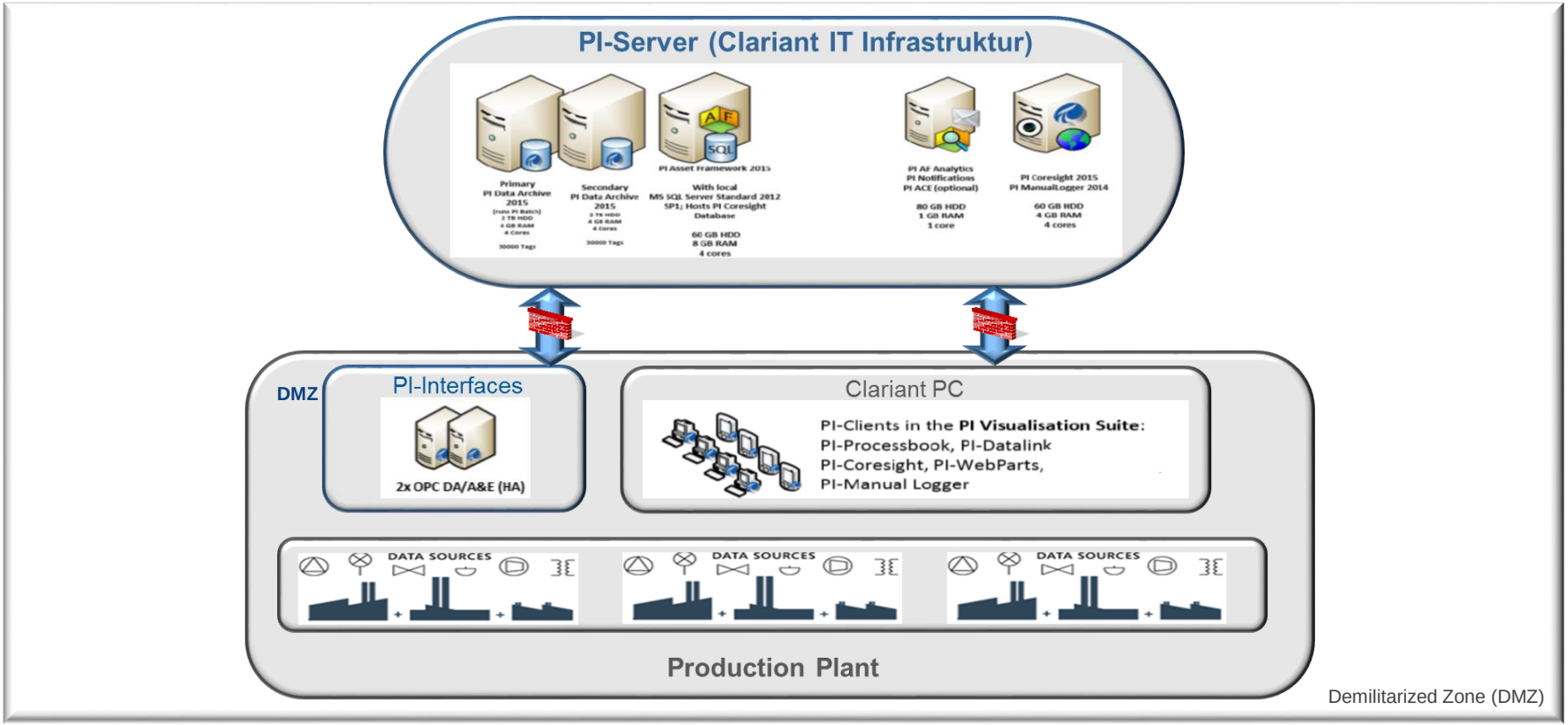
Interfaces:
> 450 interfaces included

But only “we” can do useful things with it!

