ROVISYS®
Automation & Information Solutions

Booth #3

OCTOBER 24, 2023

RoviSys – Your Digital Transformation Partner

Presented By: Bryan DeBois

AVEVA

Who am I?

Bryan DeBois

Director, Industrial Artificial Intelligence

RoviSys

- Over 20 years working in Manufacturing and Industrial

- Implemented projects across MES, Historian, Level 3, and Information Solutions for customers

- Direct the IAI division that executes AI, Machine Learning (ML), data infrastructure, and advanced analytics strategies

- Autonomous AI Solution Architect

- B.S. in Computer Science from the University of Akron

Phone: (330) 329-9021
bryan.debois@rovisys.com
www.linkedin.com/in/bryan-debois

ROVISYS
Automation & Information Solutions

AVEVA

S-95 Capabilities

4 — **Business Planning** & Logistics

3 — **Manufacturing Operations** & Controls

0,1,2 — **Controls Equipment** & Devices
- Batch
- Continuous
- Discrete

Interface to ERP – Level 4
- Production Schedule
- Production from Plan, Inventory update
- Production capability, performance and cost

Information Solutions – Level 3
- Production Management
- Performance Analysis
- Quality Management
- AI/ML, Analytics
- Performance Analysis – OEE, KPIs, Downtime
- Alarm management
- Real-time quality systems SPC/SQC/LIMS
- Document control, Electronic Batch Records

Automation / Process Control – Level 0, 1, 2
- Automation planning and design
- Continuous & S88 batch control integration
- Electrical and Network Design
- Instrumentation specification
- Installation /cutover engineering & management
- Testing, Commissioning & Validation
- Training/Support

ROVISYS
Automation & Information Solutions

AVEVA

Globally Located

North America

Europe

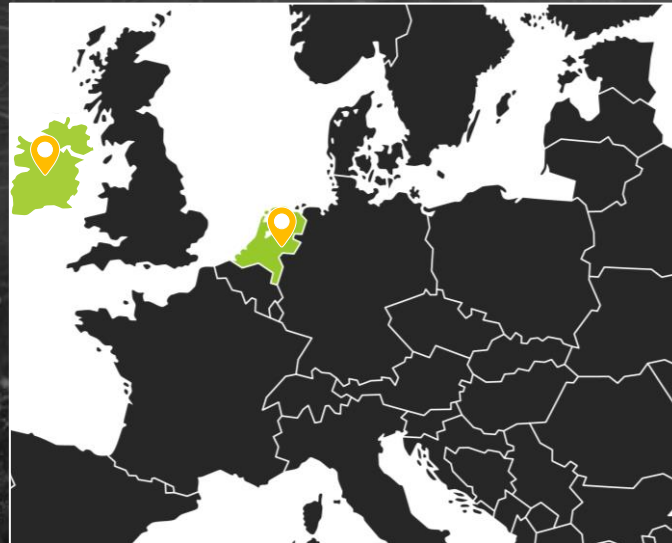Netherlands | Ireland

Asia Pacific

Singapore | Taiwan | Indonesia | Malaysia

- Aurora, OH
- Holly Springs, NC
- Southborough, MA
- Atlanta, GA
- Houston TX
- Thousand Oaks, CA
- Kalamazoo, MI
- **Columbus, OH**

14 Locations

1300+ Employees

$250MM+ Revenue

2023 Control Engineering SI Giants

2023 RANK	FIRM NAME	TOTAL SI REVENUE (USD)	TOTAL GROSS REVENUE (USD)
1	Andritz (Hardware Manufacturer)	$300,000,000	$700,000,000
2	RoviSys Largest Independent SI	$237,000,000	$296,000,000
3	Quad Plus	$203,000,000	$203,000,000
4	Fori Automation	$201,000,000	$201,000,000
5	Wood	$176,000,000	$6,426,000,000
6	Wunderlich-Malec Engineering	$149,370,900	$165,010,000
7	Barry-Wehmiller Design Group	$134,596,518	$392,865,000
8	Prime Controls	$130,429,448	$144,921,609
9	SCIO Automation	$110,000,000	$176,000,000

ROVISYS
Automation & Information Solutions

AVEVA

Industries We Serve

Chemicals	**Consumer Goods**	**Data Centers**	**District Energy, Electrical Utilities & Microgrids**	**Glass**	**Life Sciences**	**Semiconductor**
Metals & Mining	**Food & Beverage**	**Oil & Gas**	**Municipal Water & Wastewater**	**Paper & Wood Products**	**Automotive**	**Federal Solutions**

Capabilities

Manufacturing Execution Systems (MES)	Industrial Network Solutions	Industrial Artificial Intelligence (IAI)	Control Systems Integration	Warehouse Automation	Building Management Systems (BMS)

ROVISYS
Automation & Information Solutions

AVEVA

PI System Experience

✓ **LONG HISTORY**

First integration firm to install OSIsoft PI System v3.0 in 1995

✓ **EXTENSIVE PROJECT EXPERIENCE**

More than 850 projects executed over last 5 years

✓ **OSIsoft ACCREDITED ENGINEERS ON STAFF**

90+ Engineers experienced on PI System Platform, 15+ have completed OSIsoft's rigorous certification process

