

AVEVA PI WORLD

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

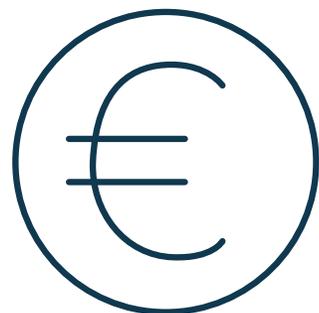
Consumer Health



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



Bayer Group Key Data



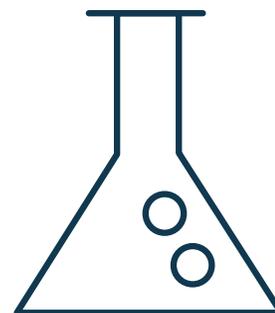
Full-year sales

€**41.4** billion



Employees

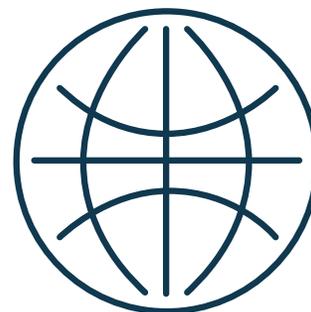
99,538



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

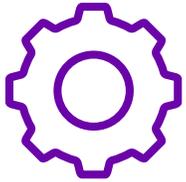
440 k
tags
in use

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?



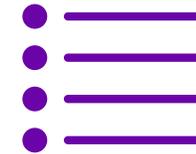
Challenge

- 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



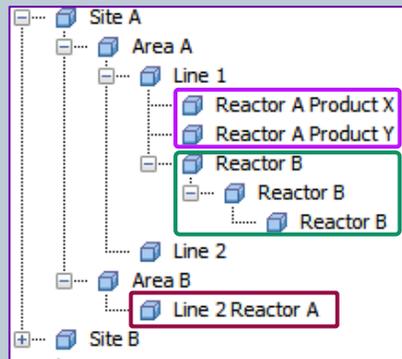
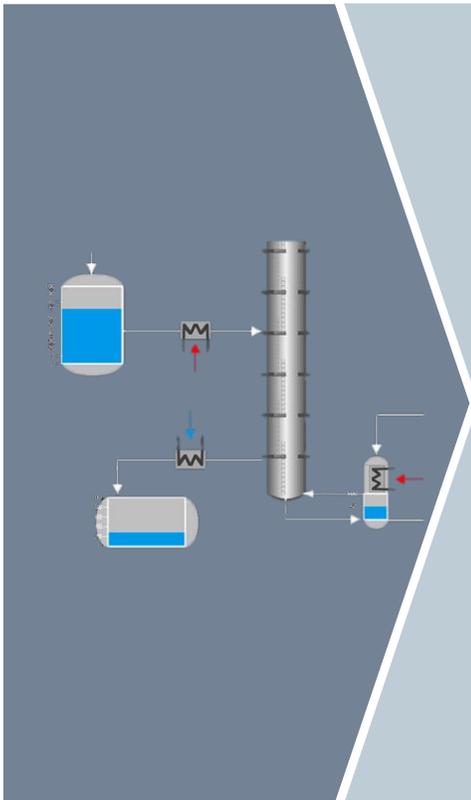
Benefits

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

Solution: How did we Standardize in PI

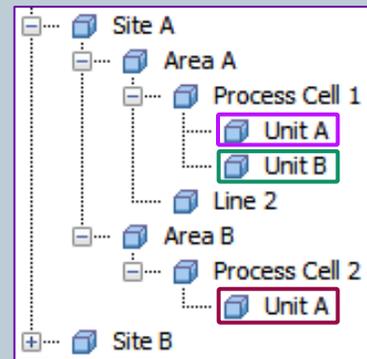
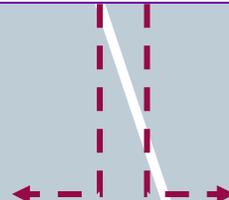
From shopfloor data...

