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Enhancing Operational Insight with AVEVA PI System and FactoryTalk[®] Historian

A Co-Presentation by The Doe Run Company and Gray Solutions

Presented By: David Boren & Keith Bouvier

AVEVA

The Doe Run Company

158 Years as a Responsible Mining & Metal Production Company

- Located in Southeast Missouri, our mines deliver lead, copper and zinc concentrates across the globe
- One of the largest lead mining districts in the world
- Provide metal fabrication through our Seafab Metals Company subsidiary
- Operate one of the world's largest single-site lead battery recycling plants



Gray Solutions

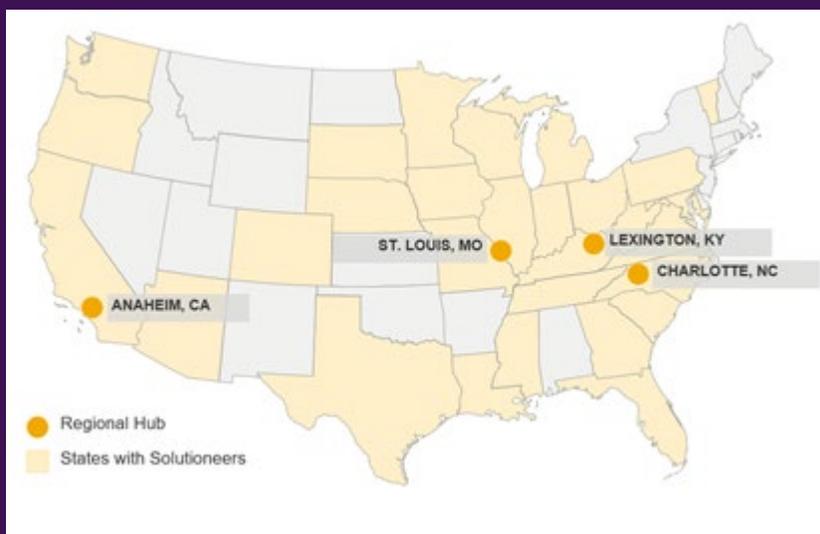
A GRAY COMPANY



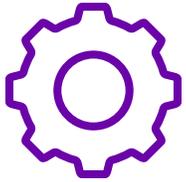
Gray Solutions

Trusted Advisors delivering Outcome Based Solutions through Deep Collaboration and Lasting Partnerships, while providing Fulfilling Team Experiences

- Gray Solutions is part of the Gray, Inc. family of companies which provides EPMC services
- Gray Solutions is made up of 300+ Full Time Solutioneers.
- Our Services and Capabilities Overview
 - Consulting and Front-End Engineering Design (FEED) – DT/MES/MOM Strategy
 - Automation & Controls
 - Digital Transformation – MES/MOM,OEE/Performance, Manufacturing Intelligence
 - OT Infrastructure Services – Network Design, Optimization, and Cyber Security
 - Advanced Automation – Robotics, Advanced Vision Systems, AMR/AGV
 - Process Design – Process Packaging and Material Handling Integration
 - Turnkey Project Implementation



Revolutionizing Operational Insight



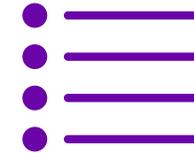
Challenge

- Desire for modernized and more accessible operational data systems that expand personnel's ability to extract, visualize, report and analyze data



Solution

- Deployment of AVEVA PI Systems, to include AF, Vision and Asset Analytics
- Introduction of AF and Asset Analytics to existing FactoryTalk® Historians
- Deployment of custom applications leveraging AF SDK and PI Web API to collect manually entered data and send automated DataLink reports



Benefits

- Enhanced availability of operational data, driving proactive decision making
- Decreased reliance on manual data collection processes and an increased reliance on automated data collection
- Utilization and acceptance of visualization tools by operational personnel

The Challenge

- Accessible real time and historical process data for decision making for all personnel
- Independent FactoryTalk® Historian systems with no AF Asset Model limits data enhancement capabilities
- Environmental systems fed by multiple middleware software
- Enhance methods of process data collection, analyzing, and reporting
- Desire to monitor system utilization (CBM) and track systems downtime (OEE)



