



Danone first steps in improving plant efficiency with Aveva PI System in Food and Beverage

Bram PEETERS

Andreas CONJAERTS

AVEVA



DANONE
ONE PLANET. ONE HEALTH

DANONE

Rotselaar, Belgium

A global presence



54% Essential Dairy
& Plant-based

#1

WORLDWIDE⁽¹⁾

in Fresh Dairy Products &
Plant-Based Products



Fresh and
premium dairy



Plant based



Coffee creamer



Plant-based coffee



31% Specialized
Nutrition

#2

WORLDWIDE⁽¹⁾

in Early Life Nutrition

#1

EUROPE⁽¹⁾

in Advanced Medical Nutrition



Core milk



Specialized
pediatrics



First diet



Adults



Healthy aging



15% Waters

#2

WORLDWIDE⁽¹⁾

in Packaged Waters
(by volume)



Waters



Aquadrinks

Data reference year 2020

AVEVA

Our Belgian footprint



>1.800 Danoners



Ghent

HOME OF PLANT-BASED



Wevelgem

ALPRO FACTORY
& DISTRIBUTION CENTRE



Zwevegem

ALPRO OFFICES



Rotselaar

FACTORY &
DISTRIBUTION CENTRE



Brussels office

Danone EDP, Waters
and Specialized Nutrition



Certified

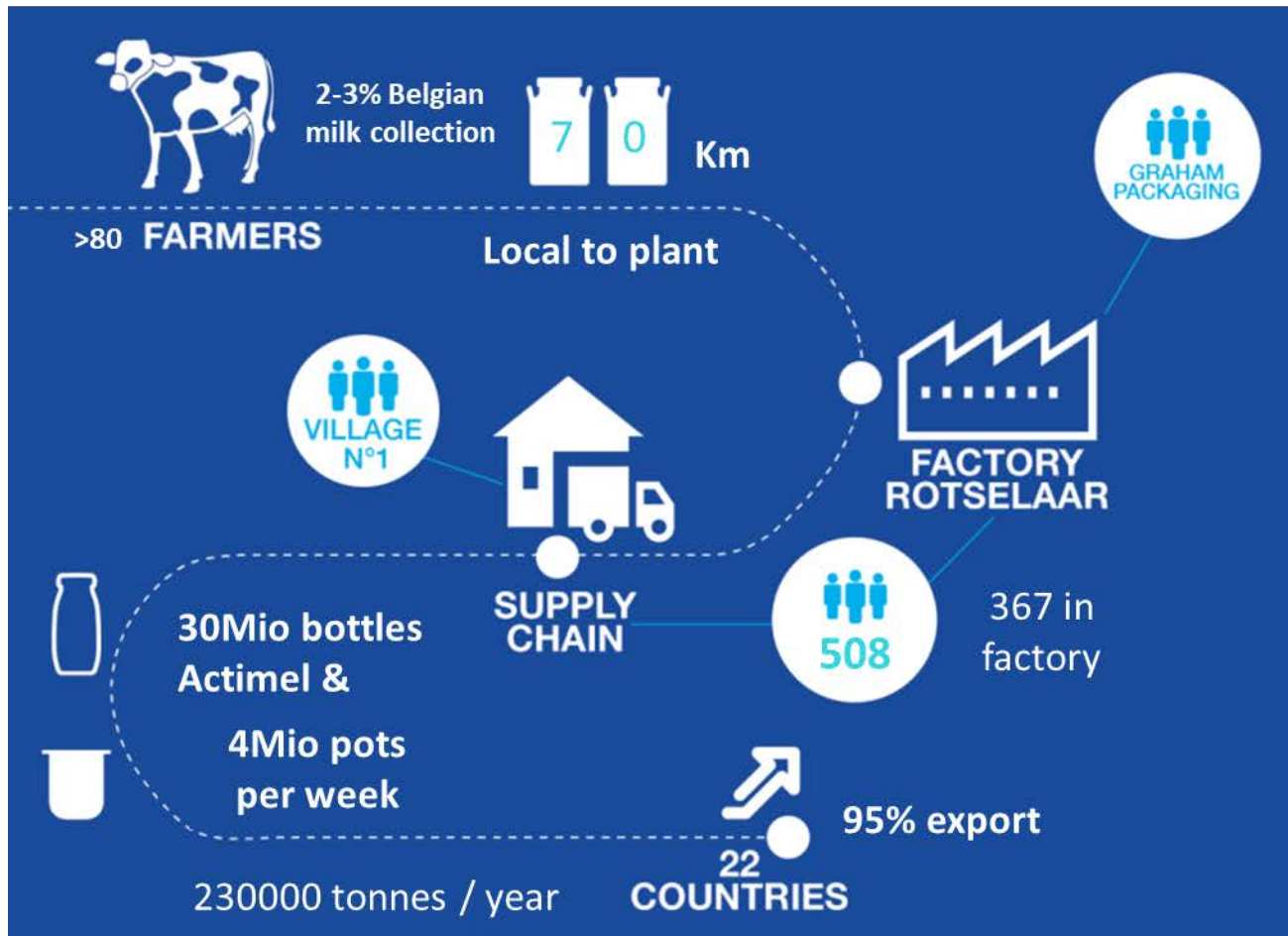


Corporation

AVEVA

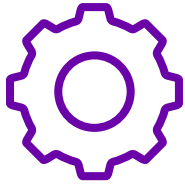
Rotselaar site: Factory & Distribution Centre

Production site specialized in drink yogurts & spoonable yogurts and EU supply point



AVEVA

Improving plant efficiency



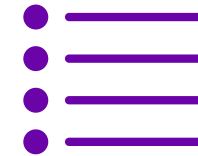
Challenge

- Combine data from several systems (Single Source of Truth) and provide real-time updates to continuously changing input.
- Providing a platform for analytics and problem solving.
- All this while making sure each plant doesn't have to reinvent the wheel.



