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Facilitating Digitalization in Extra-Small Cargill Facilities using Edge Data Store

Anmol Sharma, Richard Lopes, Salil Rege

AVEVA

Salil Rege

ANH Americas Smart Manufacturing Leader

- Cargill
- salil_rege@cargill.com

Anmol Sharma

Senior Architect

- Cargill
- anmol_sharma@cargill.com

Richard Lopes

Regional Architect

- Cargill
- Richard_lopes@cargill.com

About Cargill

Cargill® Helping the world *thrive*

Our purpose is to nourish the world in a safe, responsible and sustainable way.

At a glance

160,000 employees

Working in 70 countries

More than 158 years of experience

A trusted partner for food, agriculture, financial and industrial customers in more than 125 countries.

Agriculture

Food

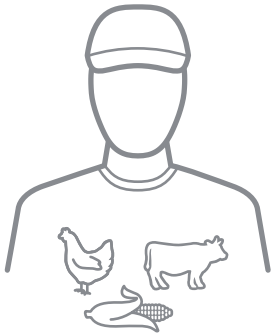
Animal nutrition and protein

Financial and industrial

Fiscal 2023 revenue: $177B

AVEVA

Our Business



For farmers

We supply feeds, other inputs and expertise to farmers, and buy crops and livestock from them

We provide insights to our partners

Data analytics | Market expertise | Risk management | Financial solutions

We transform raw materials into finished goods

Animal nutrition | Food ingredients | Animal protein | Branded foods | Bioindustrials

We move products around the world

Roads | Rail | Rivers | Oceans

For customers

We deliver finished goods to customers in the foodservice, retail, consumer packaged goods and industrial sectors

Cargill Helping the world thrive

AVEVA

Business Challenge

Problem Statement – Cargill uses conventional PI solution at ~220 plants globally but did not have historian solution for ~400 extra-small facilities (e.g. grain elevators, protein processing plants, feed mills, shipping ports/terminals, ships, etc.)

COST

- These Cargill manufacturing facilities with extra-small footprint cannot justify the high investment in conventional PI server systems.
- Cargill was not able to digitalize data acquisition at these small plants without significant investment. This prevented driving value from data at these sites.

