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Driving manufacturing excellence at dsm-firmenich with standardized PI Server data and AI

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AVEVA

dsm-firmenich

(Bio-)Chemical Industry

dsm-firmenich increases OEE by 3%

Challenge

- Limited shopfloor involvement in OEE process
- No global standardized solution for OEE tooling in place
- Untapped knowledge hidden in existing shopfloor communication data

Solution

- Connected the AVEVA™ PI System™ with Shiftconnector to create a powerful OEE tooling at global scale
- Explored new ways of working using a smart search AI assistant for troubleshooting and root cause analysis

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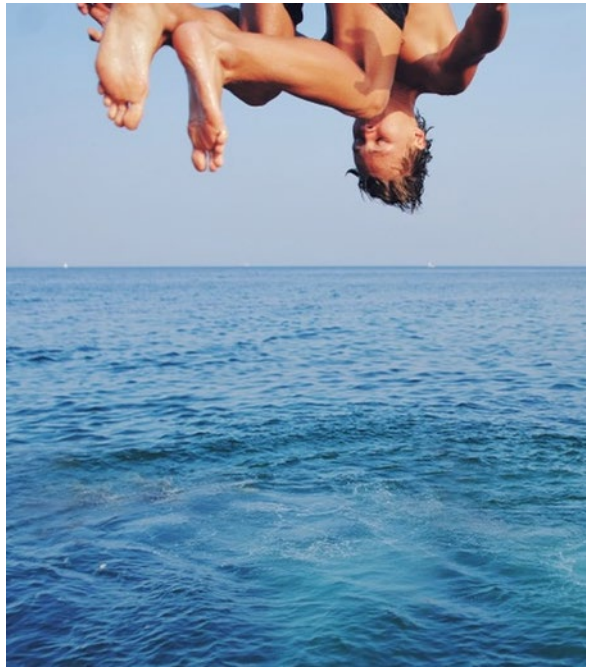
Innovators in nutrition, health and beauty

Perfumery
& Beauty

Taste, Texture
& Health



Health, Nutrition
& Care

Animal Nutrition
& Health

Three dynamic markets, two iconic names, one foundational purpose

dsm-firmenich: we bring progress to life
We're a trusted partner to global companies operating in high-growth and resilient markets. We're innovators in nutrition, health, and beauty

~30,000
passionate, talented, and diverse people in our global team

150+ years
of combined scientific discovery and innovation heritage

€12+ bn
combined revenue

A global group with European roots

88
Manufacturing sites

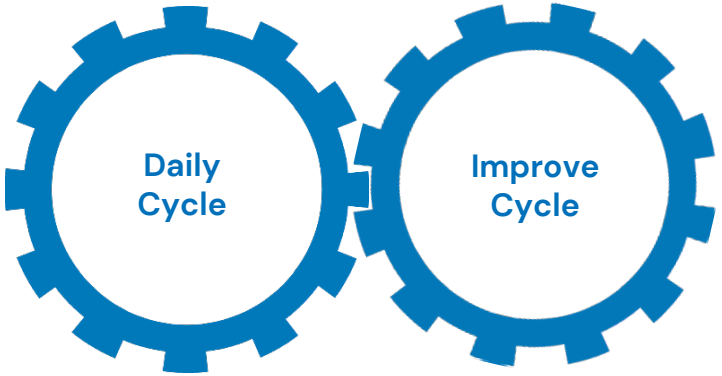
78
Application labs

40
Creation centers

70
Premix sites

The challenge

- **Vision: Become world class in Operations**
- Our Continuous Improvement journey focusses on People, Practices & Performance*
- People & Practices:
  "Manufacturing Excellence" work processes as fundamentals in place since > 15 years



How can "digital" support People and Practices to deliver Performance on global scale?

Note: * focus of this presentation is set on legacy DSM continuous improvement journey

The use-case: a 3-steps approach

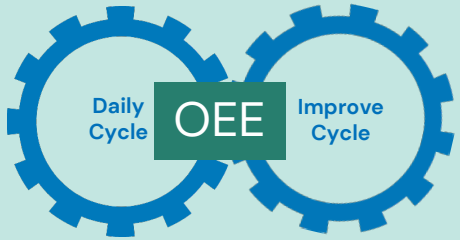
Provide a powerful and value-adding digital backbone

Operations Data Layer (ODL)

AVEVA™ PI System

Connect smart digital solutions to maximize the impact of the Data & People interplay

SHIFTCONNECTOR®



Use cutting-edge technology to unlock untapped insights from historical data

AI

Digital as enabler to become world class!