Solution

- Creation of a global data model and governance.
- Deployed AVEVA PI System technology including PI AF and PI Vision as an advanced foundation for Process Monitoring, Condition Based Maintenance & Advanced Analytics.



Benefits

- Increased visibility on data, easier to spot potential issues.
- Solutions from one plant can be rolled out to other plants and tweaked where needed.

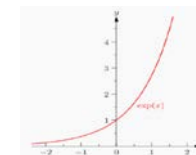
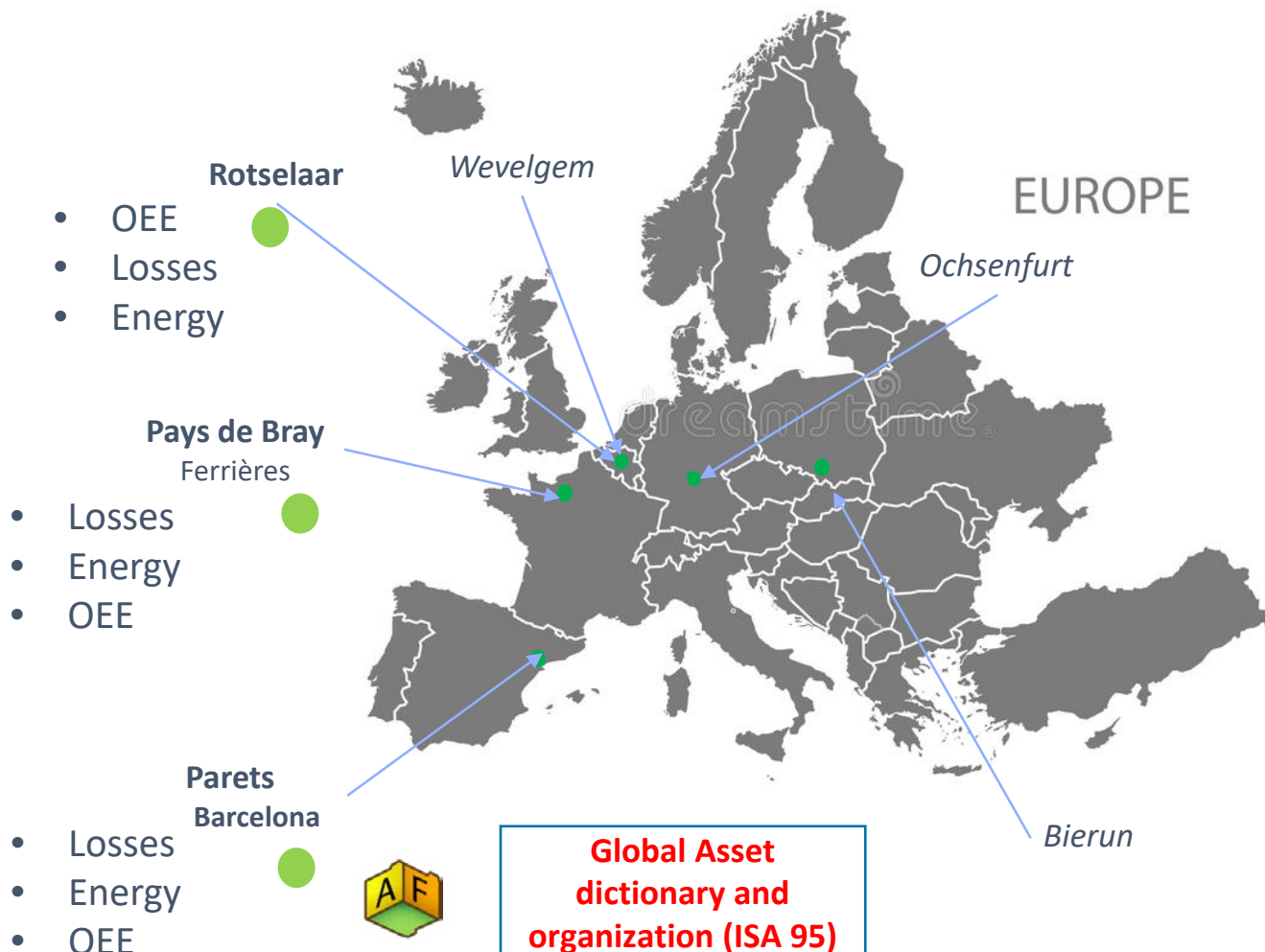
Data model & plant organisation



Current situation EDP Europe (Oct 2021)

Digital Manufacturing Acceleration

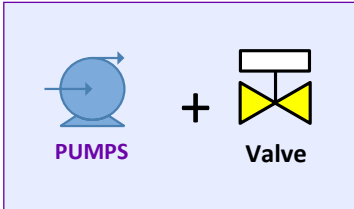
Global data foundation first for project acceleration