Implementation Details

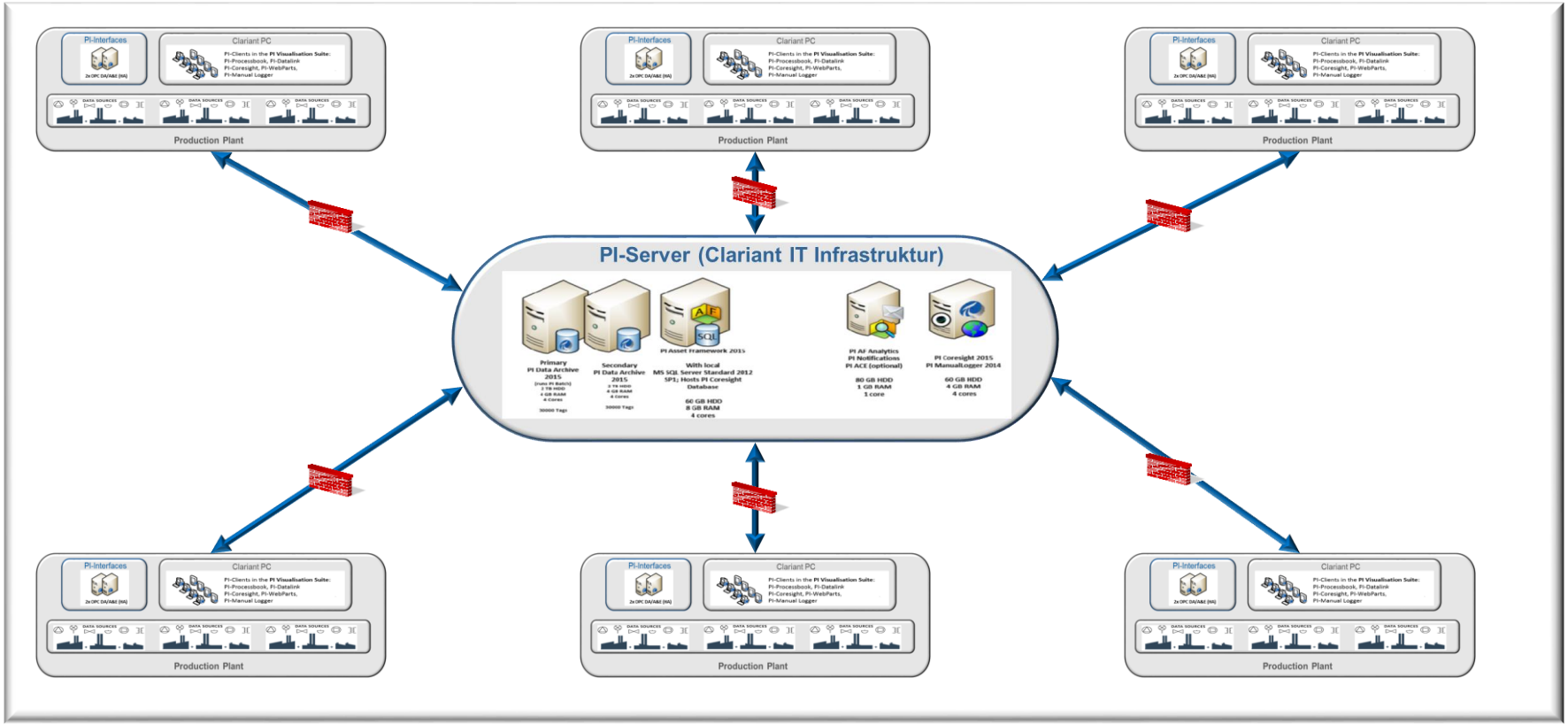
Project: PIMS implementation -> OSIsoft PI System