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01 ODL Introduction

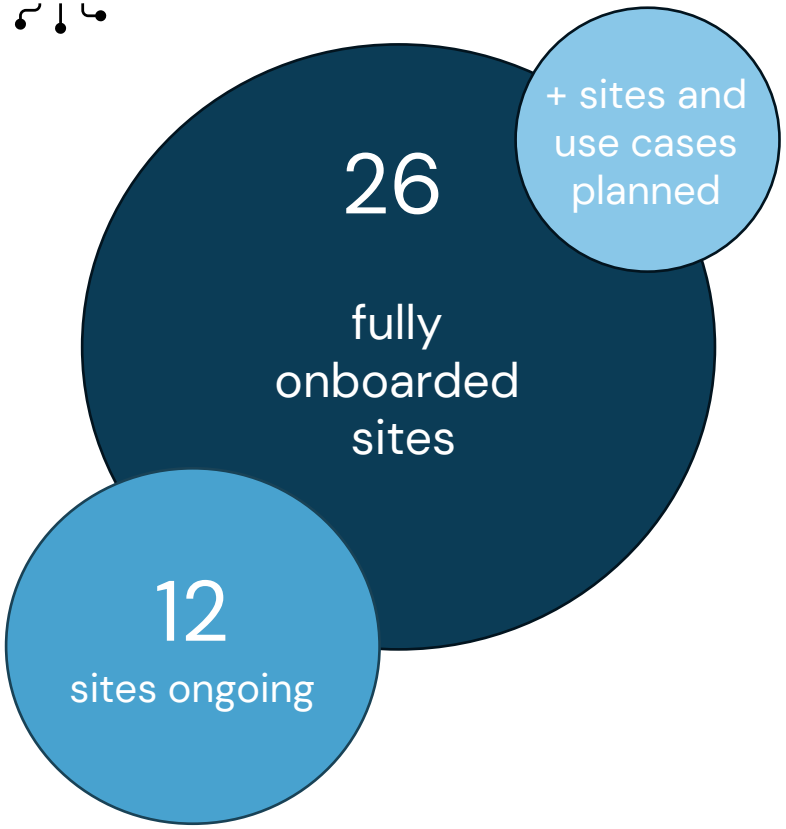
What's ODL?

ODL is the acronym of Operations Data Layer, our standard Time-Series data platform for operations

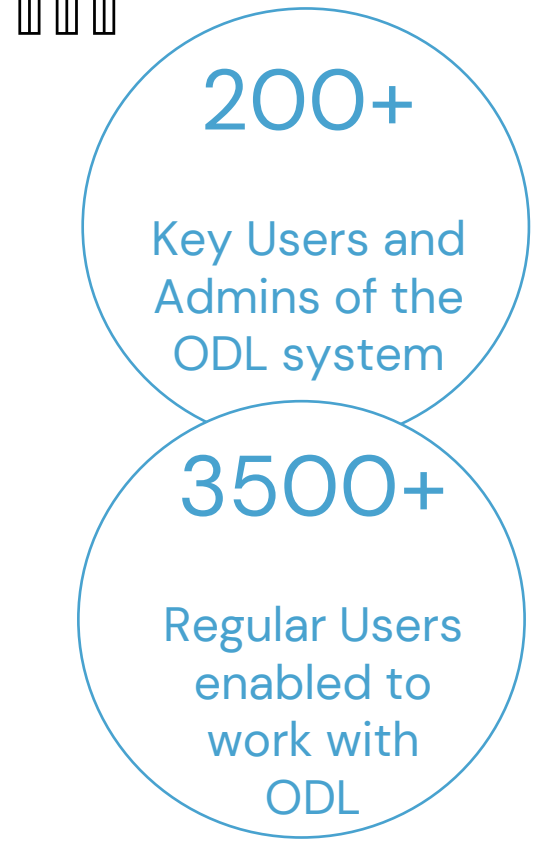
- Based on AVEVA PI, that centrally integrates and organizes siloed operations data.
- **Collects, enhances and delivers OT data** in real time, creating **trusted operations data** to enable digital transformation,
- Making it easy to **analyze trends** and **uncover issues** to improve reliability and production efficiency.

ODL achieved global scale, with most of large sites already connected

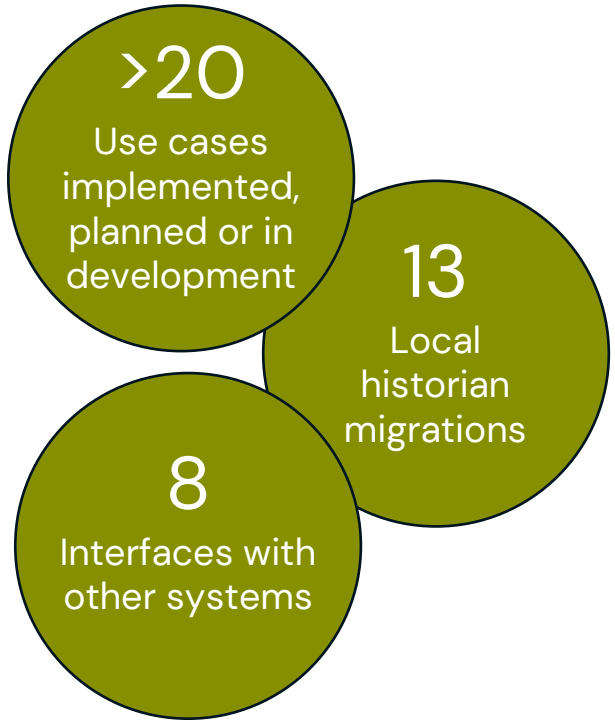
Sites coverage



People impact



Value developments



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ODL journey

Challenges

- Siloed operations data across different control systems and historians; scattered landscape across 130 sites
- Push from Management to become more “digital” → started as top-down program