Solutions Leveraging AVEVA Technology

Providing Data To Those That Need It Most

Leveraging Architecture

- Expansion of data collection to various processes in our areas of operation
- Implemented an AF Asset Model in existing FactoryTalk® Historian systems
- Leveraged PI OLEDB to create a source table for existing environmental visualization tools
- The introduction of PI Vision with our Corporate AVEVA PI System allowed us to access data in our existing FactoryTalk® Historian systems

Leveraging Value Added

- Created a web-based application to configure automated scheduling of DataLink reports
- Built a web based manual data entry solution
- Set up integrations with PI Vision and Event Frames in order to track, annotate and report on various system downtime and excursions
- Designed Condition Based Monitoring functionality

Crusher Downtime Tracking

Downtime

Asset	Auto	Running	Manual	Cycle Stop Requested	System Maintenance	System Fault
System Status	Auto	Running	Not Manual	Disabled		
Event Name	Start Time	End Time	Duration	Reason	Acknowledgment	Acknowledged By
	10/31/2022 2:07:07 PM	10/31/2022 2:14:35 PM				
	10/31/2022 7:50:18 PM	10/31/2022 8:01:00 PM				
	11/1/2022 1:10:50 AM	11/1/2022 1:10:50 AM				

Crusher Downtime

Asset	Running					
Crusher Run Status	Running					
Event Name	Start Time	End Time	Reason	Acknowledgment	Acknowledged By	Duration
Crusher Downtime 2022-10-	10/31/2022 2:37:00 PM	10/31/2022 2:45:00 PM		Acknowledged		8m
		10/31/2022 3:14:00 PM		Acknowledged		21m
				Acknowledged		1h 56m
						8m
						50m

Shift Comments

Event Name	Start Time
Night Shift Comments	10/31/2022 5:00:00 PM
Day Shift Comments	10/31/2022 5:00:00 AM
Day Shift Comments	11/1/2022 5:00:00 AM

Reason Code Editor

Downtime 2022-11-01 01:10:50.003

- Reason
 - 5L
 - Feeder
 - Mine
 - RV
 - Unscheduled

Clear Apply Cancel

Maintenance System-wide Fault

Disabled Not Faulted

Reason Acknowledgment Acknowledged By

Light Fence Tripped Acknowledged

Acknowledge

Asset	Load Status
Train1	NOT LOADED
Train2	LOADED

10/31/2022 1:47:33 PM

1d

Now 11/1/2022 1:47:33 PM

Equipment Production & Downtime Report Output

Production & Downtime Tracking Report

Start Time	Y+5h+1m
End Time	T+5h+1m

Shift:	Tons:	Trips:
31-Oct-22 17:00:00		
01-Nov-22 05:00:00		
Totals		

Buick Raise Ore Bin		
Timestamp:	Tons	Level (%)
31-Oct-22 05:01:00		
31-Oct-22 17:01:00		
01-Nov-22 05:01:00		