System architecture



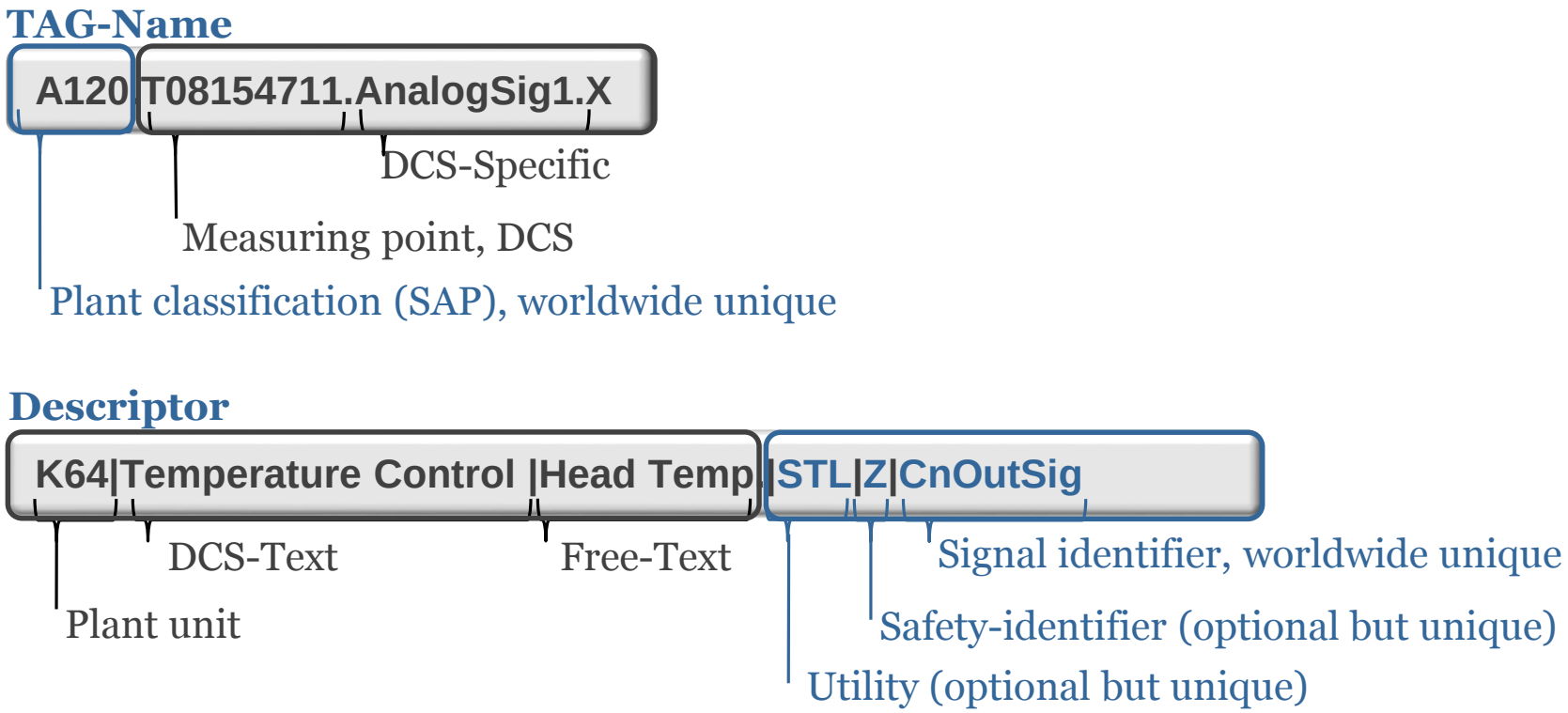
Project: PIMS implementation -> OSIsoft PI System

System architecture



TAG Structure

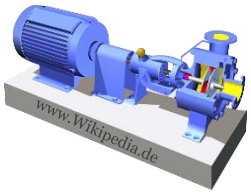
the harmonized flexibility!