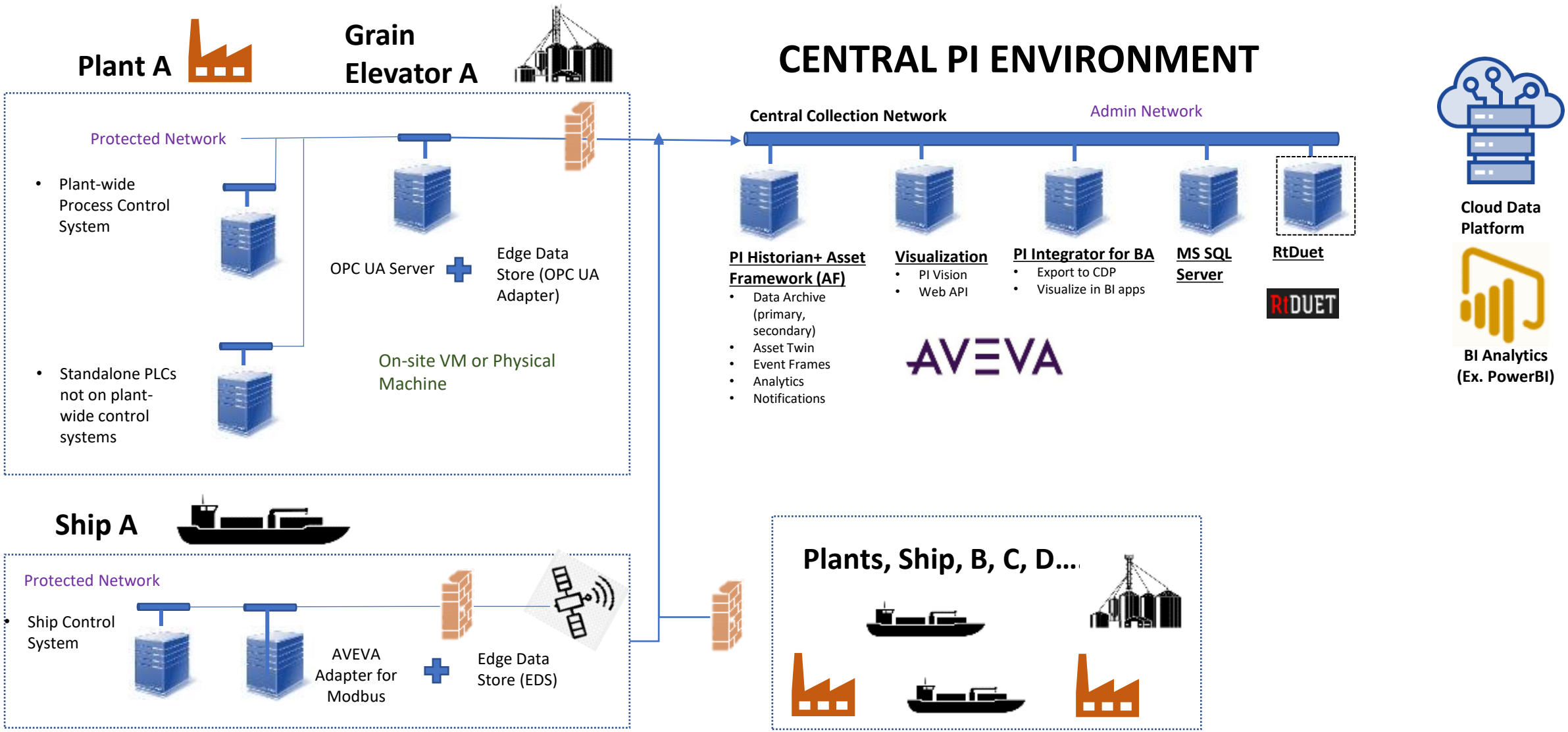
INFRASTRUCTURE

- Such small sites lack the infrastructure or automation/IT resources to sustain local PI servers.
- The business has a wide variety of automation infrastructure, PLC vendors and technology. There is a need to use a common solution across plants with different process control systems (PCS) for easy centralized maintenance and support.