Benefits

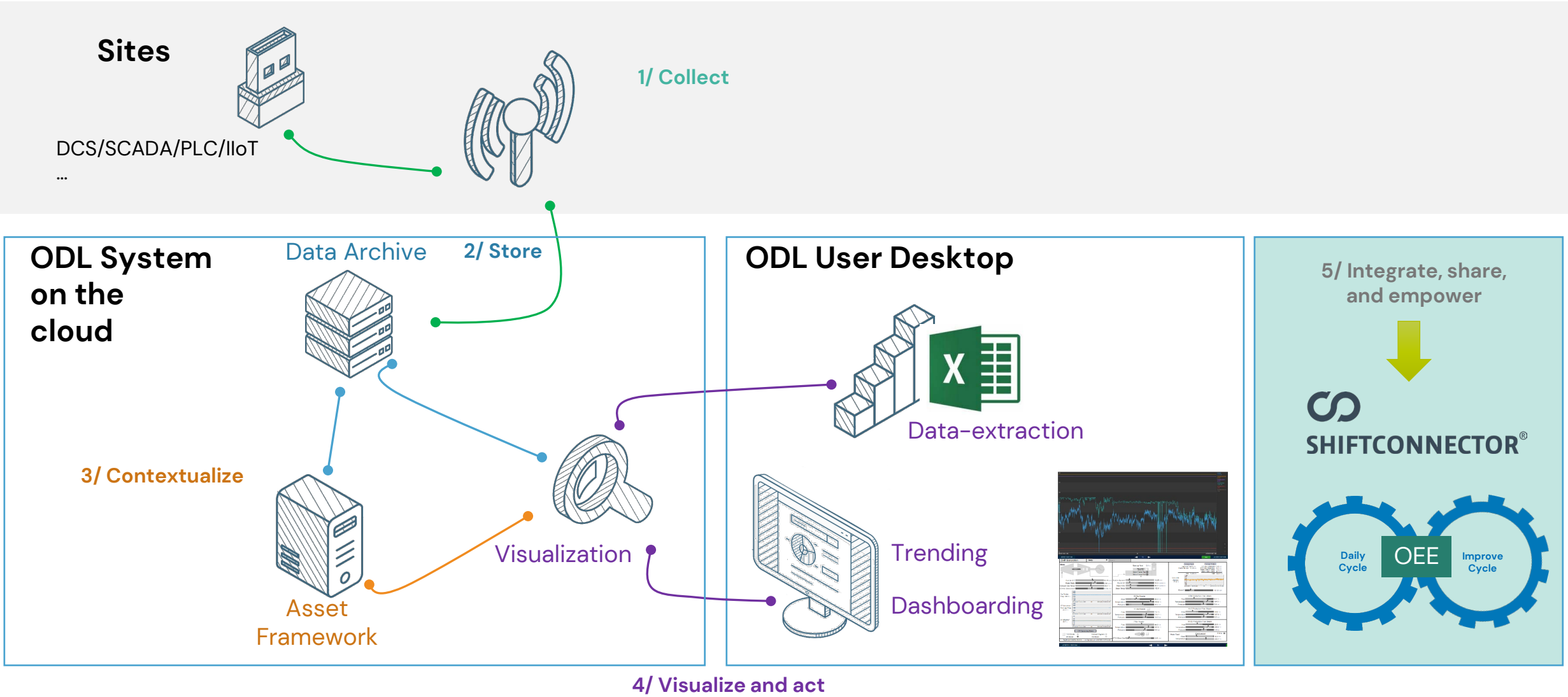
- Savings in infrastructure, managed operations, licenses, interfaces
- Over 20 types of use cases delivering value across various dimensions such as enhanced visibility of critical equipment through PI vision dashboards

Lessons learned

- Change management is key for success
- Data trust is key for platform adoption

ODL Value

The product itself (AVEVA PI) provides five main functionalities



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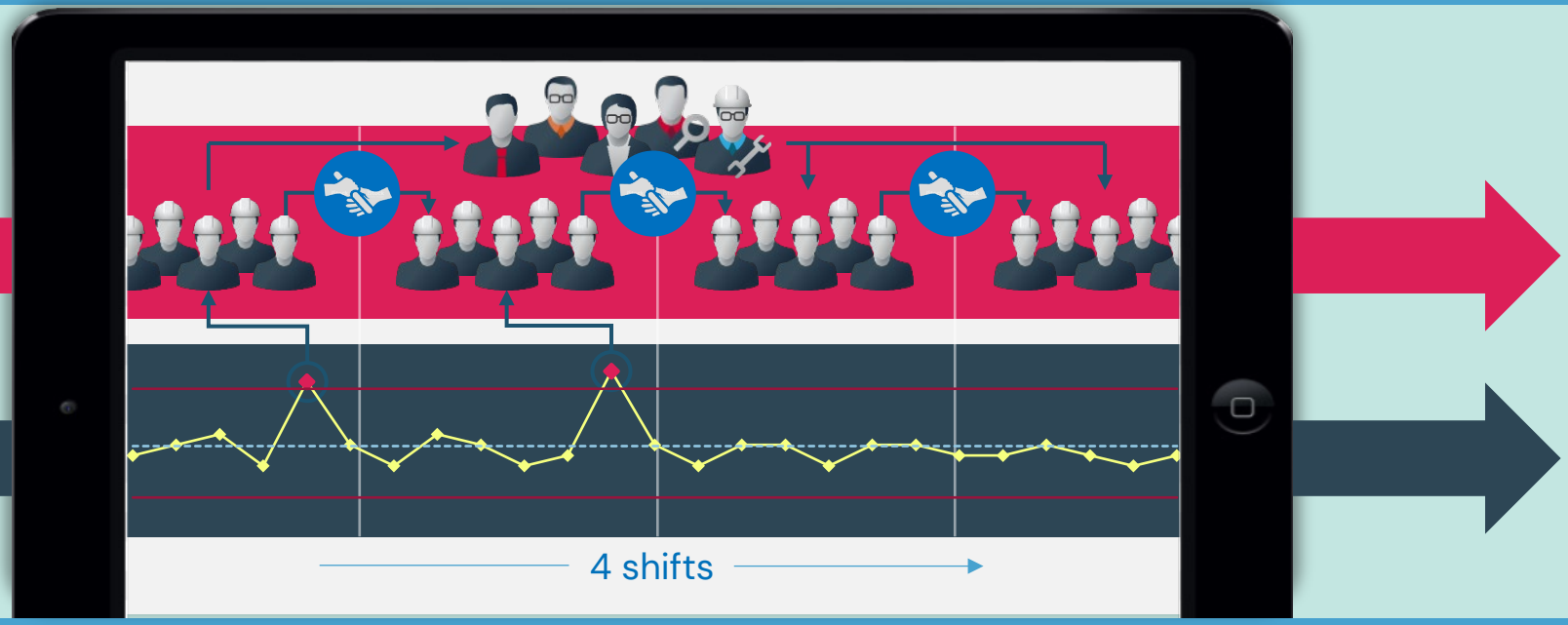
02 Overall Equipment Effectiveness