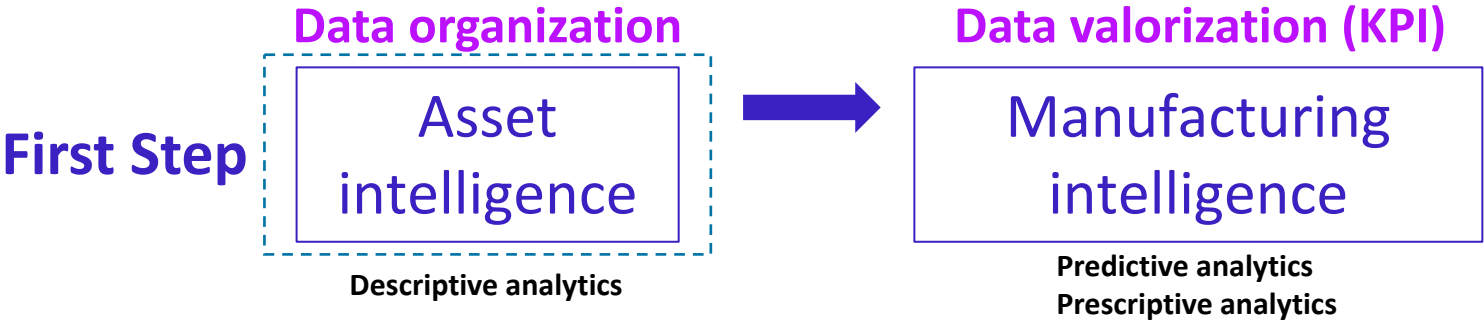


- First Step: **Global Manufacturing Data Objects Catalogue** definition
 - **Assets First**: Primary physical model: **Done**
 - Operations: upcoming (started in ROT)
 - Products
- **PI System installation** on each site:
 - On premise: **Done** for ROT, Parets & Pays de Bray
- **Global Manufacturing Data Model implementation**:
 - **Foundation** for all sites: **Done in ROT**
- **Use cases implementation** (based on foundation):
 - OEE: **Rotselaar**, Pays de Bray, Parets
 - Wastes & Energy: Pays de Bray, Parets
 - CIP: **Rotselaar**, Pays de Bray, Parets
 - Performance: in progress

Global asset organization based on codification (repository)

Unique global codification based on ISA95 Standard + Danone approach

Site 0332 Rotselaar					
	Area	Cell	Unit	Equip. Module	Ctrl. Module
ID	0301	07101	113001	02070001	0200000001
Name	Pack	LN01	Filler 1	Decoration Filler 1	Main Filler 1 Motor
Family	Packaging	Packaging line	Filler	Decoration	Motor
Family ID	03	07	113	0207	0200





Osisoft-Danone: current situation EDP

Foundation implementation

Foundation

Asset dictionary
and organization
(ISA 95)



Plant Asset

Calculation

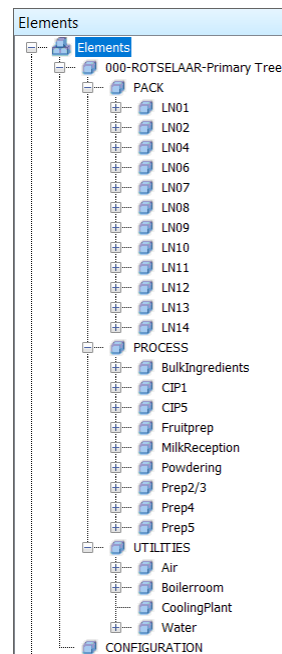
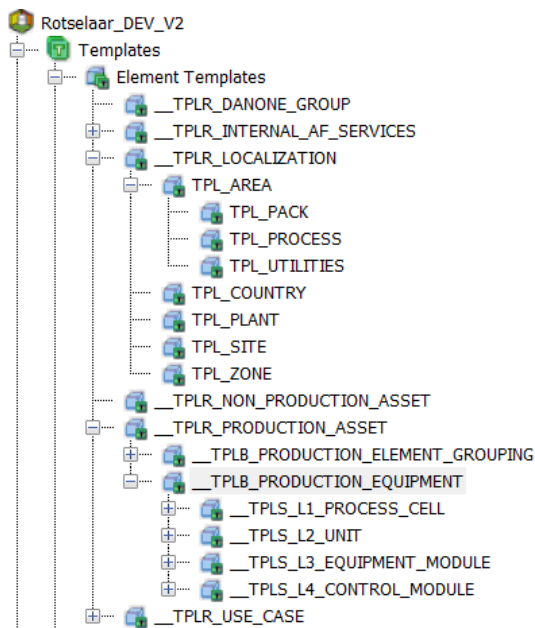
Reporting