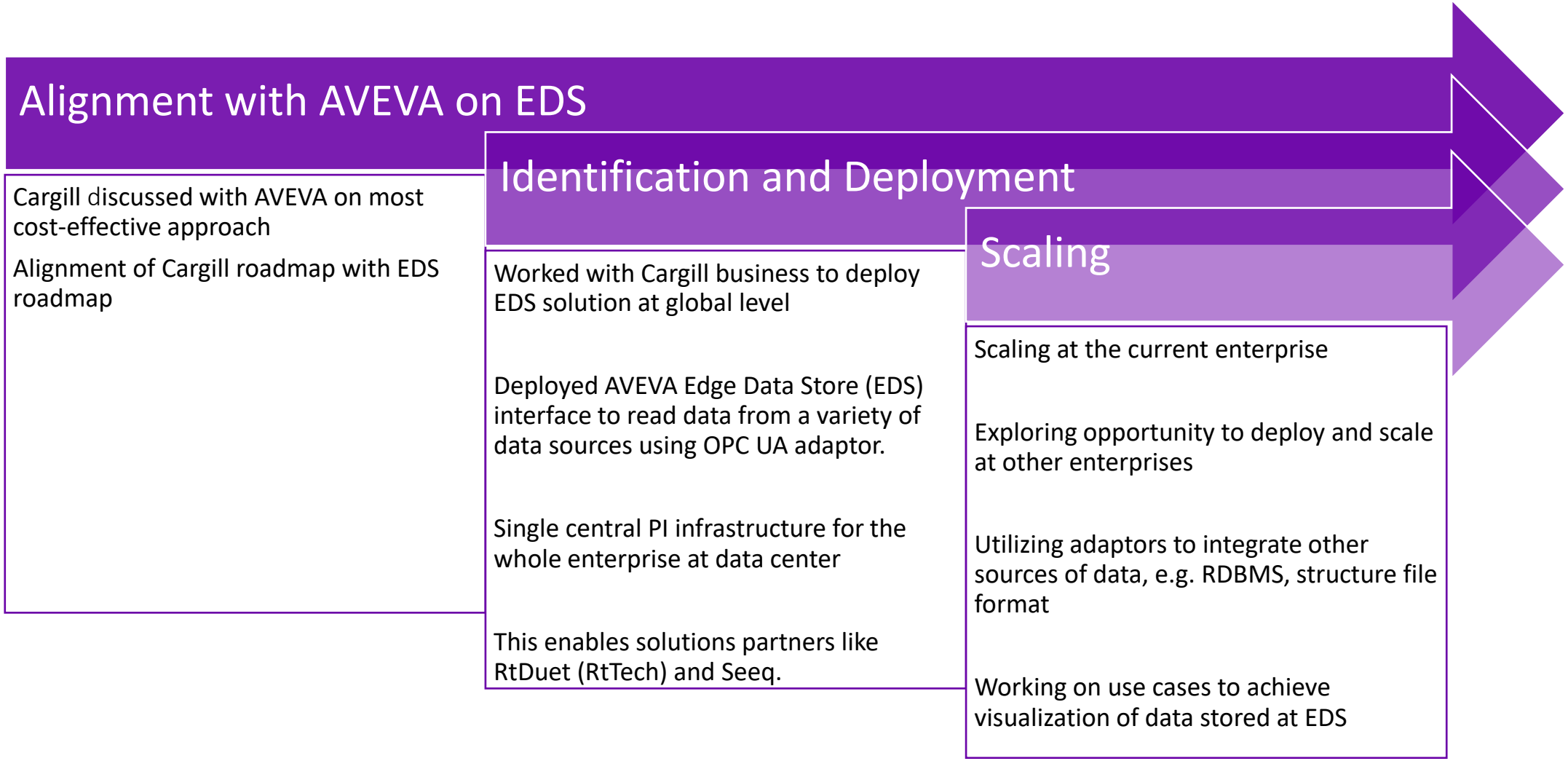
DIFFERENT SOURCES

- There is a business need to connect to a variety of data sources such as PLC (control systems) data, structured files, SQL data, etc.

AVEVA Edge Data Store Use Case (Solution):