TAG-Structure

Template example: motors

Standard-Motor (4 TAG´s):



- Input signal (activation)	+ Signal-Identifier (e.g. M1OnSig)
- Current consumption	+ Signal-Identifier
- Operating mode (manual/auto)	+ Signal-Identifier
- Operating hours counter	+ Signal-Identifier

On/Off Valve (6 TAG´s):

- Input signal (activation)	+ Signal-Identifier
- Feedback close	+ Signal-Identifier (eg. DvFbCloseSig)
- Feedback open	+ Signal-Identifier
- Current consumption	+ Signal-Identifier
- Operating mode (manual/auto)	+ Signal-Identifier
- Operating counter	+ Signal-Identifier

TAG-Structure
Alarms, Warnings, Messages

- **Uniform definition for the alarm prioritization**

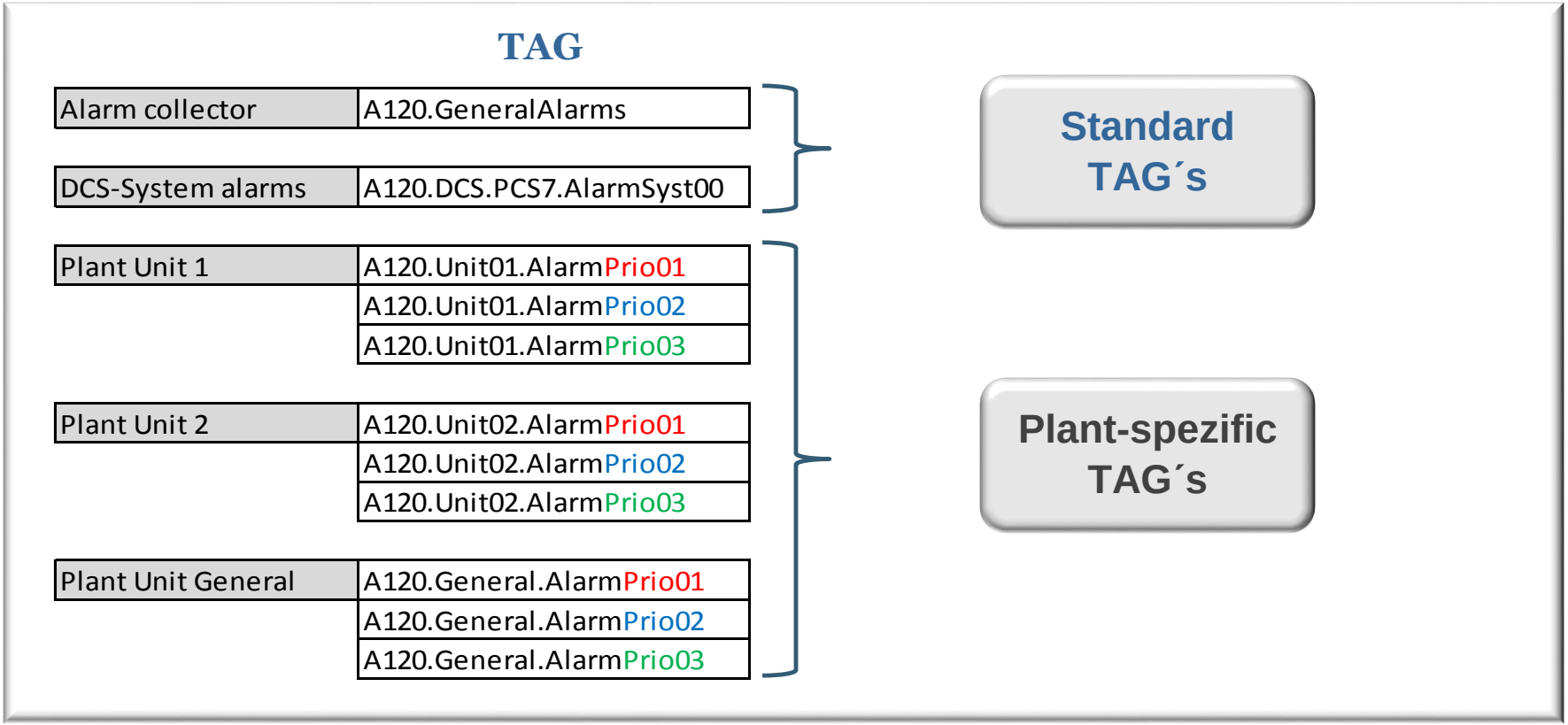
  All alarms, warnings, messages archived in the PI System have to be prioritize (1, 2, or 3), in order to generate effective, consistent and cross-company reports!