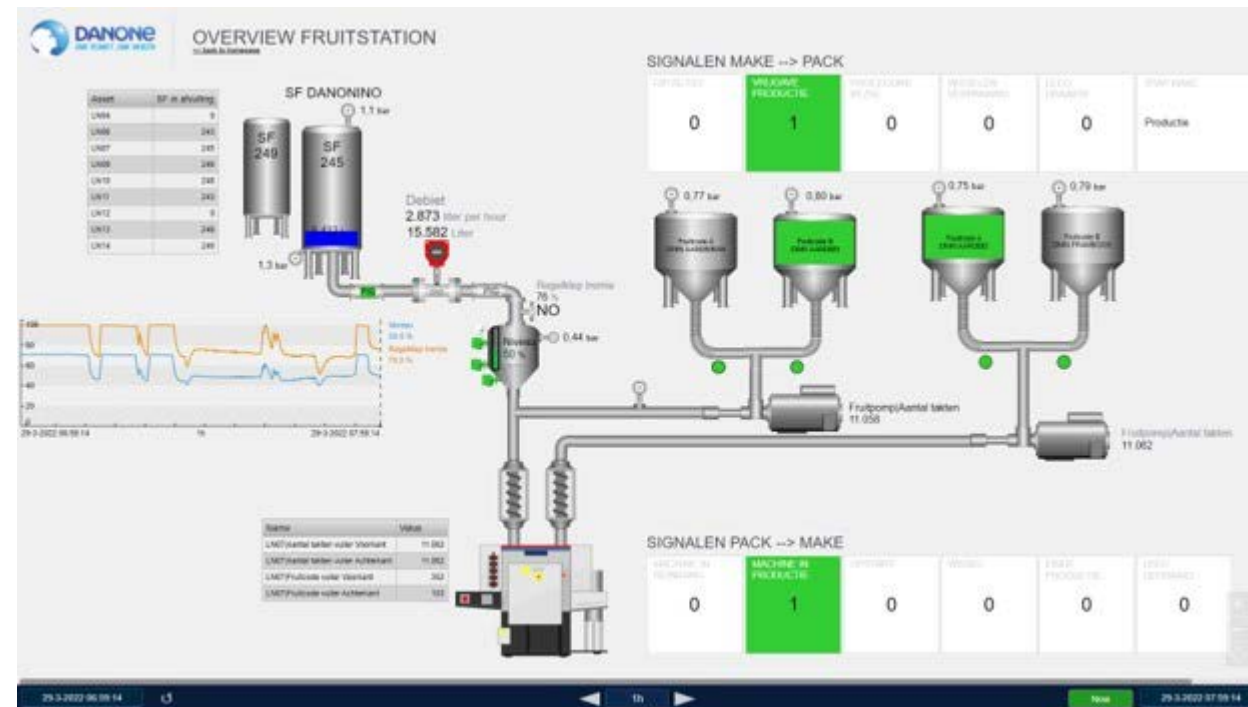
Use case 1

Use case 2

Use case ...



Global data foundation first for project acceleration

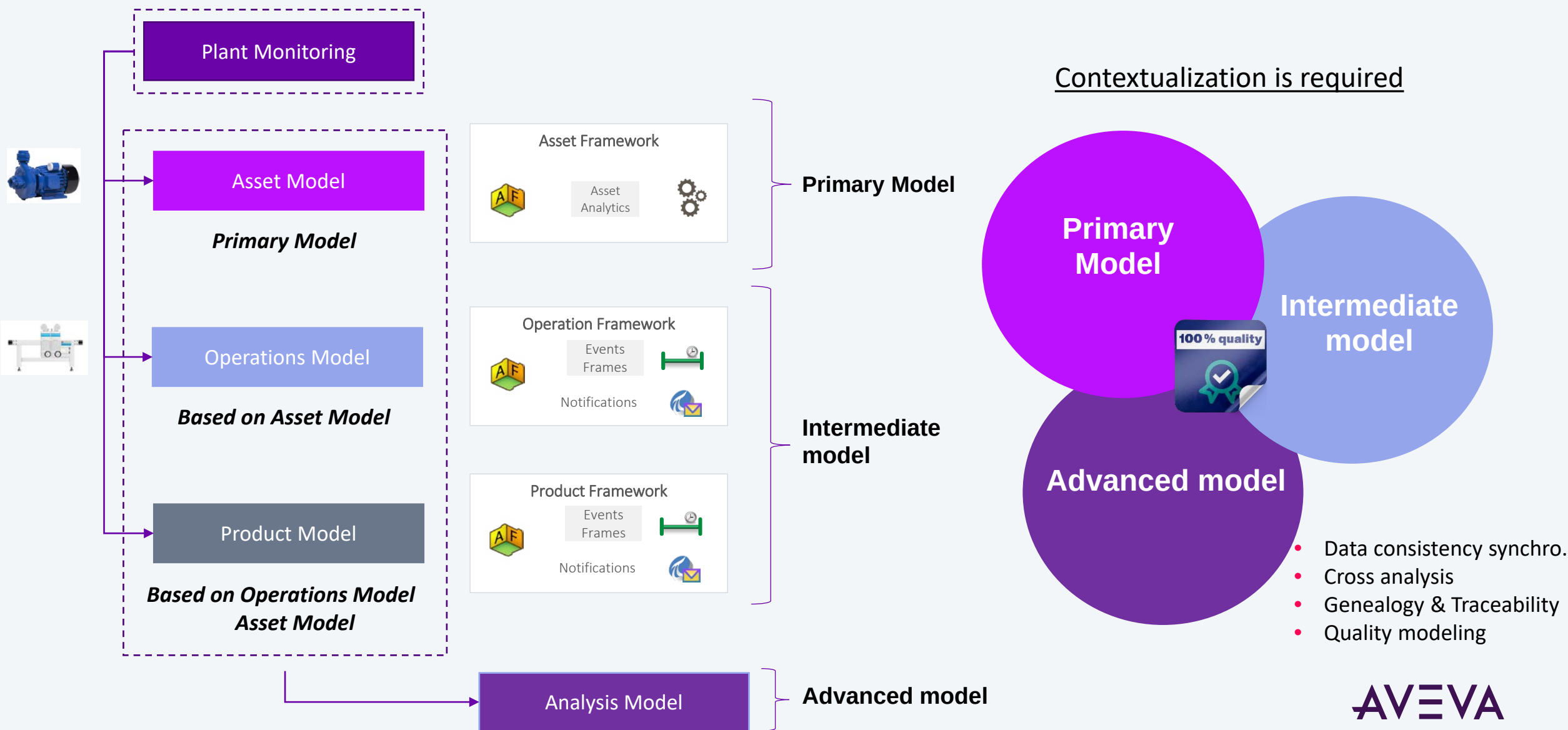


Site autonomy to build use cases (based on Foundation)