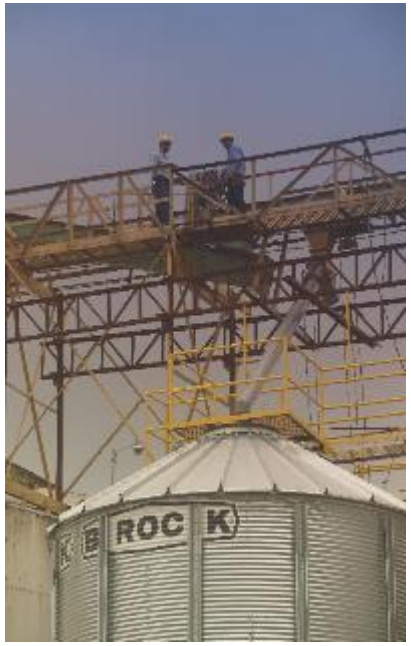


Implementation Details



Cargill Facilities Benefiting from EDS

Feed Mills



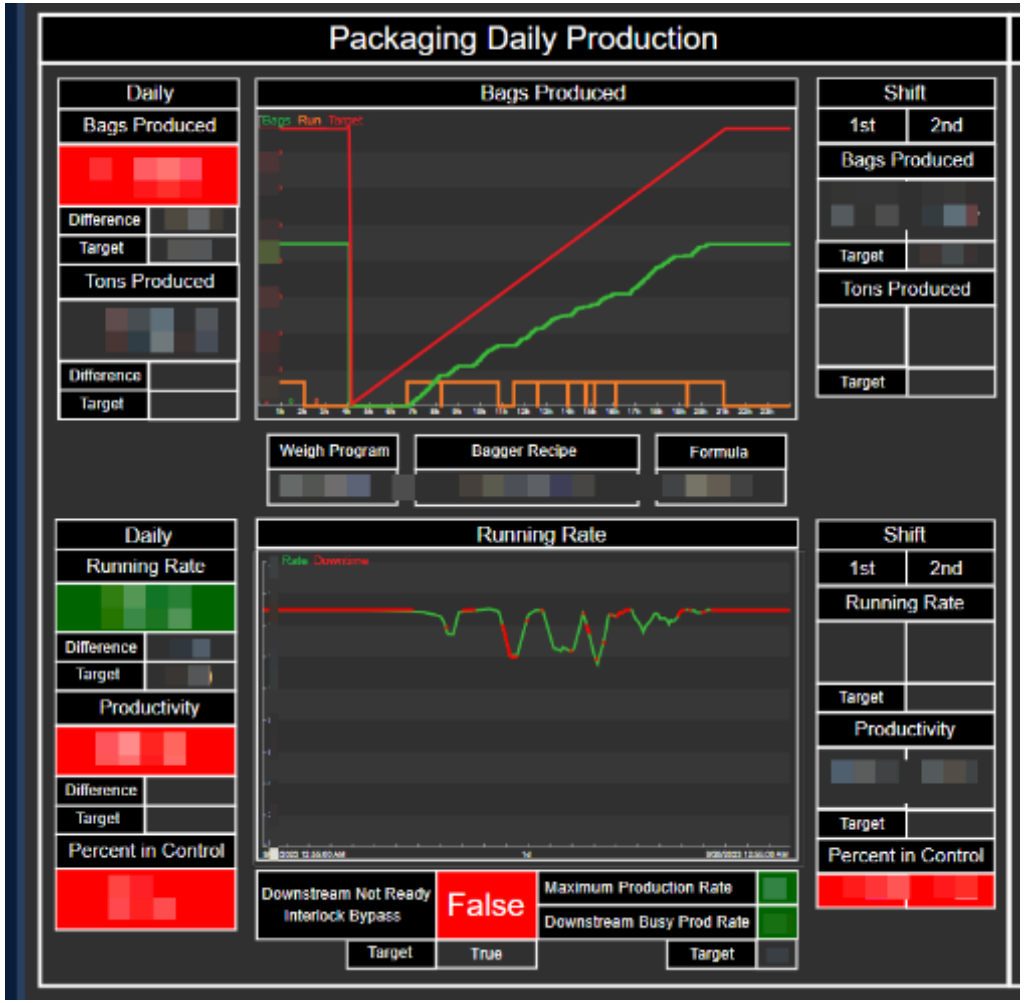
Grain Elevators

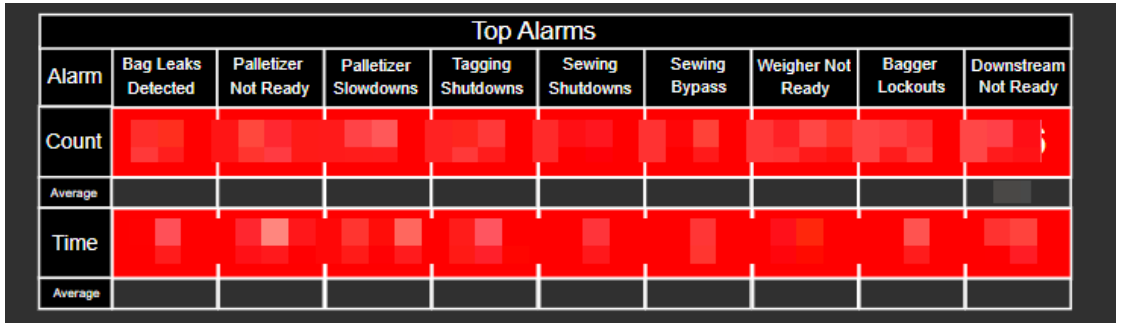
Transport Ships/ Port Terminals

Small Meat Processors

SUCCESS STORIES/DASHBOARDS

Ensure Productivity is on Target