  Alarm (high) / Warning (medium) / Message (low)

  - Prio 1, (high) -> per Plant section all Alarms are archived into one PI-TAG
  - Prio 2, (medium) -> per Plant section all Alarms are archived into one PI-TAG
  - Prio 3, (low) -> per Plant section all Alarms are archived into one PI-TAG

TAG-Structure

Alarms, Warnings, Messages, harmonized flexibility!

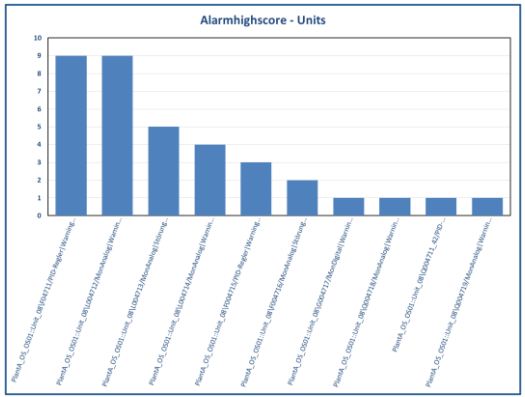


Alarm evaluation Tool
applicable for all plants

- **Alarm Analysis Tool** (Alarm Highscore)
  - Plant-report for the most frequent alarms
    - Report Plantwide
    - Report per plant unit
    - Report DCS-Systemalarms

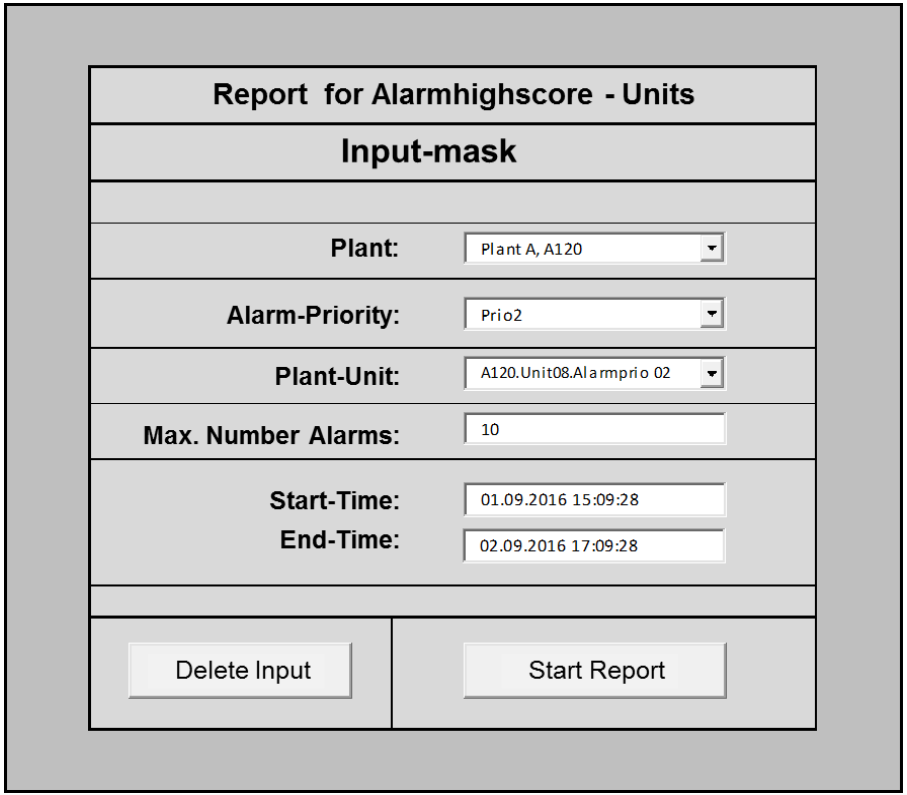
⇨ Basic concept to minimize alarms

Pilot version is available!



