



Optimizing industrial wastewater treatment units with real-time monitoring and predictive analytics



INOPSYS



WATER & WASTE



COMPANION



2024

CONTEXT & CHALLENGE

Inopsys specializes in circular chemistry, providing on-site mobile and modular solutions for the chemical and pharmaceutical industries to purify water or solvents while recovering valuable components. Each container is equipped with various elements like pumps, heat exchangers, and tanks, which require efficient operation and maintenance.

Challenges included:

- **Consolidating data** across multiple containers and using it for process improvement.
- **Visualizing data** effectively for operators to manage increasing container fleets.
- Detecting and addressing **fouling in heat exchangers** to prevent inefficiencies and damage.



These challenges can be tackled by:

- **Streamlining Operations:** Real-time monitoring and visualization enhance process understanding and decision-making.
- **Reducing Downtime:** Predictive models for anomaly detection in **heat exchangers** enable proactive maintenance, minimizing disruptions.
- **Improving Customer Satisfaction:** Efficient container operations maintain **Inopsys's reputation** for delivering reliable, sustainable solutions.

PROJECT OBJECTIVES

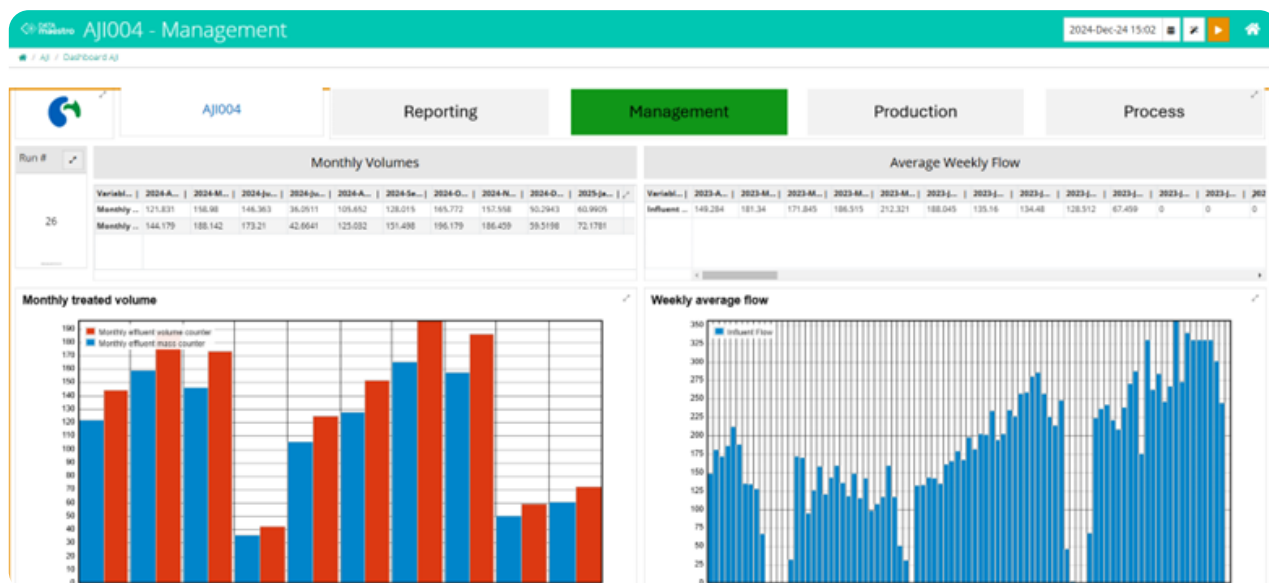
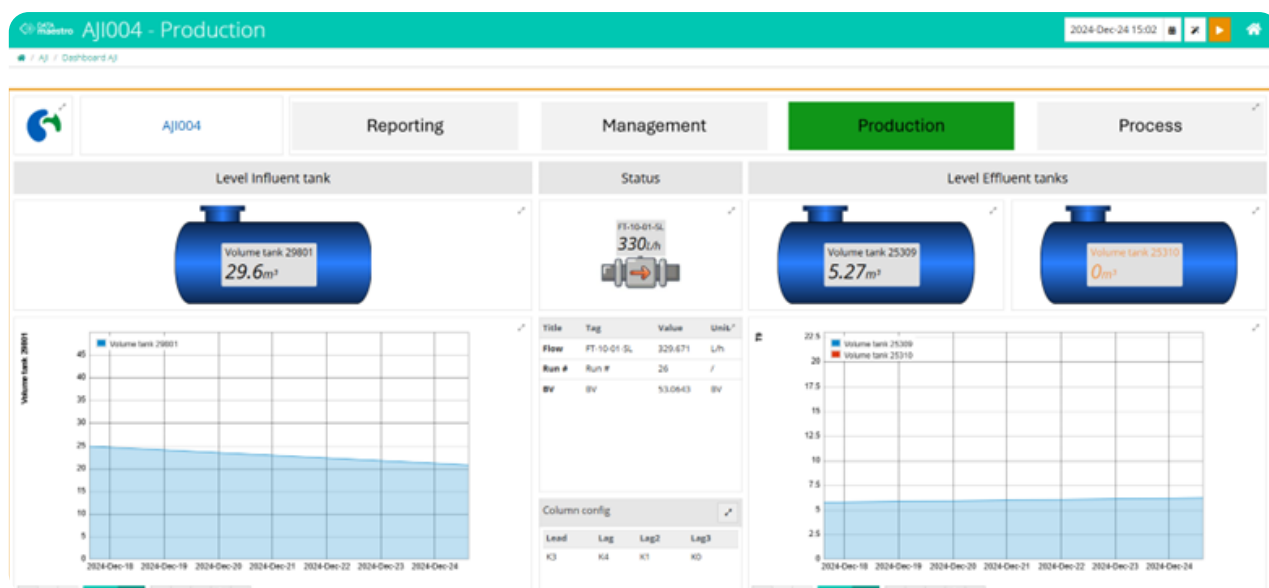
- Establish **real-time monitoring** for each container to **visualize operations** and improve process comprehension.
- Develop and validate a **predictive model** to detect **fouling in heat exchangers** using historical data.