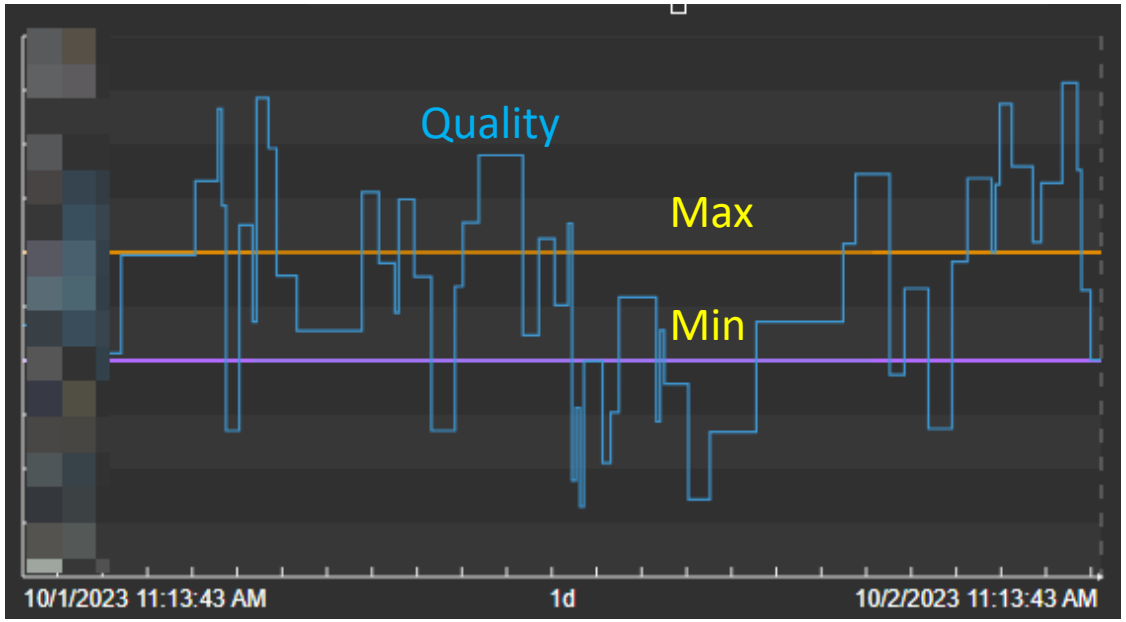




- PI EDS at a packaging line monitored KPIs such as production vs. target, bags/min, downtime etc. vs. target in real-time.
- Alarm information provides root-cause analysis into main causes for low productivity
- PI helped identify some downstream bottlenecks which can be addressed using some control programming changes