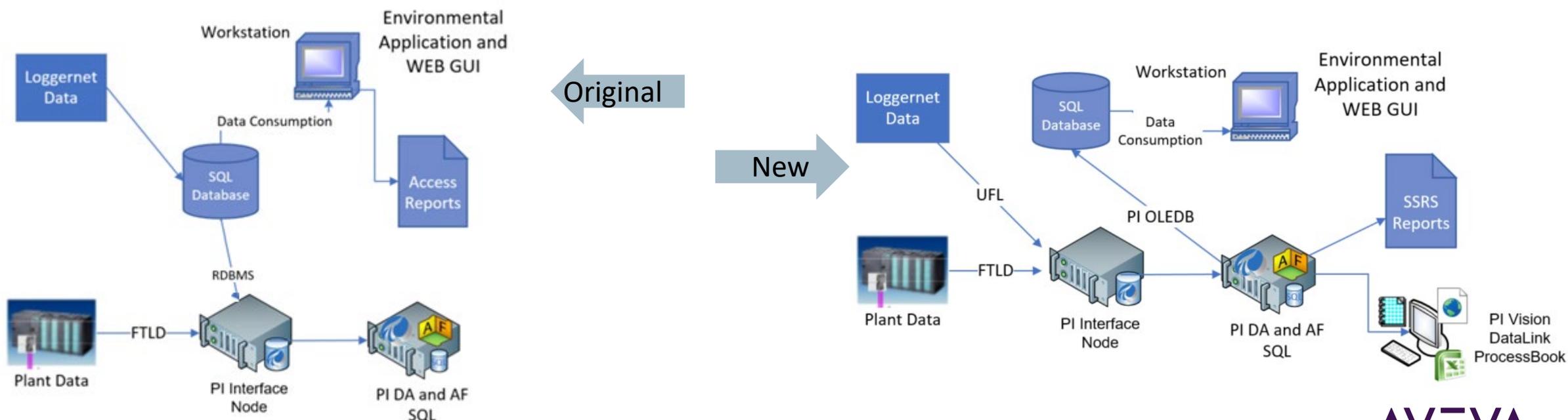
Downtime Tracking

Event name	Start time	End time	Duration	Acknowledged by	Reason	Annotations
Downtime 2022-10-30	30-Oct-22 01:29:54	31-Oct-22 08:22:14	30:52:20		Unscheduled	10/30/2022 1:35:01 AM, Notification Subscribers, 10/31/2022 8:22:22 AM, Notification Subscribers, 10/31/2022 2:12:16 PM, Notification Subscribers,
Downtime 2022-10-31	31-Oct-22 14:07:08	31-Oct-22 14:14:36	0:07:28			10/31/2022 2:14:45 PM, Notification Subscribers, 10/31/2022 7:55:28 PM, Notification Subscribers, 10/31/2022 8:01:32 PM, Notification Subscribers,
Downtime 2022-10-31	31-Oct-22 19:50:19	31-Oct-22 20:01:25	0:11:06		RV Light Fence Tripped	
Downtime 2022-11-01	01-Nov-22 01:10:50		3:58:18			11/1/2022 1:16:00 AM, Notification Subscribers, 11/1/2022 1:16:00 AM, Notification Subscribers,

Environmental Data Collection Improvements

PI as a Single Source of Truth

- PI is used as our long-term data collection mechanism instead of SQL for environmental data
- PI OLEDB is used to connect the data to SQL as an intermediate data source for existing environmental visualization tools
- Environmental data is now accessible through PI by all required consumers



“PI is a user-friendly system that has allowed our metallurgist to come up to speed on the visualization applications with at least one becoming a PI Super User developing department dashboards that trend not only our recoveries but our losses; whether the lost Pb is reported to tails or in other concentrates. **Prior to having PI System, it was a futile effort to try and coax this data from the previous systems.**”

Our metallurgical team is also developing PI Vision dashboards which mimic what control room operators view live or adjusted to a time frame of an event of interest. We are in the process of developing control charts so we can trend our key performance indicators (KPIs) to maximize profits. **In order to make improvements to our process, we had to start by measuring it. PI System has truly helped us collect our most useful information and transform it into insight.**”

S. Jayson Ripke, PhD
Chief Metallurgist

Roadmap of Additional PI System Enhancements

- Laboratory Information Management System (LIMS)
- Mobile Equipment Telemetry Data
- Maintenance Management System (MMS)
- Additional Site Automation Data
- Extend OEE Capabilities



To Conclude

Utilizing Existing Technology to it's Full Potential

- By introducing AF and its robust feature set to existing FactoryTalk® Historians, we had an immediate realization of ROI by unlocking business personnel's ability to extract, analyze and report on years of historical data
- With the introduction of a Corporate AVEVA PI Server and Vision, we unlocked the visualization potential of existing FactoryTalk® Historians
- Through targeted data collection/enhancement efforts and inter-departmental/third party team collaboration, we have streamlined our entire organization's ability to extract, analyze, visualize and report process data



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Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

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ABOUT AVEVA

AVEVA is a global leader in industrial software, sparking ingenuity to drive responsible use of the world's resources. The company's secure industrial cloud platform and applications enable businesses to harness the power of their information and improve collaboration with customers, suppliers and partners.

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. With operations around the globe, we are headquartered in Cambridge, UK and listed on the London Stock Exchange's FTSE 100.

Learn more at www.aveva.com