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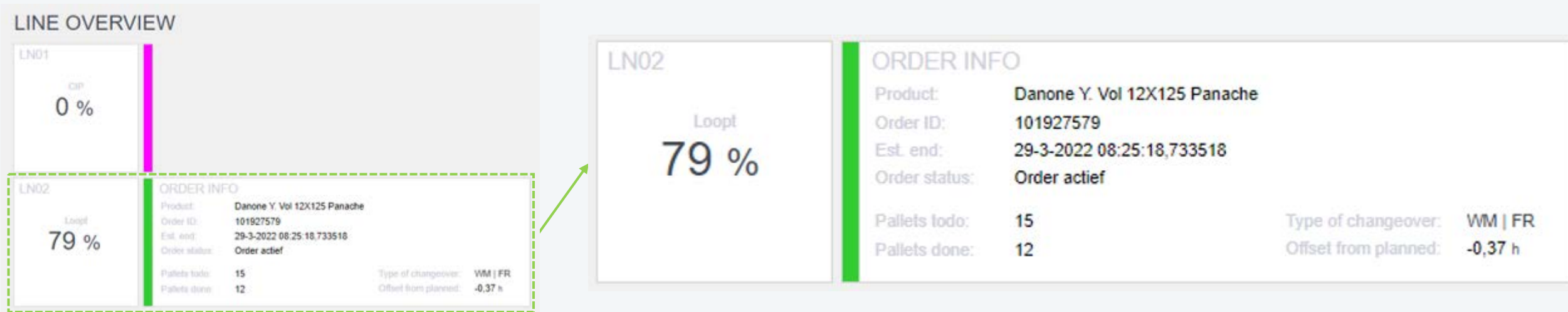
Data model: Next steps





Use cases

Use case: Consolidated order view



Problem/Reason

- Once planned no updates are received
- No good view on upcoming events (e.g., changeovers or order end)

Requirements

- Show an estimated end time, taking into account any possible downtime
- Consolidate status and progress
- Show upcoming changeovers
- Show offset from planned

Result

- You can see at a glance which lines are running well and which might need attention
- Specific view for upcoming changeovers

Use case: Consolidated order view

LINE OVERVIEW

LN01	CIP 0 %	
LN02	Loop 79 %	ORDER INFO Product: Danone Y Vol 12X125 Panache Order ID: 101927579 Est. end: 29-3-2022 08:25:18.733518 Order status: Order actief Pallets todo: 15 Pallets done: 12 Type of changeover: WM FR Offset from planned: -0.37 h
LN04	Out of order + error 0 %	
LN05	Loop 16 %	ORDER INFO Product: ACTIMEL 0% STRA 4x(12x100g) UKI Order ID: 101927865 Est. end: 29-3-2022 16:36:20.852668 Order status: Order actief Pallets todo: 55 Pallets done: 9 Type of changeover: WM FR Offset from planned: 7.62 h
LN07	Loop 83 %	ORDER INFO Product: DANONINO STRA 3x(8x100g) NORD Order ID: 101927617 Est. end: 29-3-2022 09:31:22.828329 Order status: Order actief Pallets todo: 36 Pallets done: 30 Type of changeover: FR Offset from planned: 2.13 h

UPCOMING C/O (currently only for WM or FR)

LN02	Loop 79 %	ORDER INFO Product: Danone Y Vol 12X125 Panache Order ID: 101927579 Est. end: 29-3-2022 08:25:18.733518 Order status: Order actief Pallets todo: 15 Pallets done: 12 Type of changeover: WM FR Offset from planned: -0.37 h
LN07	Loop 83 %	ORDER INFO Product: DANONINO STRA 3x(8x100g) NORD Order ID: 101927617 Est. end: 29-3-2022 09:31:22.828329 Order status: Order actief Pallets todo: 36 Pallets done: 30 Type of changeover: FR Offset from planned: 2.13 h
LN10	Loop 97 %	ORDER INFO Product: ACTIMEL STRA-NATU 3x(8x100g) FR Order ID: 101927936 Est. end: 29-3-2022 08:02:07.8585 Order status: Order actief - waarschuwingdrempel bereikt Pallets todo: 10 Pallets done: 10 Type of changeover: FR Offset from planned: 2.35 h
LN14	Loop 91 %	ORDER INFO Product: ACTIMEL POMEGRANATE 6x(8x100g) DE Order ID: 101927551 Est. end: 29-3-2022 09:01:29.225973 Order status: Order actief Pallets todo: 68 Pallets done: 62 Type of changeover: FR Offset from planned: -2.32 h

Edit Collection Criteria

Database

Rotselaar Production

Search Root

000-ROTSelaar-Primary Tree/Pack

Asset Name

Asset Type

Selected

Asset Type

TPL_L1_Packaging Line

Asset Attribute

Actief Ord: >= 65

Volgende: # /

Asset Category

Number of Results

16

Asset Order

Ascending

Refresh

Use case: CIP management



Problem/Reason

- Manually search for CIP start, end time and all relevant tags
- No clue of CIP performance

Requirements

- Quick overview of all CIP's
- Highlight underperforming CIP's
- Analyze individual CIP's with very low effort