SOLUTIONS PROVIDED BY DATamaestro

Using **advanced analytics**, PEPITe implemented the following solutions:

- **Real-Time KPIs and Features:** Generated **key performance indicators** within the DATamaestro Lake environment to support decision-making.
- **Fouling Detection Model:** Developed a model to identify and predict **heat exchanger fouling**, enabling operators to promptly take corrective action.



Methodology Applied:

The client successfully used DATAMAESTRO independently after receiving only limited training and coaching from us, a result of the structured approach provided by the **OPTIMAESTRO methodology**.

Technologies Used:

- **DATAMAESTRO Lake:** Real-time data storage and KPI calculations.
- **DATAMAESTRO Analytics:** Used for predictive modeling, including algorithms like linear regression, extra trees, neural network, and decision trees.
- **DATAMAESTRO Dashboards:** Provided monitoring and consolidated visualizations for easy operator use.

RESULTS & BENEFITS

QUALITATIVE BENEFITS



Improved Process Visibility

Real-time dashboards enable operators to monitor container operations efficiently, improving decision-making.



Enhanced Operational Understanding

Better insights into process flow help engineers identify and address inefficiencies more effectively.



Reduced Maintenance Disruptions

Predictive fouling detection minimizes downtime and ensures smoother container operations.

CONCLUSION & FUTURE OPPORTUNITIES



Key success summary:

- Successfully piloted the solution on a single container, demonstrating scalability to other units.
- Delivered actionable insights and tools for improved process management and predictive maintenance.

Next steps:

Expand deployment to additional containers and optimize models for broader use cases.