SUCCESS STORIES/DASHBOARDS

Monitor Quality and Avoid Excess Giveaway

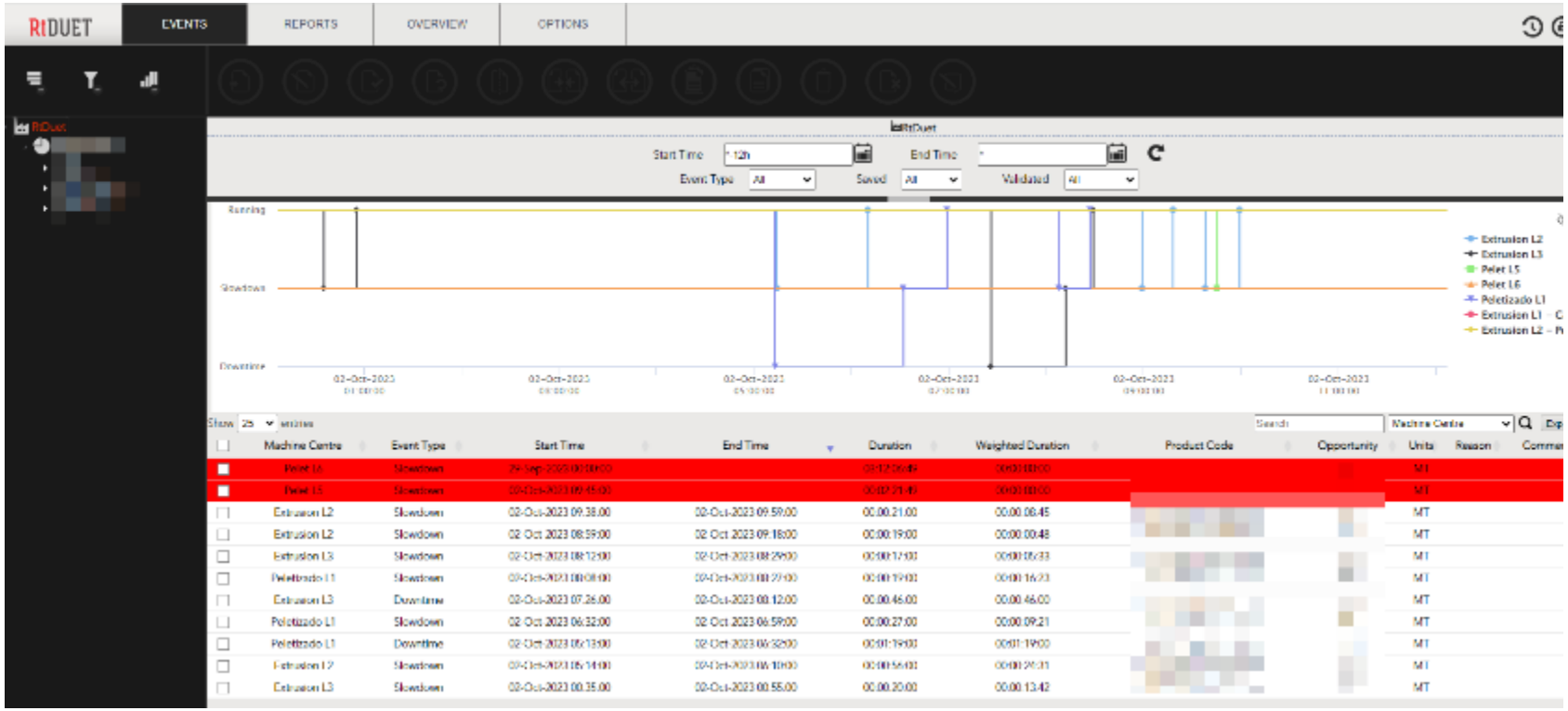


Quality Measurement

- A plant implemented an automated sampling and quality measurement instrument
- EDS ingested JSON files from the instrument using AVEVA Structured Data File adapter and created PI tags
- Plant operators were able to monitor lab quality in real-time along with process data and make necessary adjustments
- PI also enabled remote experts to view data and suggest improvements

Downtime Tracking

Overall Equipment Effectiveness (OEE)



RtDuet

- PI enabled automatic downtime tracking and reason-coding to track downtime and slowdowns for daily continuous improvement

Solution Meets Business Needs

COST EFFECTIVE

- Implemented PI data acquisition at very small facilities cost effectively.
- The traditional PI implementation at Cargill did not financially suit the extra-small sites.

MINIMAL ARCHITECTURE

- Standardized the architecture to avoid siloed implementation.
- Sustainable design with minimal footprint which is easy to run and maintain.
- Centralized environment allows easy data comparison across multiple sites.

EASE OF INTEGRATION

- Data can be contextualized at single AF and consumed by visualization and analytical applications.
- Could build a standard system architecture and data model that could be easily leveraged to multiple facilities.

Learnings from EDS Implementation

Comparison of EDS vs. PI Interfaces + Data Historian

- Edge Data Store is **complementary to PI System** for select use cases to bring edge data to the cloud
- **Different configuration requirements** for PI interfaces vs Edge Data Store and other AVEVA Adapters
- Edge Data Store is a **newer product** with regular enhancements
- **Additional learning resources** needed for Edge Data Store and AVEVA Adapters

AGRIFOOD COMPANY

Cargill Digitalizes its Extra-Small Manufacturing Facilities

Challenge

- Extra small facilities such as feed mills, grain elevators, meat processing plants, ships, port terminals etc. are not digitally mature
- Such sites cannot justify the cost of conventional PI server systems at sites as they only have a few hundred tags.
- Small sites do not have the automation or IT resources on site to sustain the local PI servers

Solution

- Deployed AVEVA™ Edge Data Store™ at small facilities to send data to a central PI environment.
- A variety of data sources such as OPC UA, structured files, etc., can be read using AVEVA PI Adapters.

Results

- PI data acquisition was deployed at extra-small facilities very cost effectively.
- Data architecture could be standardized allowing rapid scaling to more facilities.
- PI EDS has flexibility to connect to a variety of data sources such as OPC UA and MODBUS
- In combination with PI adapters, other type of data was integrated

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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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