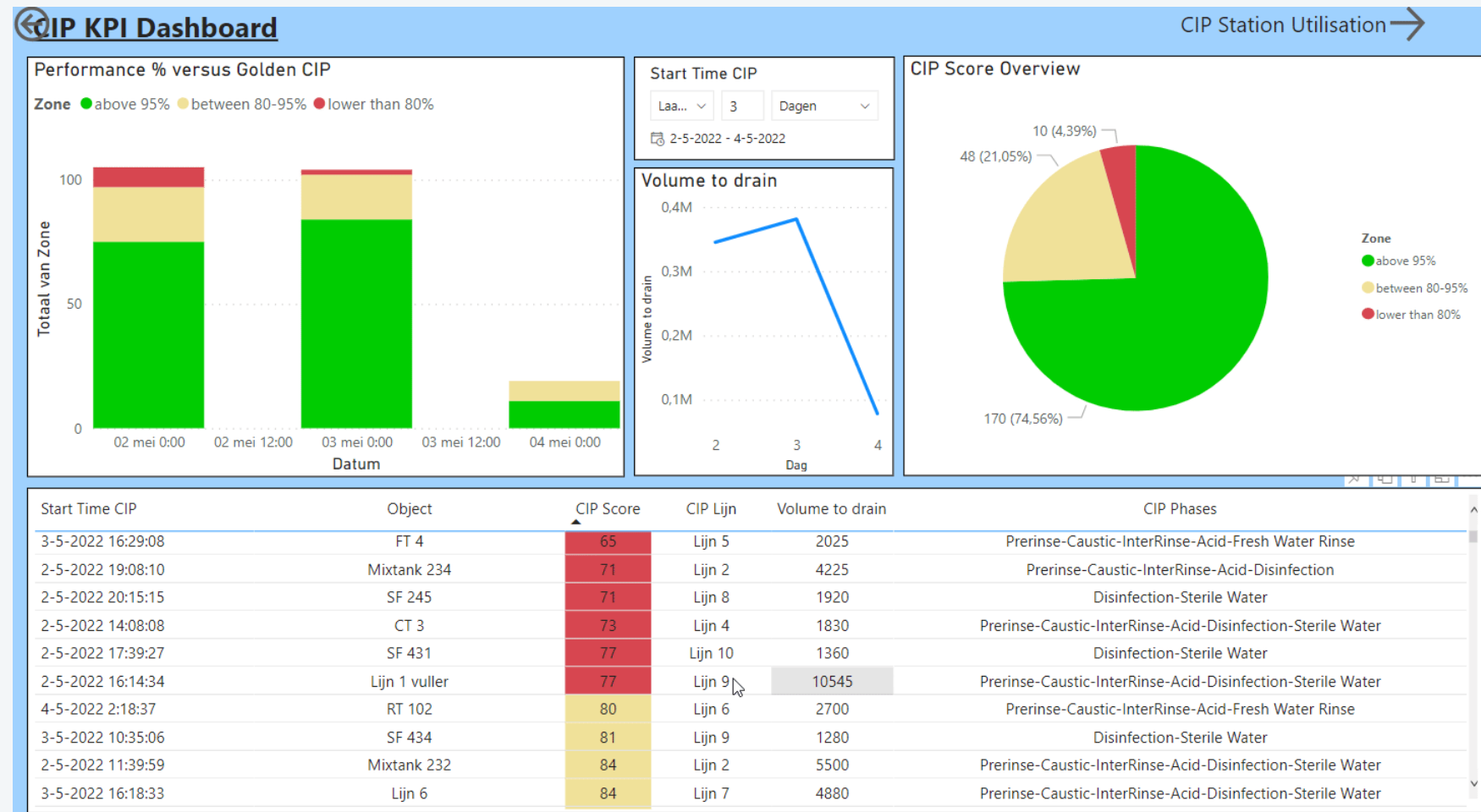
Result

- PowerBI dashboard for CIP performance reporting
- PI Vision to analyze CIP's in detail

Use case: CIP management

PowerBI dashboard for CIP performance reporting

- Overview of CIP performance based on CIP score
- Monitor losses
- Drill through into individual object trends



