

PI and Visual Computing the next generation of process analytics

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Refractories

Indispensable for Industrial High-Temperature Processes

Refractory Products



Bricks



Mixes



Linings

- Ceramic refractory products are used in all **high-temperature industrial processes** ($>1,200^{\circ}\text{C}$) since they protect the production units/furnaces against **thermal** (and also **mechanical** and **chemical**) stress
- **Base materials** are Magnesite and Dolomite (melting point of fused magnesia above $2,800^{\circ}\text{C}$)



Magnesite



Dolomite

High temperature production processes



Steel production



Cement / lime production



Glass production



Nonferrous metals production

RHI Magnesita is a vertically integrated global provider of high-grade refractory products, systems and services, which are indispensable for industrial high-temperature processes exceeding $1,200^{\circ}\text{C}$

RHI Magnesita at a glance

14,000
Employees

€3.1bn
2018 revenue

1,700
Global Patents
and patent
applications held

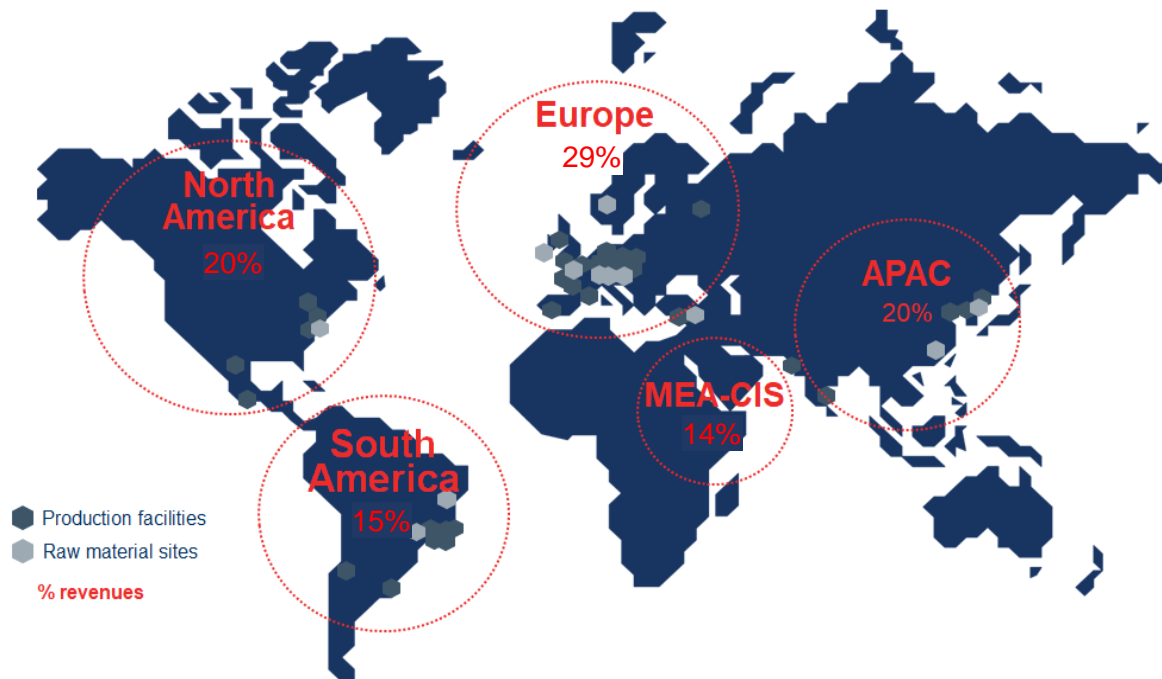
35
Main
production and raw
material sites

100
Countries
shipped to
Worldwide

70
Sales Offices

120,000
Individual
products

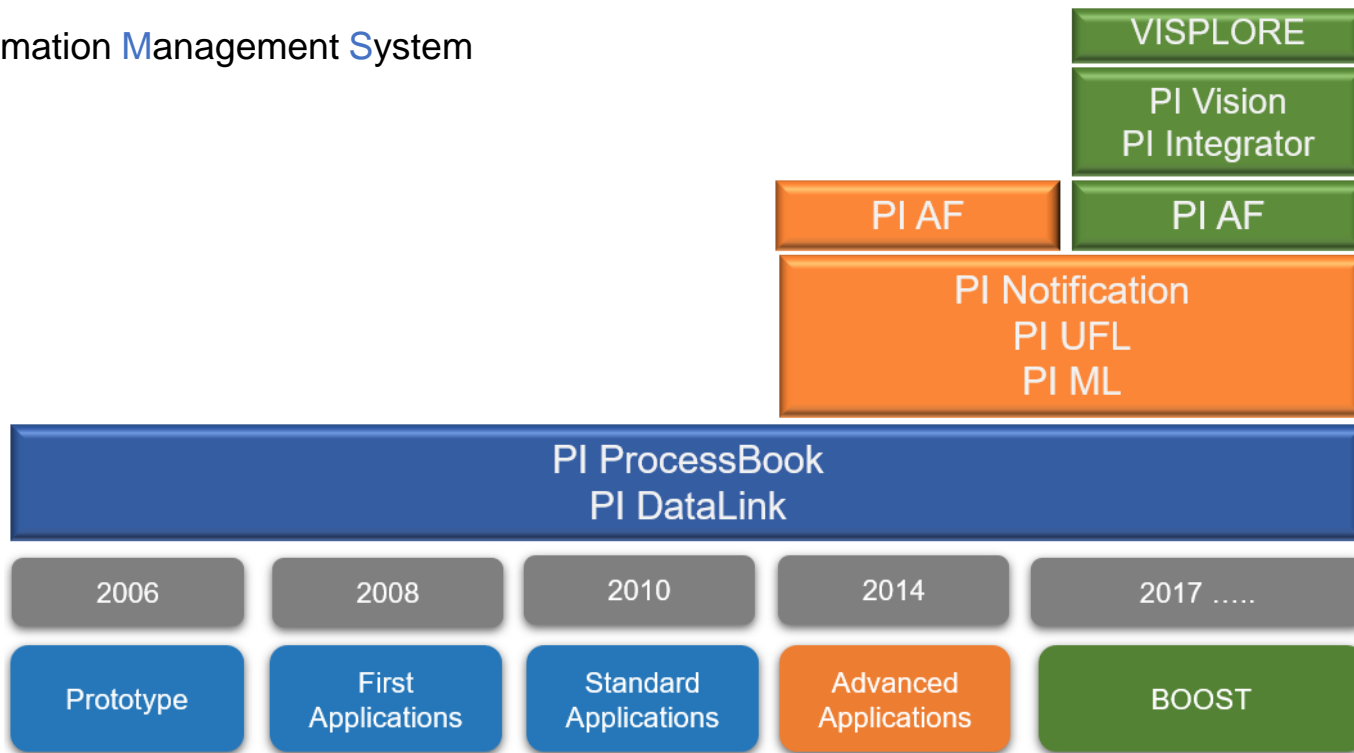
€63m
Investment in
R&D and
Technical
Marketing



What do we use PI for ?

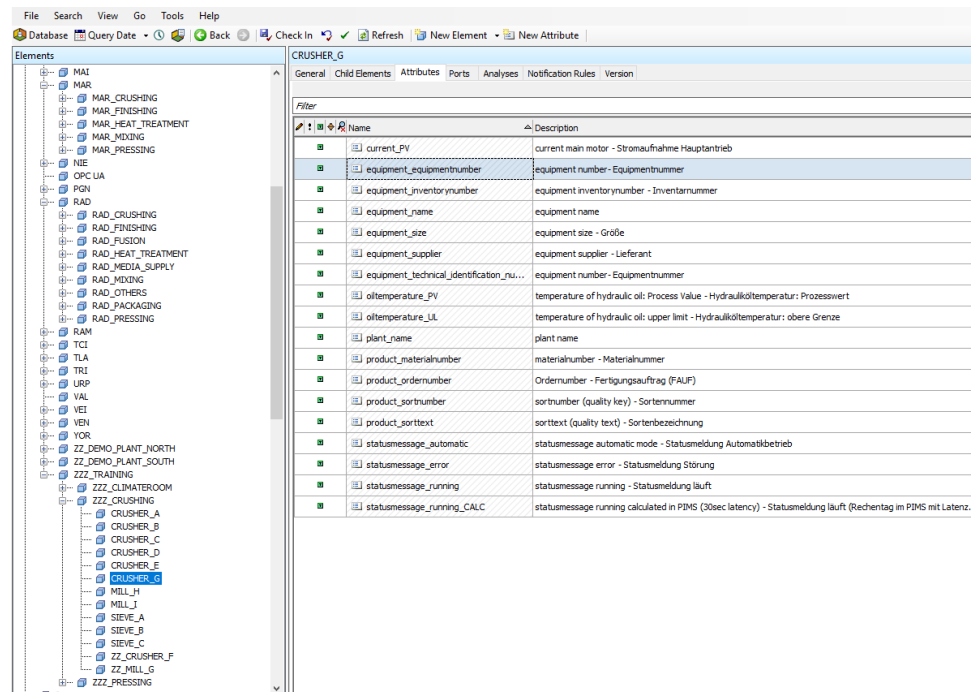
PIMS – the next generation

Process Information Management System



Improvements – Example PI AF

- Templates bring standards to our tags
- Easy to administrate
- PI Analytics replace Performance Equation
- Available in all PI Tools and VISPLORE
- ...



Name	Description
current_PV	current main motor - Stronaufnahme Hauptantrieb
equipment_equipmenumber	equipment number - Equipmentnummer
equipment_inventorynumber	equipment inventorynumber - Inventarnummer
equipment_name	equipment name
equipment_size	equipment size - Größe
equipment_supplier	equipment supplier - Lieferant
equipment_technical_identification_nu...	equipment number - Equipmentnummer
oiltemperature_PV	temperature of hydraulic oil: Process Value - Hydrauliköltemperatur: Prozesswert
oiltemperature_UL	temperature of hydraulic oil: upper limit - Hydrauliköltemperatur: obere Grenze
plant_name	plant name
product_materialnumber	materialnumber - Materialnummer
product_ordernumber	Ordernumber - Fertigungsauftrag (FAUF)
product_sortnumber	sortnumber (quality key) - Sortennummer
product_sorttext	sorttext (quality text) - Sortenbezeichnung
statusmessage_automatic	statusmessage automatic mode - Statusmeldung Automatikbetrieb
statusmessage_error	statusmessage error - Statusmeldung Störung
statusmessage_running	statusmessage running - Statusmeldung läuft
statusmessage_running_CALC	statusmessage running calculated in PIMS (30sec latency) - Statusmeldung läuft (Rechenzeit im PIMS mit Latenz...

Increase user's acceptance for working with their data

Improvements – Example PI Vision

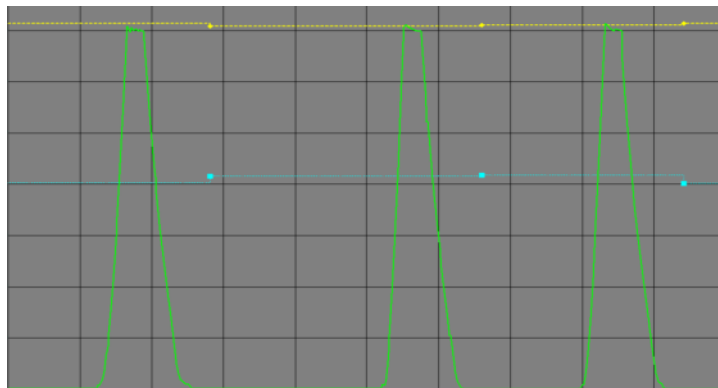
- Centrally standardized version
- Collections allow same settings
- Performance and appearance
- Easy to administrate
- Integration of PI AF
- No installation on clients
- Mobile devices
- ...



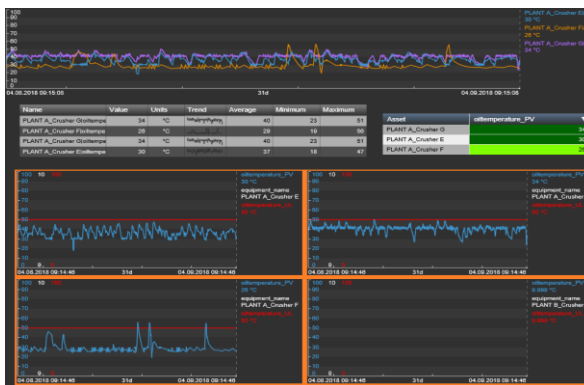
One central Dashboard for all user

Example of standard application

Live trend in Process Book



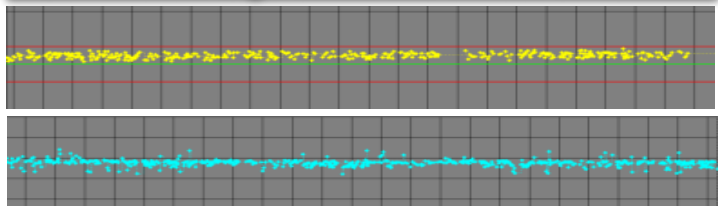
Improved Visualisation in PI Vision



What's about:

- Advanced statistics (per categories)
- Outliers
- Benchmarking
- Longtime
- ...

Calculated tags show the actual situation

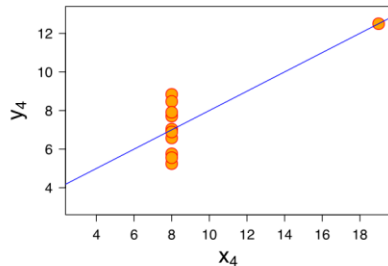
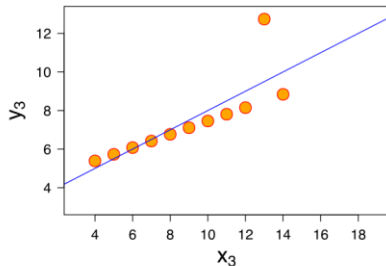
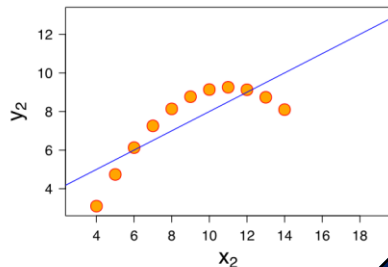
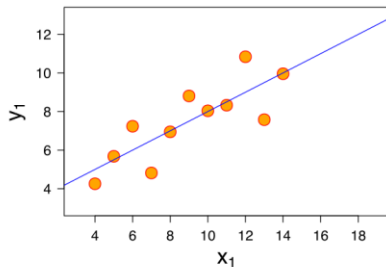


Statistics (Excel functionality)

	2017-Q2	2017-Q3	2017-Q4	2018-Q1	2018-Q2
ok	96,2	97,5	98,8	99,6	99,8
P low	0,0	0,0	0,1	0,0	0,0
P high	3,6	2,2	1,1	0,3	0,2
T low	0,2	0,3	0,0	0,1	0,1

What is Visual Computing?

Single Data



<https://de.wikipedia.org/wiki/Anscombe-Quartett>

VISPLORE

Reports & KPIs

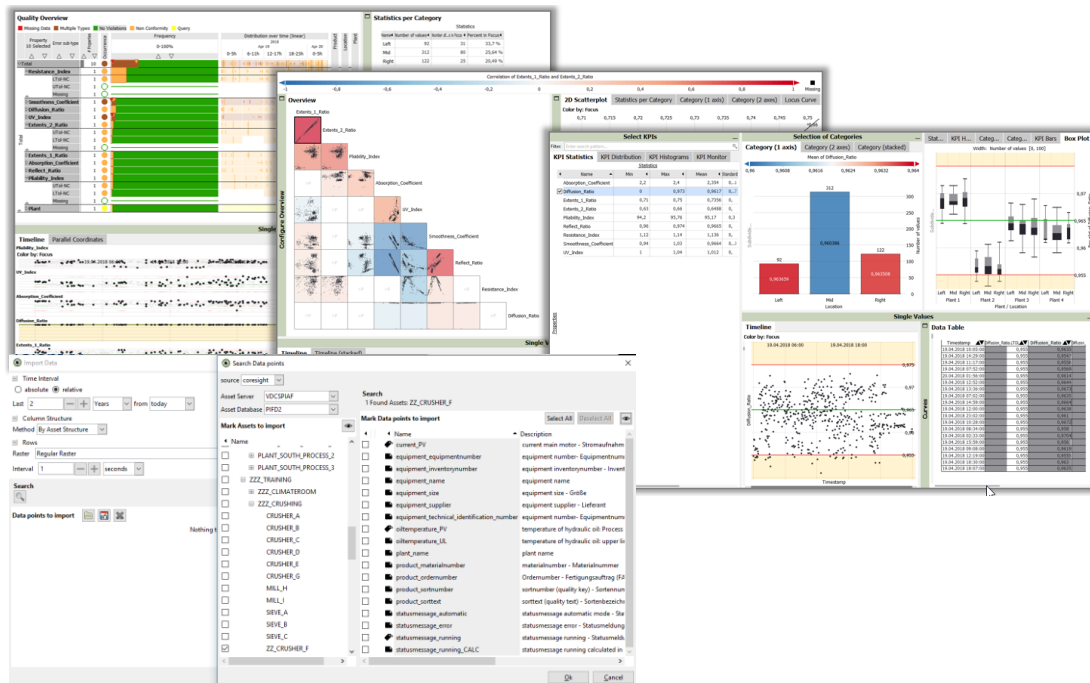
linear regression	$4997x + 3,0025$	
linear correlation	0,67	
	X	Y
AVG	9,0	7,5
STDEV	3,32	2,03

<https://de.wikipedia.org/wiki/Anscombe-Quartett>

Human intuition and creativity are essential

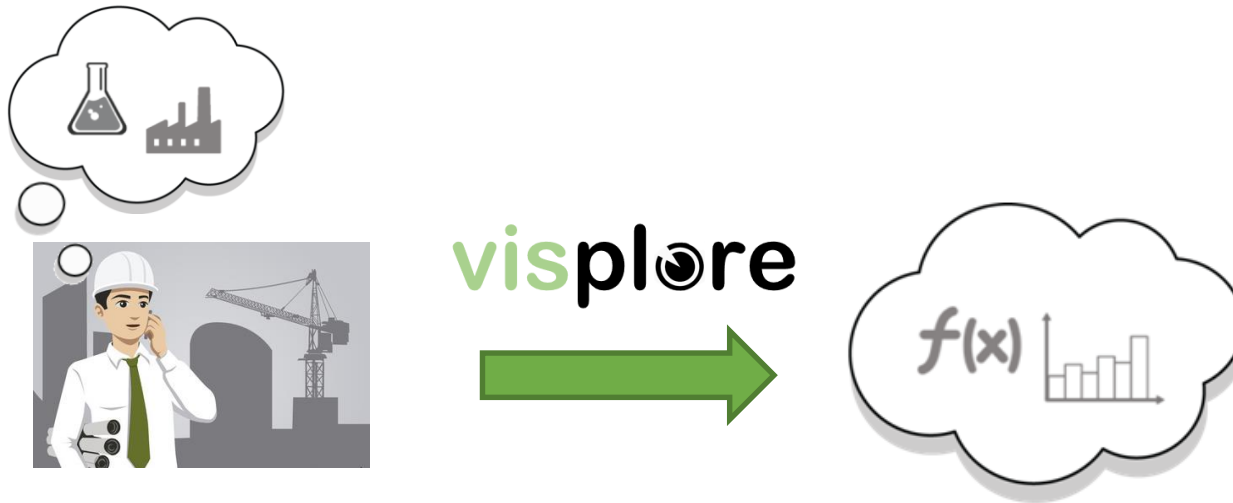
Improvements – Interface to VISPLORE

- Speed & flexibility
- Easy to handle – internal expertise & trainings
- Predefined Dashboards - dynamically configurable views
- Cooperation with Austria's leading center for Applied Research for Interactive Data Visualization
- International awarded visualization techniques
- **Direct Import of PI AF and PI Tags**



Empowering our experts to drive forward innovation and optimizations

Visplore brings data science to engineers

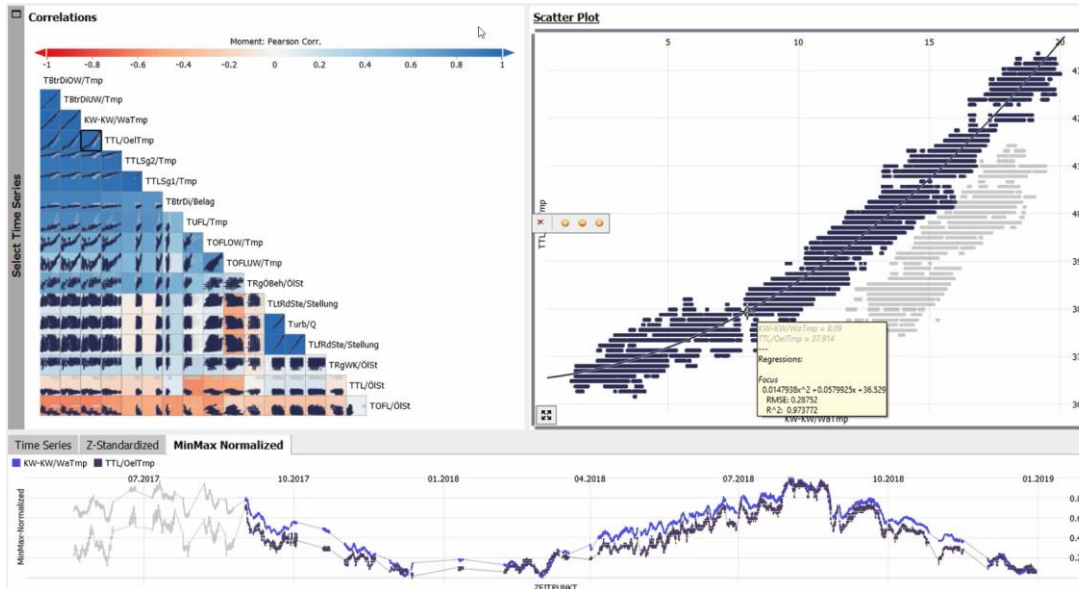


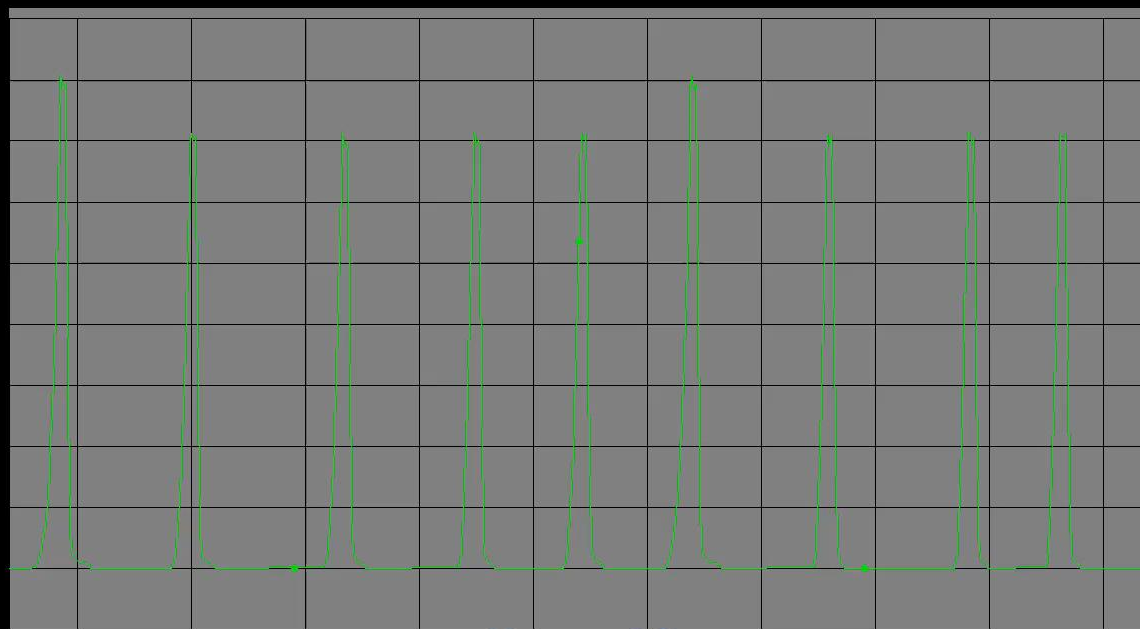
... enables engineers also without data science background
to turn process data into added value.

Visplore brings data science to engineers

Typical Use Cases for Analyzing Timelines

- Data Cleansing and Preparation
- Key Figures and Trend
- Cycle Time Analysis
- Comparison of Periods
- Regression
- Asset comparison
- Product Quality Analytics
- Anomaly Detection
- Batch
- ...





CHALLENGES

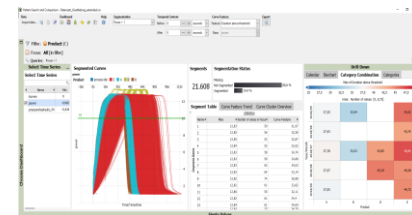
- Full potential of process data is not exploited
- Time-consuming and too complicated

SOLUTION

- Standardized PI-AF structure
- Tools to give process experts an easy access to their data

BENEFITS

- Increase data usage
 - Easy access & tools
 - Clear structure
 - Save expert time
- => Simplify data driven decisions**



“

With these new tools and solutions I really can save immense time and focus on solving my problems efficiently... I found already high potentials for improvements in my processes

”

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Questions?

Please wait for
the **microphone**

State your
name & company



Please remember to...

Complete Survey!

Navigate to this session in
mobile agenda for survey