SHIFTCONNECTOR®

People

AVEVA

ODL



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Asset Performance: Combining ODL with a Collaboration Layer

Manage Processes 24/7
track events & actions

Drive Continuous Improvement
with Data & Insights

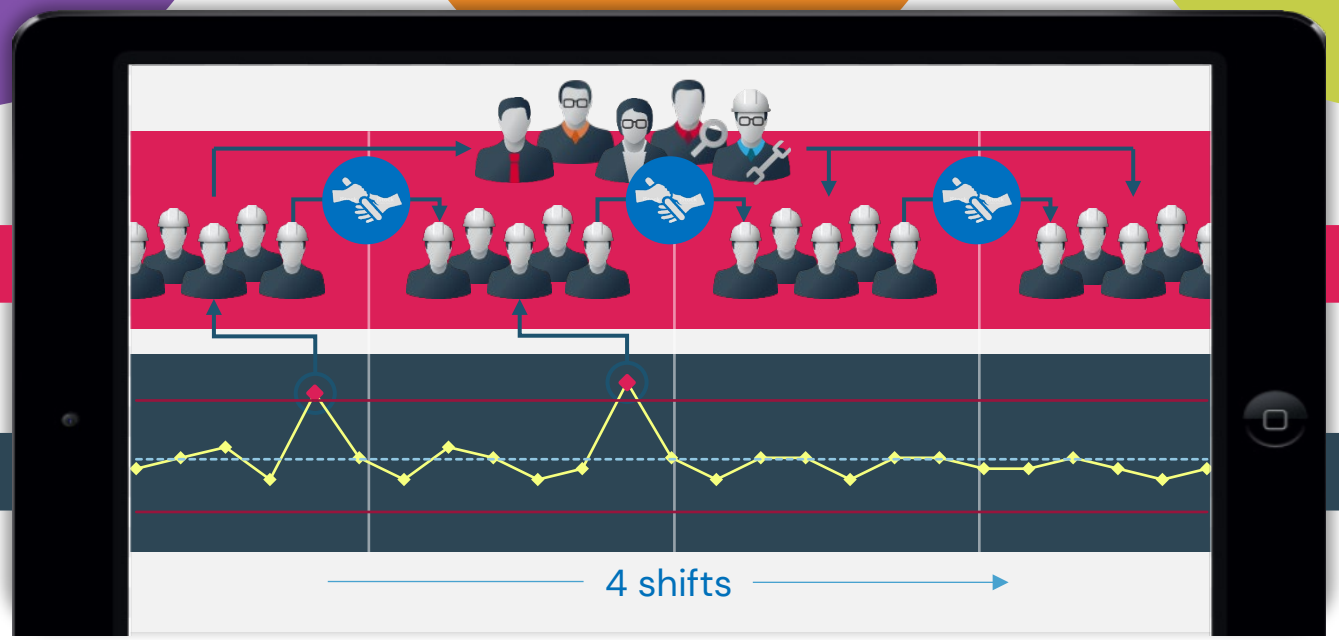
Capability Building
Plant Knowledge Base

SHIFTCONNECTOR®

People

AVEVA

ODL



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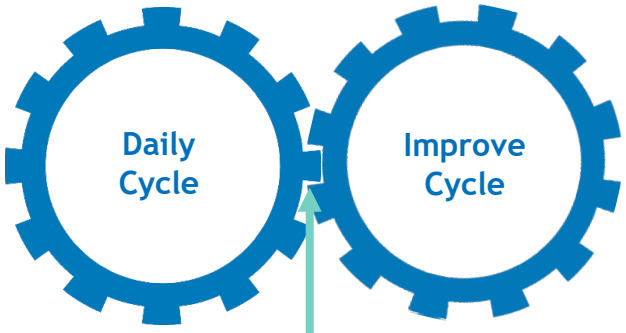
AVEVA PI System & Shiftconnector for OEE tracking

Why is it important for us?

Manufacturing Excellence



OEE
Overall Equipment Effectiveness

What is the goal?

- Empower the shopfloor to participate in OEE loss accounting to unleash their unique knowhow
- Generate high quality OEE data to enable informed decision-making and facilitate CI
- Provide full transparency on asset performance for all asset types (batch, continuous, discrete)

How is it realized?