Use case: CIP management

PowerBI dashboard for CIP performance reporting

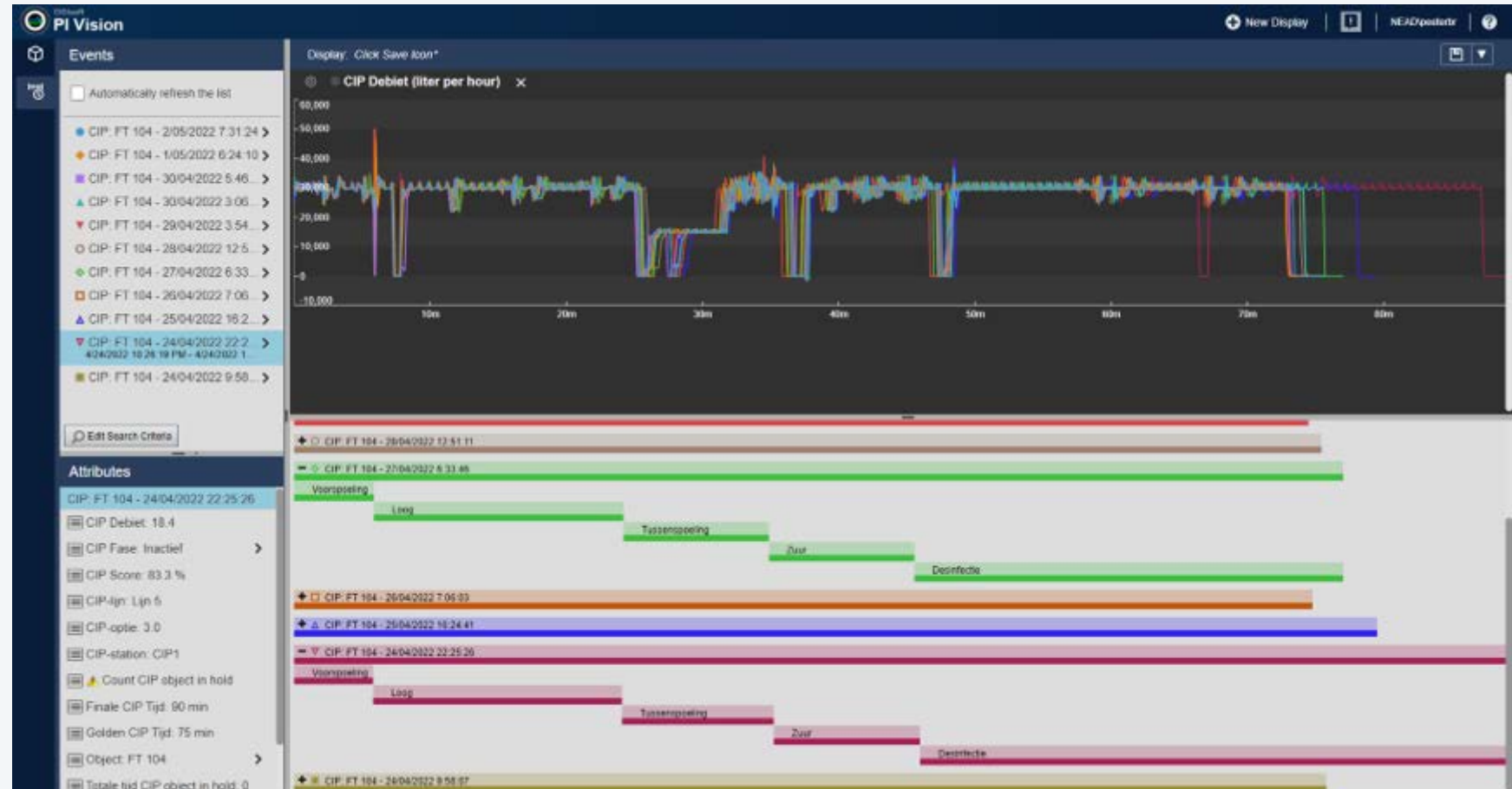
- Overview of CIP execution
- Quickly visualize issues with CIP Station



Use case: CIP management

PI Vision to analyze CIP's in detail

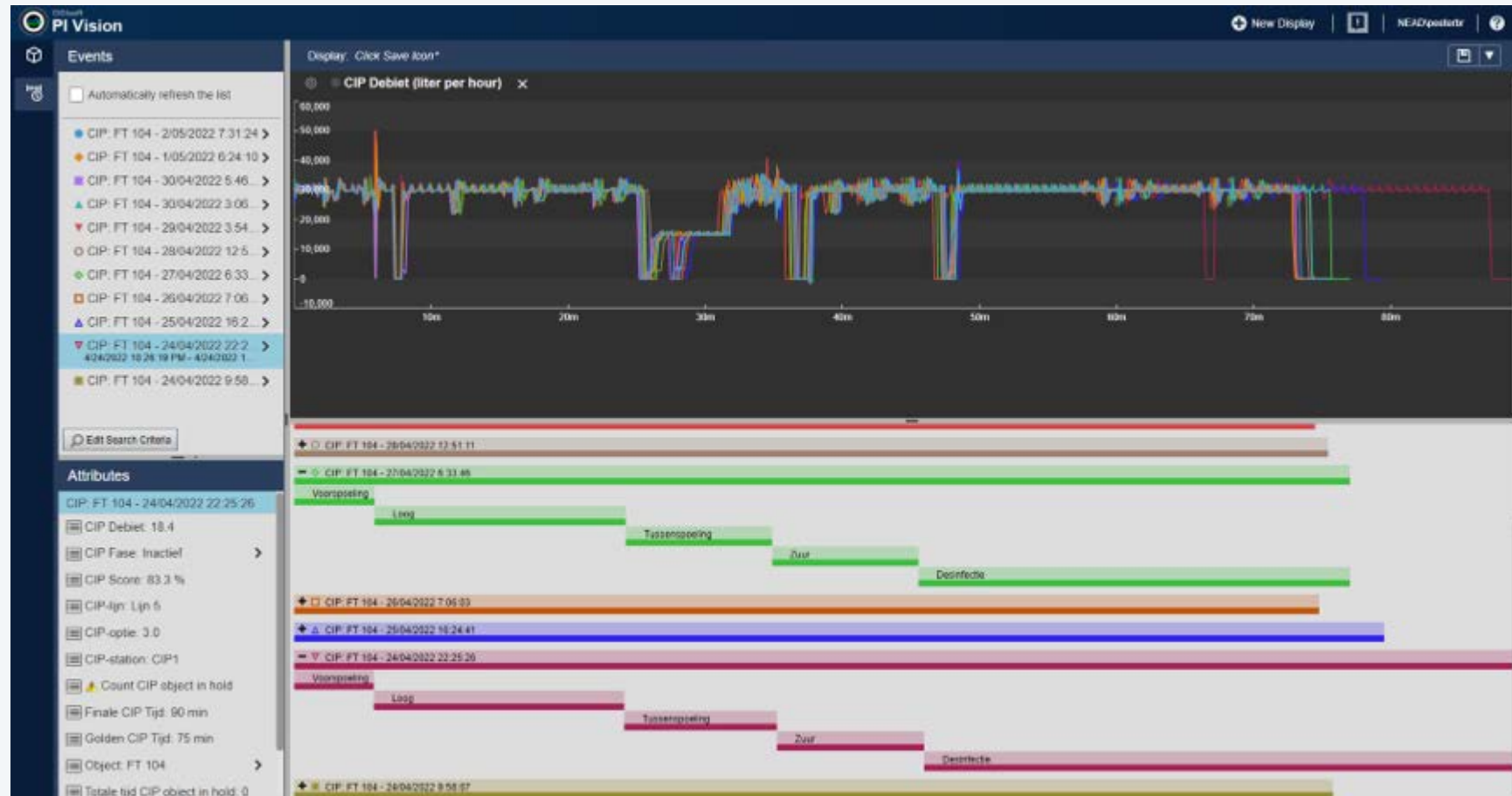
- Event comparison
- CIP phases as child event frames