spira tec

Alarm Analysis Tool
Input mask



Alarm Analysis Tool
Alarm high score

Report for Alarmhighscore-Units

Plant A, A120

Unit : A120.Unit_08.AlarmPrio02

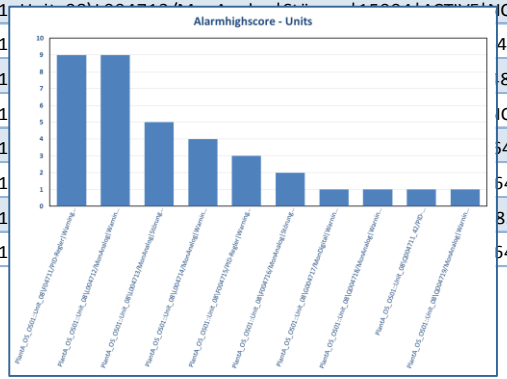
Alarm-Priority: Prio2

Max. Number Alarms: 10

Start-Time: 01.09.2016 15:09:28

End-Time: 02.09.2016 17:09:28

Source	Description	Condition	Severity	Count
PlantA_OS_OS01::Unit_08\F04711/PID-Regler|Warning High|-2147483648|ACTIVE|NOT ACKED|ACKREQD	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	9
PlantA_OS_OS01::Unit_08\L004712/MonAnalog|Warning High|-2147483648|ACTIVE|NOT ACKED|ACKREQD	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	9
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Störung	625	5
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning Low	625	4
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning Low	625	3
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Störung	625	2
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	1
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	1
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	1
PlantA_OS_OS01	Unit_08 Alarm Tag for Priority 2 Alarms	Warning High	625	1



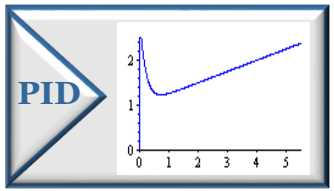
Next Steps

PID-Controller evaluation tool
applicable for all plants

- **PID-Controller evaluation Tool** (Highscore)
  - Plant-report for the suboptimal configured controllers
  - Plant wide or per plant unit

Basic concept for controller optimization,
or later APC (Advanced Process Control),

Next Step!



Asset Framework-Implementation
first step

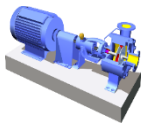
S88 Modell: Enterprise / Site / Area / Process Cell / Unit

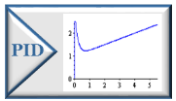
BU Pigment Modell (Draft):

- **Enterprise:** BU Pigments
- **Site:** SAP Key (A4711)
- **Unit:** Descriptor Plant Unit (e.g.K64)

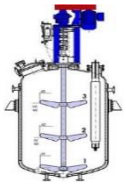
First version is available!