1. Contextualized process data from the PI Server is consumed by Shiftconnector io.Performance
2. Loss allocation is done on shopfloor level in Shiftconnector environment
3. Insights from OEE / loss allocations are provided in globally standardized dashboard solution

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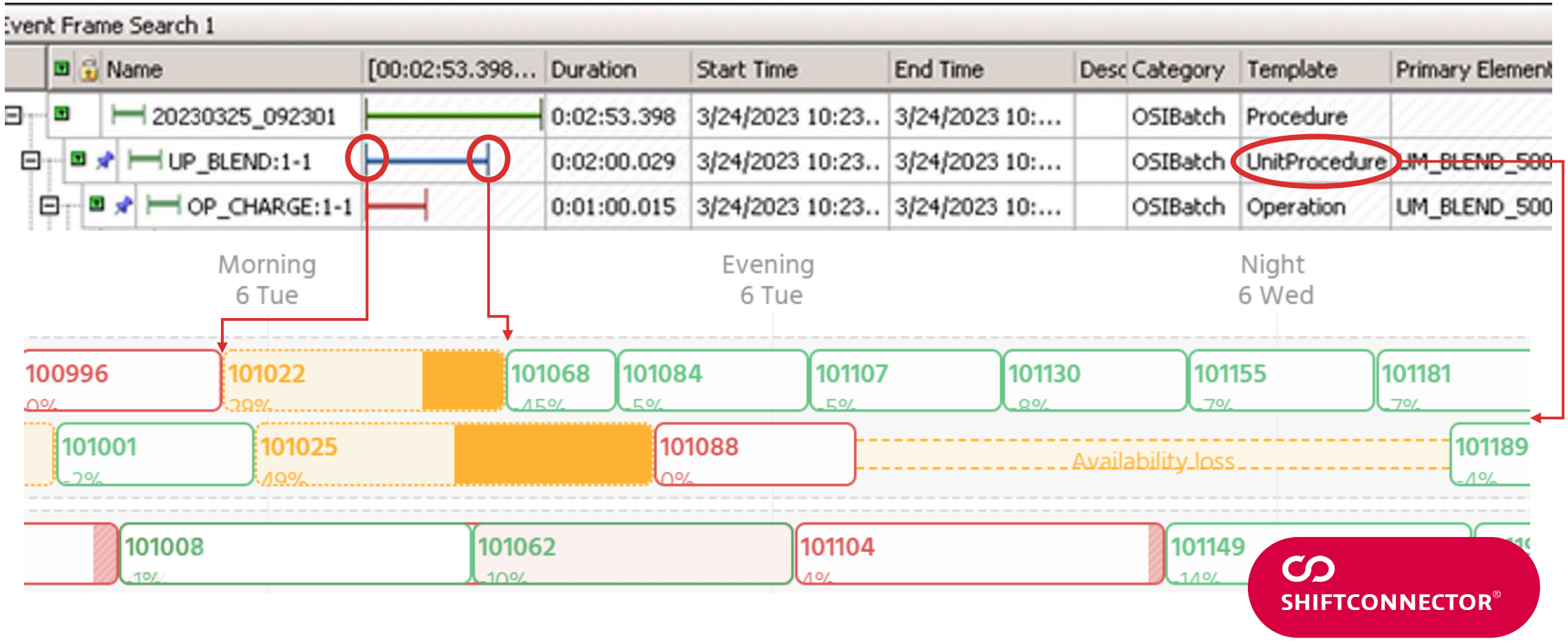
1) PI Event frames are consumed by Shiftconnector to provide data basis for OEE