Use case: CIP management

PI Vision to analyze CIP's in detail

- Individual CIPs
- CIP phases as child event frames



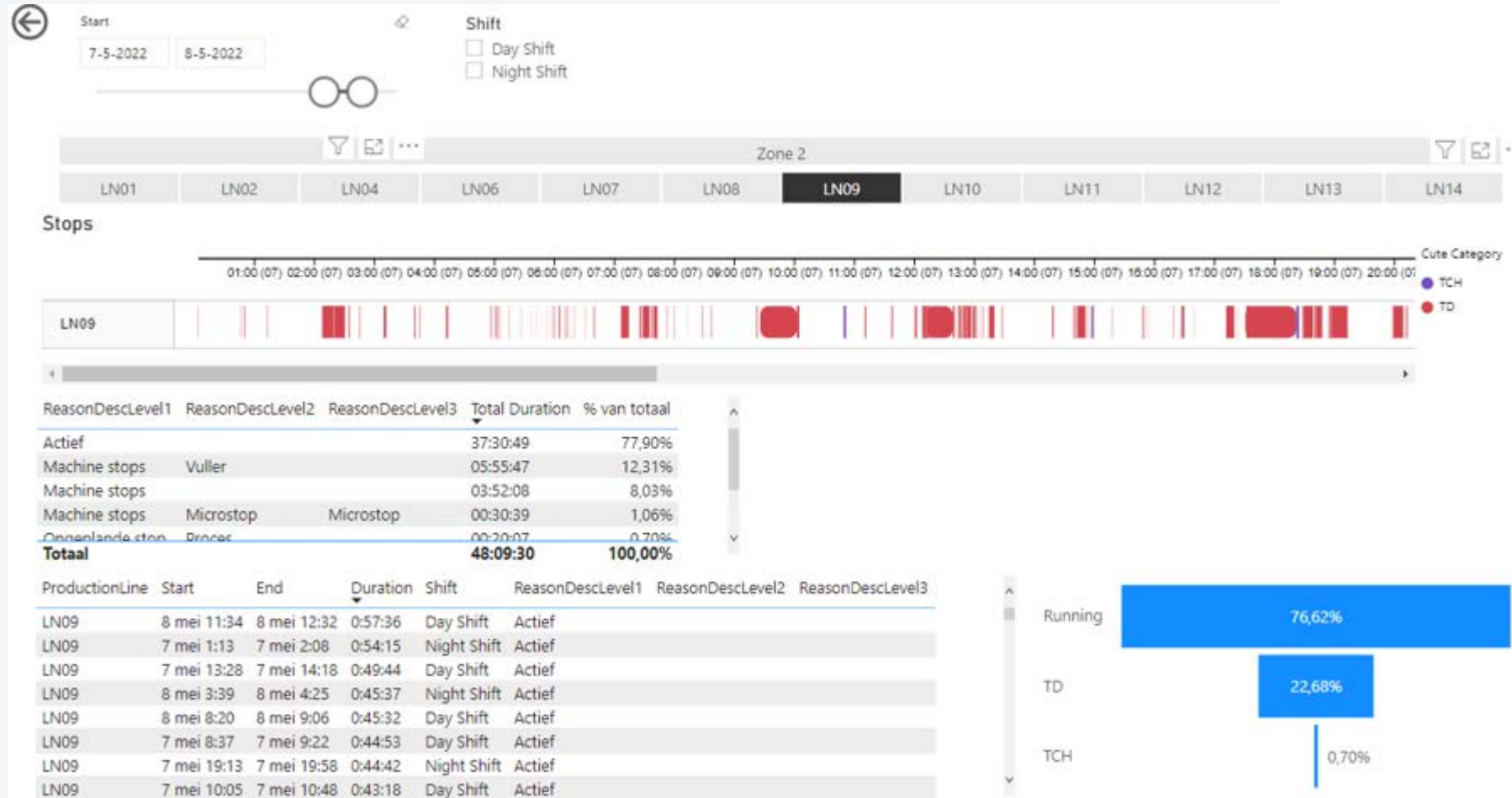
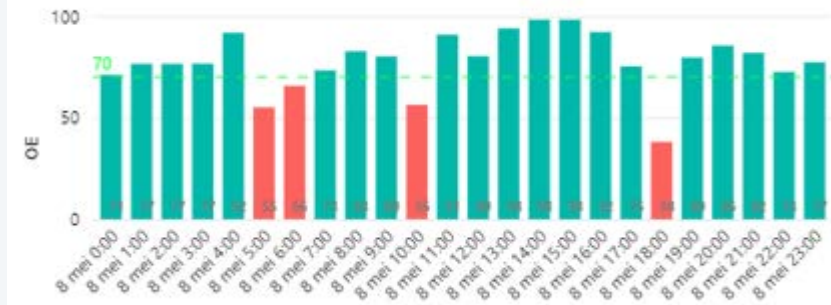


- ## Requirements

- ## Result

- AVEVA

Use case: OEE application





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Questions?

Please wait for the microphone

- State your name and company



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