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	



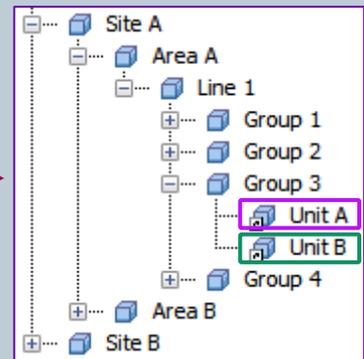
Raw batch data in PI

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

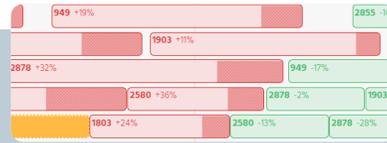
Solution: How did we Integrate Shiftconnector io.Performance

... To Business Decision



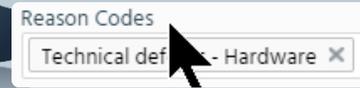
Import

- 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



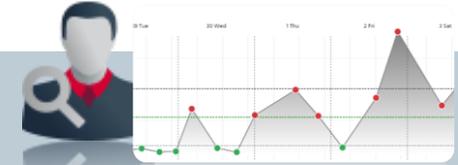
Visualize

- 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

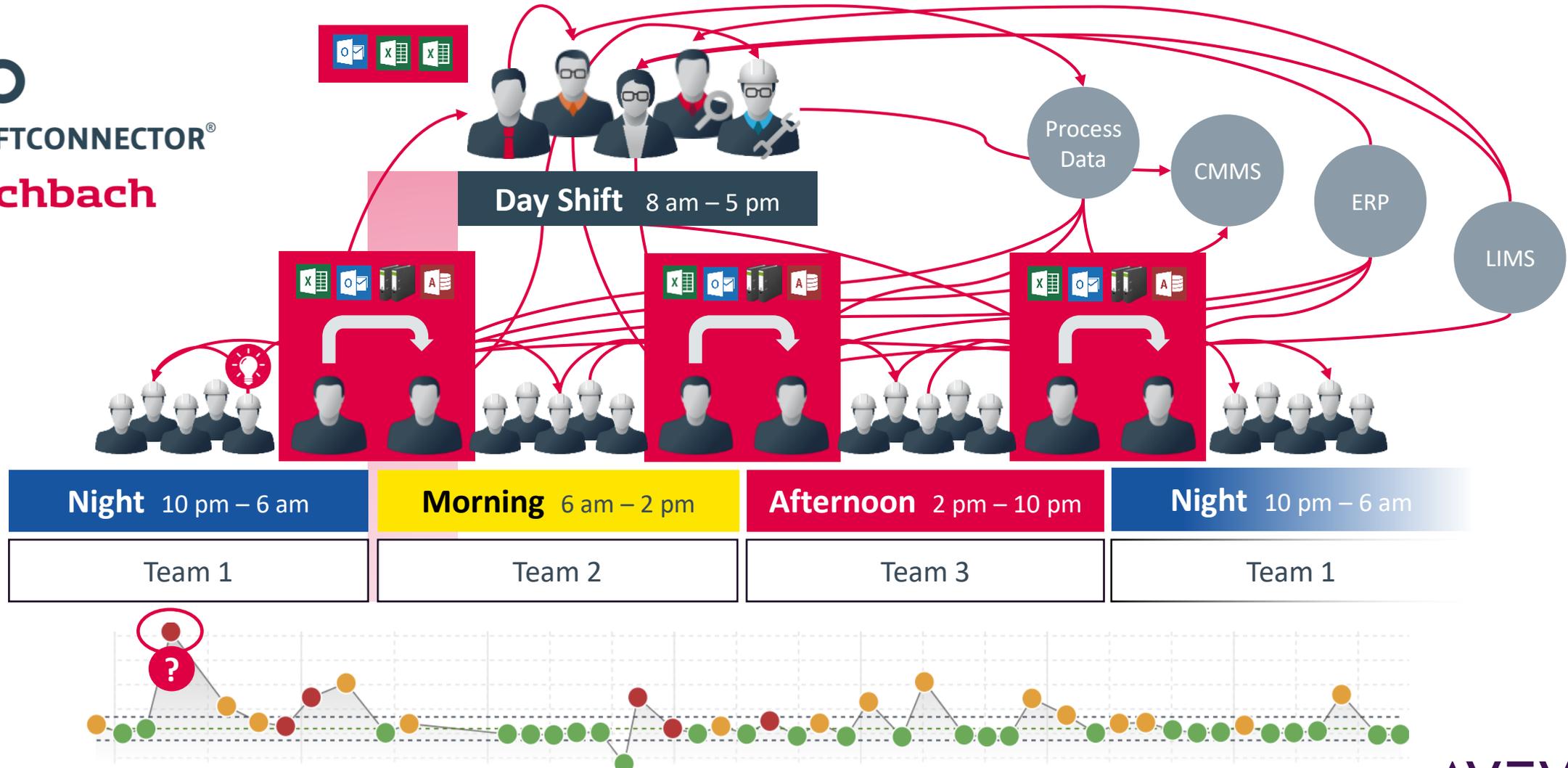
PI Data & People

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



Source:
Bayer AG, Leverkusen

Performance Insights with PI Data and Shiftconnector



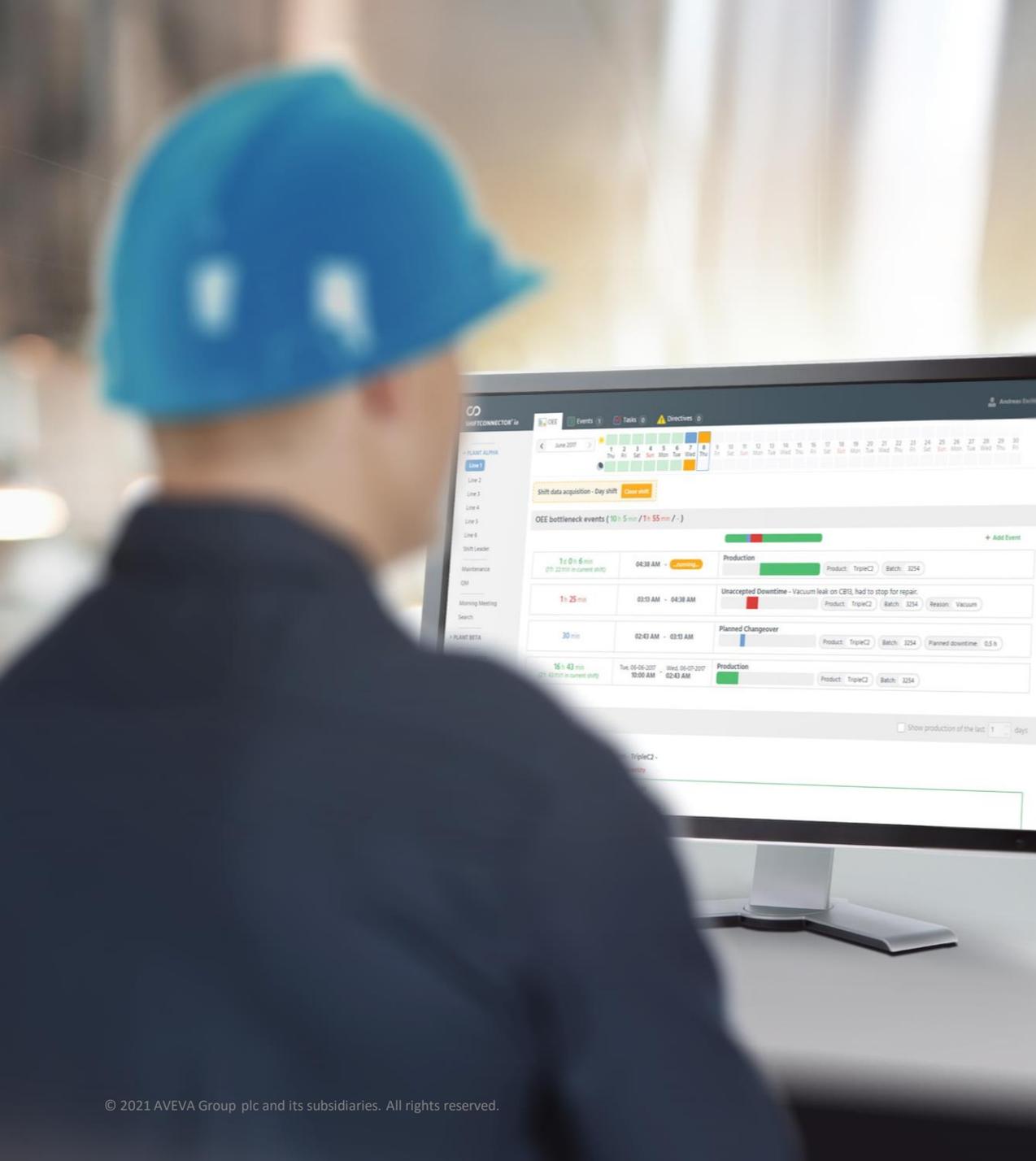
Show: Shift Events > List filter

+ 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



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