Data quality is key for a smooth integration

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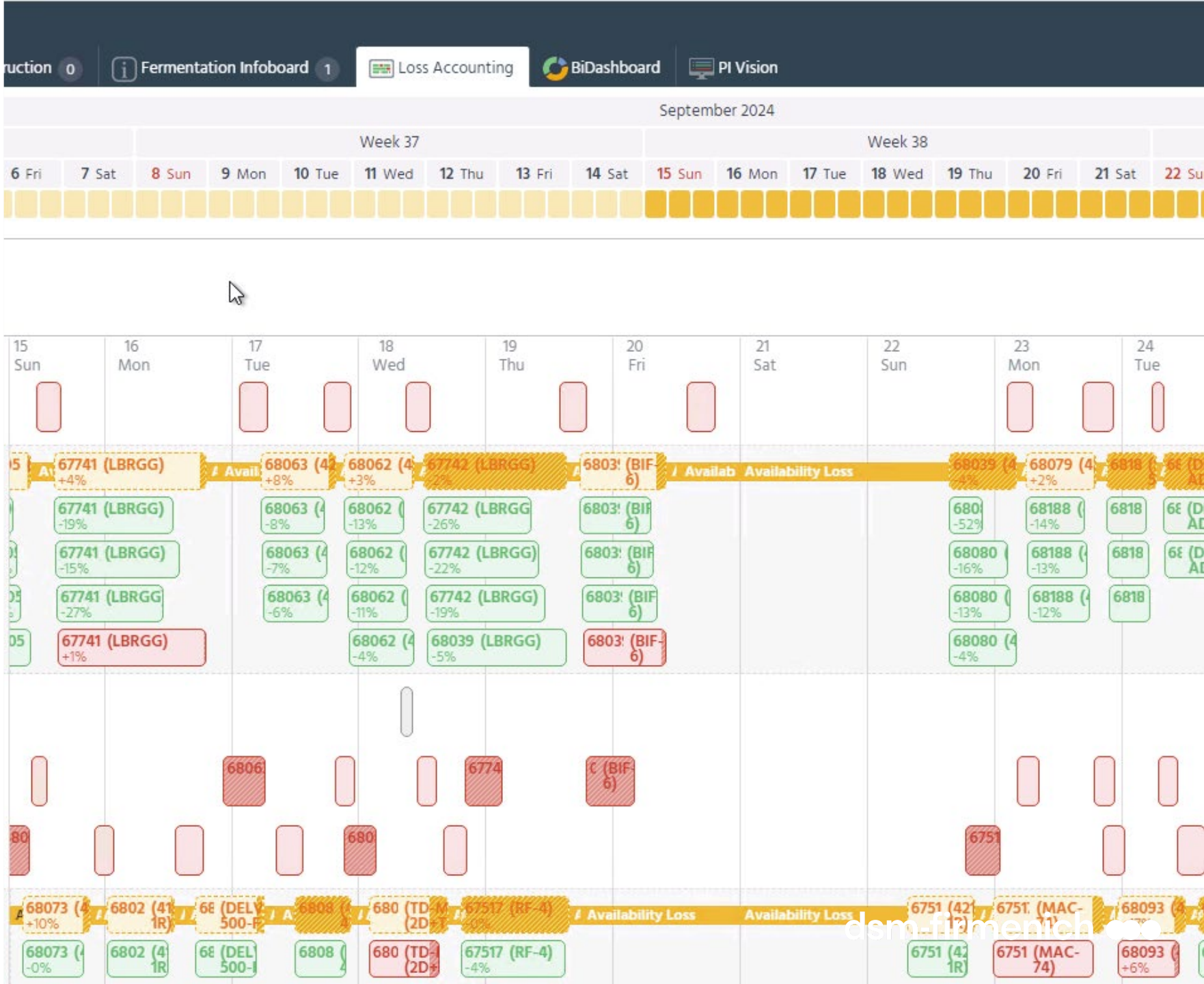
2) Loss allocation is done on shopfloor level

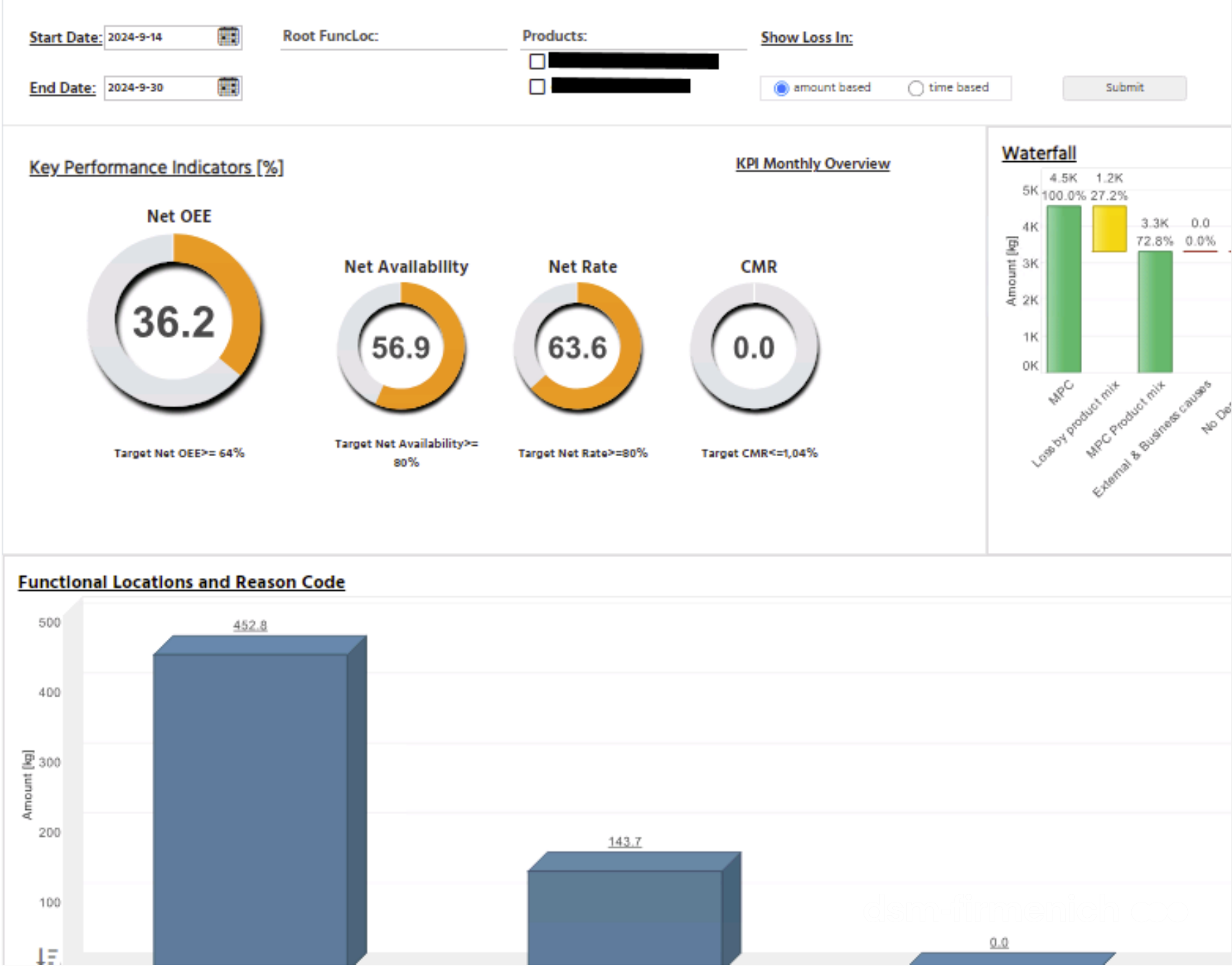
- Continuous, batch or discrete manufacturing processes can be tracked
- Operator uses his established One-Window-Environment
- Clear visual management ensures efficient loss allocation