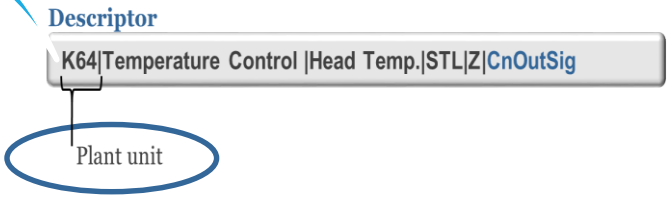

www.samson.de



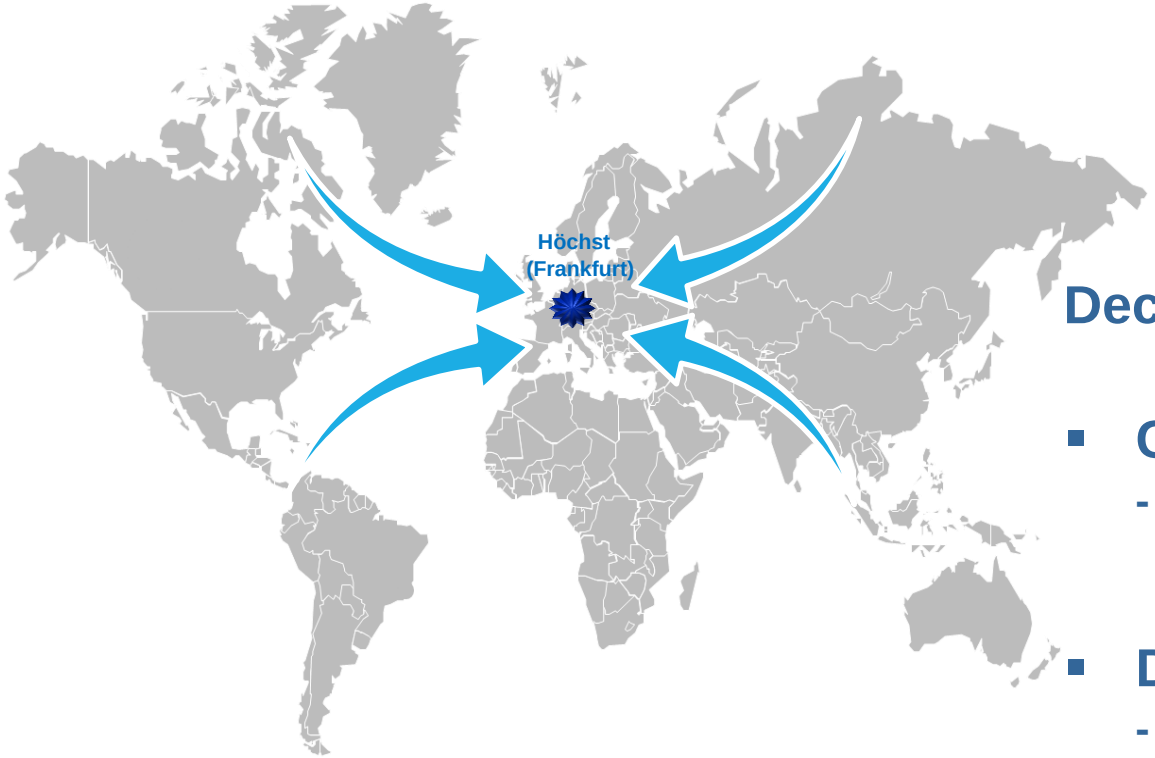



www.pfeiffer-armaturen.com





Next Steps
Connect plants globally



Decision between:

- **Centralized System**
  - **- Bandwidth for data traffic?**
- **Decentralized System**
  - **- Infrastructure worldwide?**

Next Steps
Teamwork

Clariant
Operations Support &
Technology

OSIsoft / 3rd party

Clariant IT

… and a bit of luck!

InnovationTeam-WaterRing.jpg

Summary

Summary Slide

COMPANY and GOAL

Clariant Plastics & Coatings Deutschland GmbH

1) BU Pigments, a world full of colors
2) Discover Value, for ourselves, for our clients, for our shareholders, and for the world around us

CHALLENGE

What is the first step to an Digital Factory?

- Which data do we have on which place?
- How we can handle data effective from several plants?

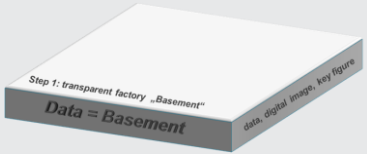
SOLUTION

Implementation from the PI System as Basement for a Digital Factory!

- System Implementation in collaboration wit IT
- Global TAG standardization, but flexible enough for the different production plants

RESULTS

Start small, but think global!



- Standardized flexibility is possible
- Implemented reports applicable across our plants
- Easy to handle (PI Datalink, PI ProcessBook, PI Coresight), high acceptance

Contact Information

Michael Pelz

Michael.pelz@Clariant.com

Process Optimization – Automation

(Operations Support & Technology)

Clariant Plastics & Coatings
Deutschland GmbH

Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

Complete the Online Survey for this session

http://ddut.ch/osisoft

감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado