

AVEVA PI WORLD

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# Best Practices on Standardizing PI Data and Empowering Plant Workers to Boost OEE

Presented By:

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**AVEVA**



# Our Business Areas

## Crop Science



// Innovative chemical & biological crop protection, seeds & traits, digital technologies & services

## Pharmaceuticals



// Prescription products for cardiology, women's health care, oncology, hematology, ophthalmology, radiology and other areas

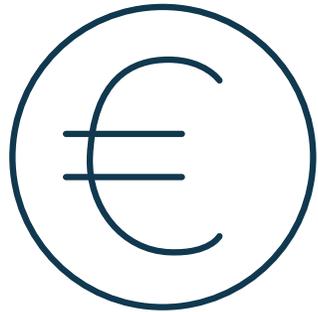
## Consumer Health



// Nonprescription medicines in the categories of dermatology, nutritional supplements, pain, cardiovascular risk prevention, digestive health, allergy, and cough & cold



# Bayer Group Key Data



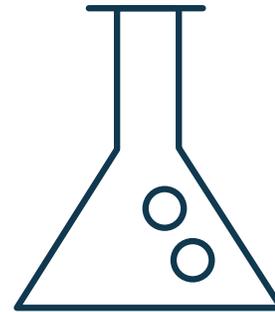
Full-year sales

€**41.4** billion



Employees

**99,538**



Investment in  
research  
& development

€**4.9** billion

(before special items)



In **83** countries we reach  
more than one billion people  
with our products and services.

As of December 31, 2020; employees in full-time equivalents



# Crop Science

## Business Areas



### *Chemical & Biological Crop Protection*

- // Insecticides
- // Fungicides
- // Herbicides
- // SeedGrowth



### *Seeds & Traits*

- // Seeds for broad acre crops (e.g. corn, soybeans, cotton, canola / oilseed rape, rice)
- // Vegetable seeds (e.g. tomato, pepper, cucumber, onion)
- // Traits



### *Digital Technologies & Services*

- // Data platform that measures agronomic performance and gives farmers the option to share with multiple partners
- // Advanced insights that recommend the efficient and sustainable use of crop inputs
- // Precision technologies enable better compliance with regulatory requirements



### *Environmental Science*

- // Weed & pest control products for non-agricultural application in 6 strategic market segments with high impact on better life
  - // Professional Pest Management
  - // Industrial Vegetation Management
  - // Vector Control
  - // Turf & Ornamentals
  - // Forestry
  - // Consumer Lawn & Garden
- // Specialty Actives business

# Bayer Crop Science AVEVA PI System Landscape

As of March 2021



1  
DA server  
+ redundancy

1  
AF  
server

1  
AF  
database

900  
users  
(approx.)

54  
interface  
nodes

210  
interface  
instances

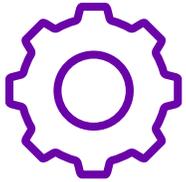
440 k  
tags  
in use

66 m  
Event  
Frames

- Global configuration for 17 sites and 56 plants
- Central system- and site support
- Central License- & IT-Security Management
- Central App Development



# How to Standardize and Create Business Value?



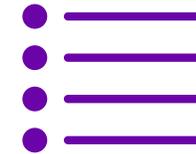
## Challenge

- Create insights to understand Availability, Performance & Quality
- Foster global standards
- Get buy-in from plant workers



## Solution

- Use Shiftconnector io.Performance OEE to create Insights
- Utilization of standardized batch manufacturing data in PI AF
- Minimized manual effort, automation is key



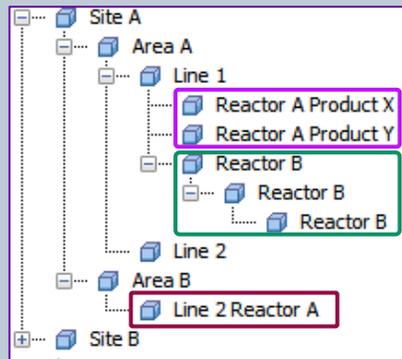
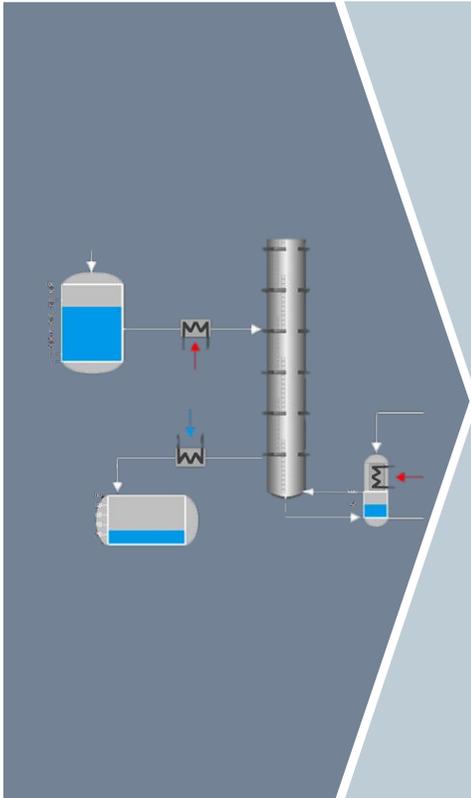
## Benefits

- Better decisions on actual data
- Improved communication on shift
- Standardized AF structure for further use cases

# Solution: How did we Standardize in PI

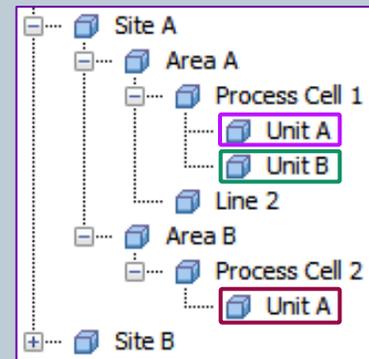
From shopfloor data...

Name	Starttime	Endtime	Template	Product
202101	01.09.2021 00:00:00	01.09.2021 02:00:00	UnitProcedure	X
Operation 1	01.09.2021 00:00:00	01.09.2021 00:30:00	Operation	
Operation2	01.09.2021 00:30:00	01.09.2021 02:00:00	Operation	



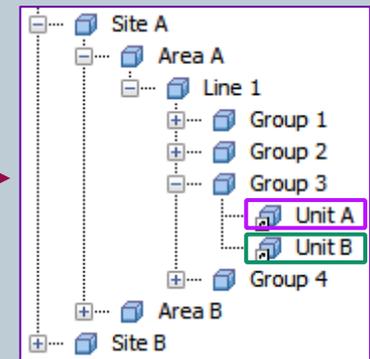
## Raw batch data in PI

Source: EFGEN or directly from batch system, e.g. Simatic Batch, DeltaV, ...



## Introduction of new AF element structures for standardization

Additional references to event frames configured in EFGen, or EFRef (in-house)



## Harmonized ISA-88 & production elements

- Structured based on facility needs
- Final view, visible to io.Performance

---> Reference

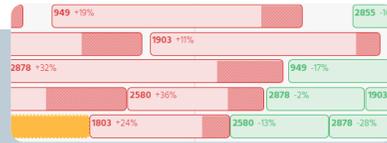
# Solution: How did we Integrate Shiftconnector io.Performance

## ... To Business Decision



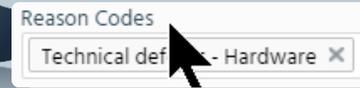
### Import

- Import asset structure and batch events via PI WebAPI
- Queries with mutually agreed standards
- Calculate target times and match with structure in io.Performance Unitprocedures & Operations



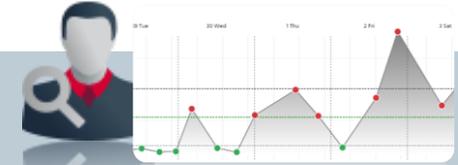
### Visualize

- Close gap in PI tools, runtime-based visualizations
- Gantt view: Overview of the production process
- Process control chart & single value spread: insights on process variations and possible causes



### Contextualize

- Raw data is enhanced with operator insights
- Standard reason codes for loss events are added
- Automatic identification of time state based on reason code



### Reporting

- Provide standardizes reports per process cell / production line
- Available to operator on the line and plant management
- Can be aggregated, due to standard approach

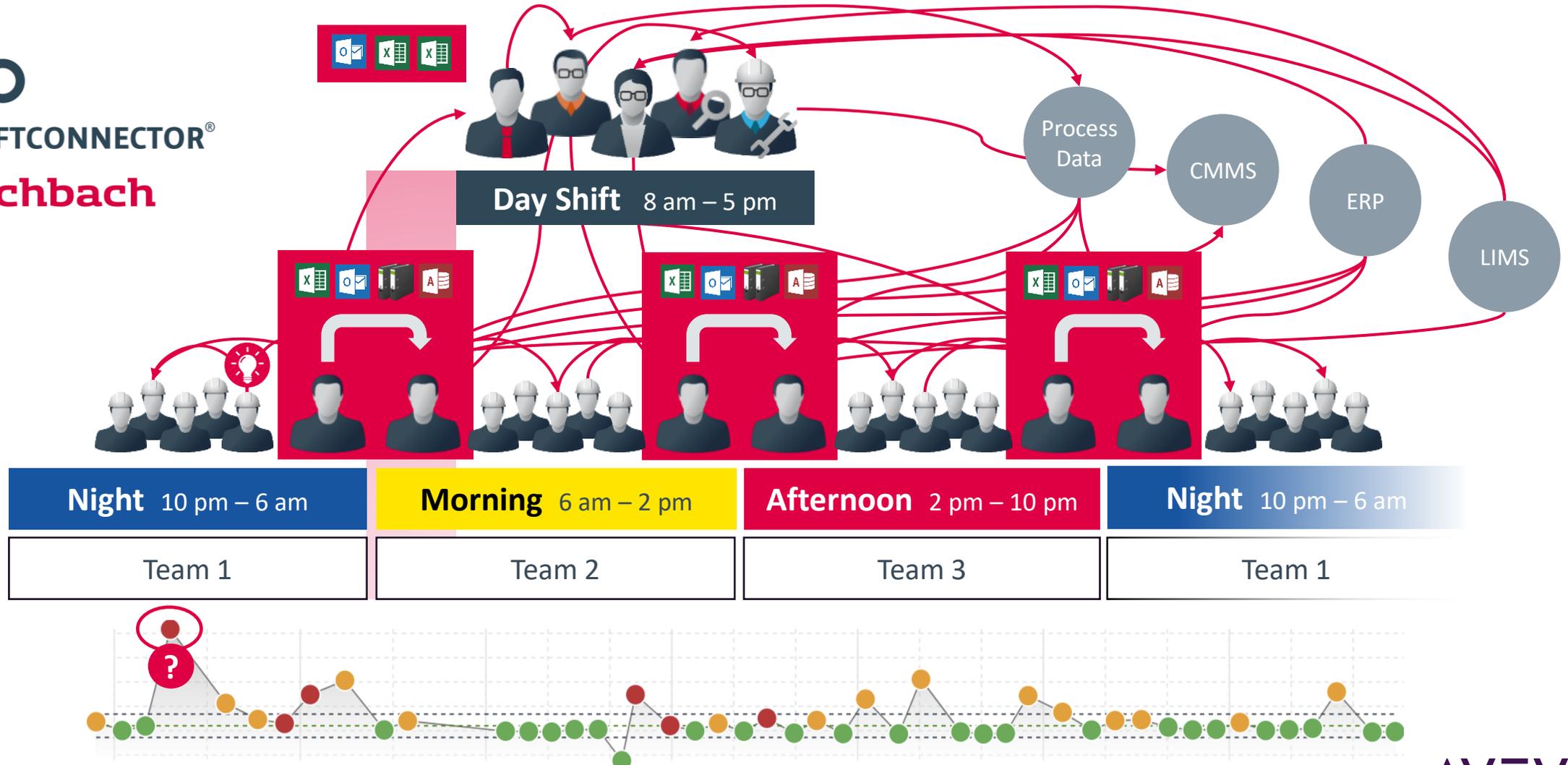
# PI Data & People

## How Bayer Crop Science's Shift Teams can make a Difference



Source:  
Bayer AG, Leverkusen

# Performance Insights with PI Data and Shiftconnector



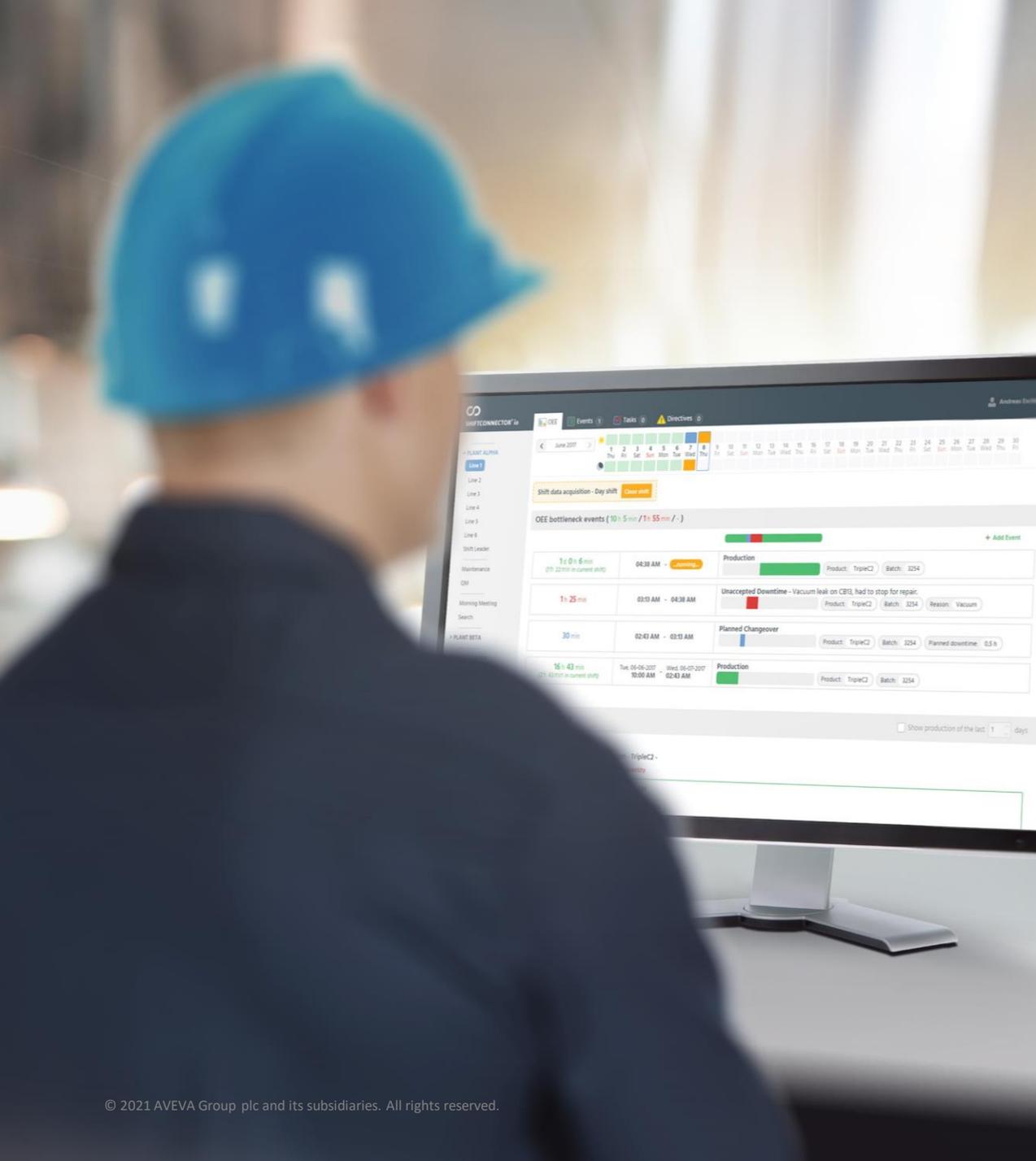
Show: Shift Events > List filter

+ Add Event Handover

Grouping: - None - Category Functional Location Priority

Start/End or Open	Category	Functional Location	Description	Created/Modified ...	Attac...	Priority
Sun, 09-12-2021 11:41 PM	Quality deviation	Reactor 101	Type of deviation: Raw materials Shift: Shift 1 Step of a procedure: Distillation Initiated by: Production Assistant Deviation: CP concentration exceeds upper limit	Veit Hora		High
Sun, 09-12-2021 11:37 PM	Task created		Check all safety showers	Veit Hora		Low
Sun, 09-12-2021 11:36 PM	Task created	Reactor 101	Check temp sensor for product buildup	Veit Hora		Low
Last Logout Sun, 09-12-2021 11:19 PM						
Sun, 10-04-2020 8:11 PM - Sun, 10-04-2020 8:58 PM	Performance Loss	Reactor 101	Product buildup at sensor	Veit Hora		High
Tue, 09-29-2020 6:30 PM - Tue, 09-29-2020 8:31 PM	Performance Loss	Reactor 302	Reactor charging phase too slow	Dennis Ladd		Low
Mon, 09-28-2020 9:40 AM - Mon, 09-28-2020 10:04 AM	Performance Loss	Centrifuge 2626	vacuum pump	Dennis Ladd		Low

- Infoboard
- > Area Alpha
- > Area Beta
- > Area Gamma
- > Area Omega
- Shiftleader
- Line 1
- Line 2
- Line 3
- Morning Meeting
- Search
- > Special Apps
- Search
- MY MAILBOX
- nothing to sign
- no tasks
- Configuration



# Benefits Summary



## Business Value Through Standardization

- ✓ Enabler for cost savings
- ✓ Deep insight into our facilities' performance
- ✓ Standardized batch data in our PI System



eschbach

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THANK YOU

謝謝

DZIĘKUJĘ CI

NGIYABONGA

TEŞEKKÜR EDERİM

DANKIE

TERIMA KASIH

GRACIES

WHAKAWHETAI KOE

DANKON

TANK

TAPADH LEAT

SALAMAT

SPASIBO

GRAZIE

MATUR NUWUN

ХВАЛА ВАМ

MULŢUMESC

PAKMET CIZGE

고맙습니다

GRAZIE

شكرا

FAAFETAI

ESKERRIK ASKO

GO RAIBH MAITH AGAT

HVALA

HVALA

БЛАГОДАРЯ

GRACIAS

MAHADSANID

TEŞEKKÜR EDERİM

ТИ БЛАГОДАРАМ

DANKJE

EΥΧΑΡΙΣΤΩ

GRATIAS TIBI

OBRIGADO

TAK DANKE

AČIŪ

SALAMAT

MAHALO IĀ 'ŌE

TAKK SKALDU HA

МЕРЦИ

RAHMAT

MERCI

GRAZZI

PAKKA PÉR

ありがとうございました

DI OU MÈSI

ĐAKUJEM

HATUR NUHUN

PAXMAT CAĠA

SIPAS JI WERE

TERIMA KASIH

CẢM ƠN BẠN

UA TSAUG RAU KOJ

TI БЛАГОДАРАМ

СИПОС

WAZVIITA

FALEMINDERIT



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