3) OEE KPI and related data is fully transparent

- OEE KPIs
- Loss waterfall
- Top Performance Killers

Full OEE transparency in real time



Overall Equipment Effectiveness

Improvements enabled by AVEVA PI System & Shiftconnector

Manufacturing Plants/Lines onboarded

4

Manufacturing Plants/Lines ongoing

7

OEE increase enabled:

1–3%

- up to 10% increase expected for some lines
- OEE increase in line with outside-in perspective

"It can be a game changer" (regarding shopfloor engagement)

"Shiftconnector has become the heart of our production department, and I think, of the whole site"

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03

AI as an enabler to unearth the data treasure build on historic data

SHIFTCONNECTOR®
Smart Search

AI Search …

AI-powered Smart Assistants –
Converts Implicit into Explicit Knowledge

Knowledge Transfer
Soften impact of retirement of "babyboomer" generation

Faster Troubleshooting
Shorten unscheduled downtimes

Continuous Improvement
Support Root-Cause-Analysis

Troubleshooting and Continuous Improvement activities as direct follow-up of OEE tracking

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AI-powered Smart Search

AI Search ...

...viscous

... C808

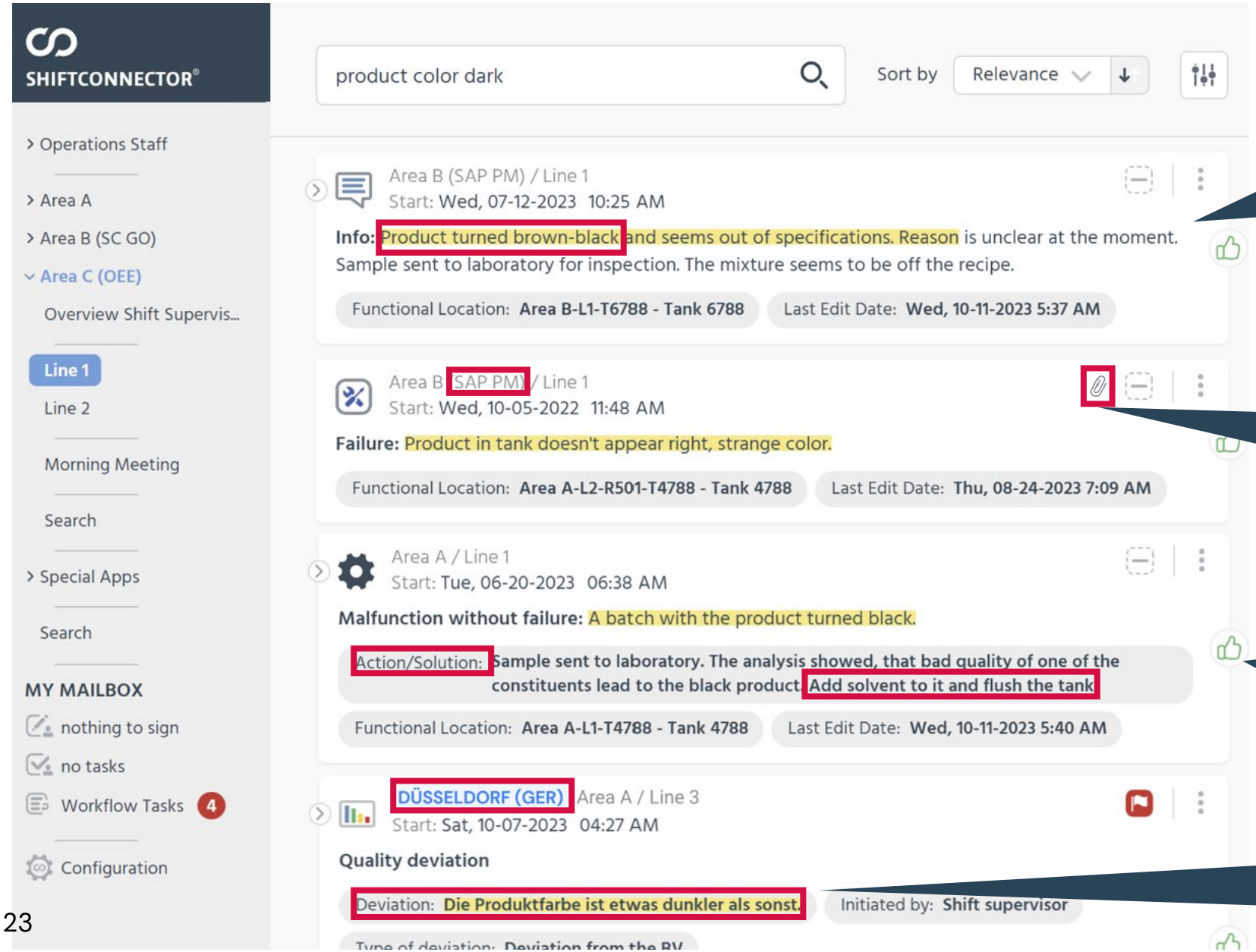
... thick like syrup

... sticky like gelatine...

very syrupy ...

... Centrifuge

Smart Search – semantic knowledge retrieval



Semantic Search understands **context** and ranks results

Search across other **Systems** and **attached files**

Operator feedback to **improve search results**

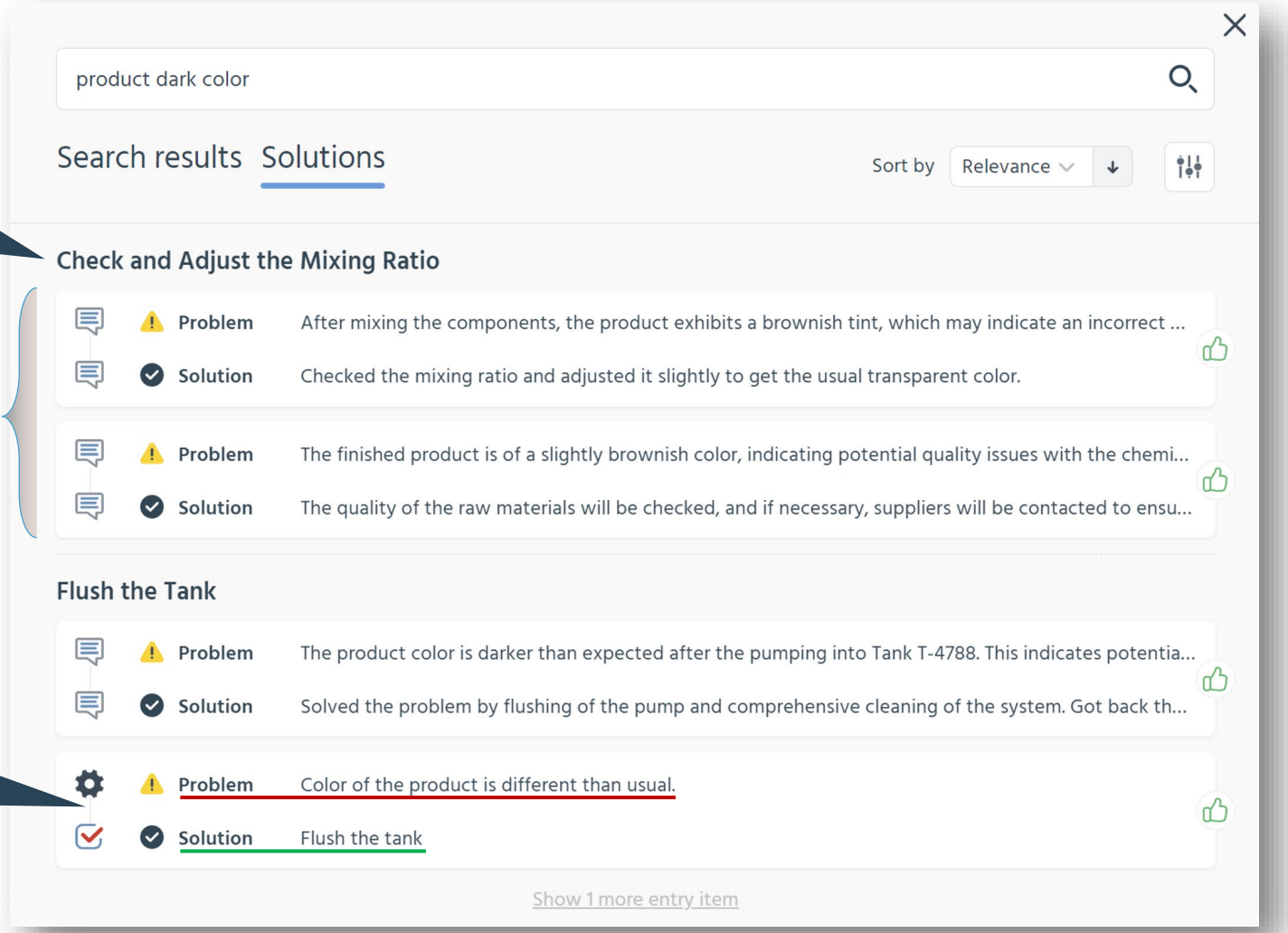
Multi Language model works across sites and languages

Smart Solutions – structure knowledge

Summarized solution for fast overview of all solutions at hand

Structured knowledge in topic groups

Identification of **problem** and **solution**



Faster **Troubleshooting**

Better **Continuous Improvement** Processes

Better **Knowledge Transfer**

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Summary

Goal

Become world class in operations

Use-case

Operations Data Layer (ODL)

AVEVA™ PI System

SHIFTCONNECTOR®

OEE

SHIFTCONNECTOR® Smart Search

AI

Results

- Implemented a standardized and reliable state-of-the-art overall equipment effectiveness (OEE) tooling at global scale enabling to improve OEE by 1-3%
- Increased shopfloor involvement by putting the operator at the core of the OEE tracking process

Outlook

- Explore new ways of using a smart search AI assistant for troubleshooting and root cause analysis

We bring progress to life

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Results

- **Implemented a standardized and reliable state-of-the-art solution for overall equipment effectiveness (OEE) at global scale enabling to improve OEE by 1-3%**
- **Increased shopfloor involvement by putting the operator at the core of the OEE tracking process**

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