✓ **PREMIER PARTNER STATUS**

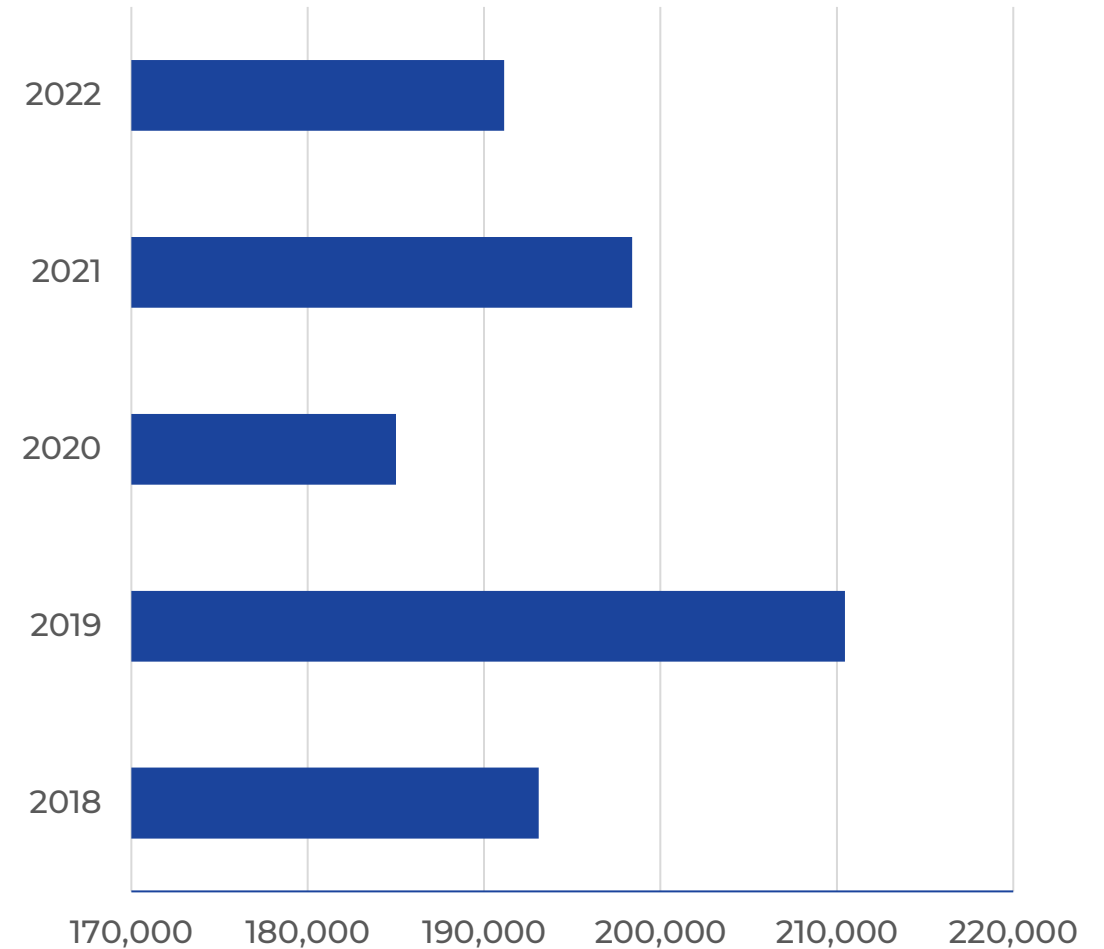First partner recognized with Select (now called Premier) status in 2016. Highest partner status available.

✓ **CONFIGURATION TO CUSTOM**

Design and deploy systems from Hundreds to Millions of tags; capable of extending functionality via Data Access tools.

Project Hours

Horizontal bar chart showing project hours by year:
- 2022: ~192,000
- 2021: ~198,000
- 2020: ~185,000
- 2019: ~210,000
- 2018: ~193,000

(x-axis: 170,000 | 180,000 | 190,000 | 200,000 | 210,000 | 220,000)

AVEVA

AVEVA Experience

✓ **ENDORSED DISTINCTION**
One of only nine CSIA Certified, Endorsed Partners in the US

✓ **CERTIFIED STAFF**
AVEVA System Platform, Historian, Application Server, InTouch

✓ **DIVERSE APPLICATIONS**
Batch Control, Continuous Control, Instrumentation, Process Visualization, SCADA, and Legacy Migration

✓ **EXTENSIVE PROJECT EXPERIENCE**
More than 150 projects executed over last 5 years

✓ **BROAD PLATFORM KNOWLEDGE**
Implemented Wonderware solutions ranging from standalone InTouch to 60k+ tag System Platform Architectures

AVEVA

AVEVA ENDORSED System Integrator | Endorsed Operate

Project Hours

Year	Hours
2022	~190,000
2021	~123,000
2020	~57,000
2019	~32,000
2018	~37,000

(x-axis: 0, 50,000, 100,000, 150,000, 200,000)

AVEVA
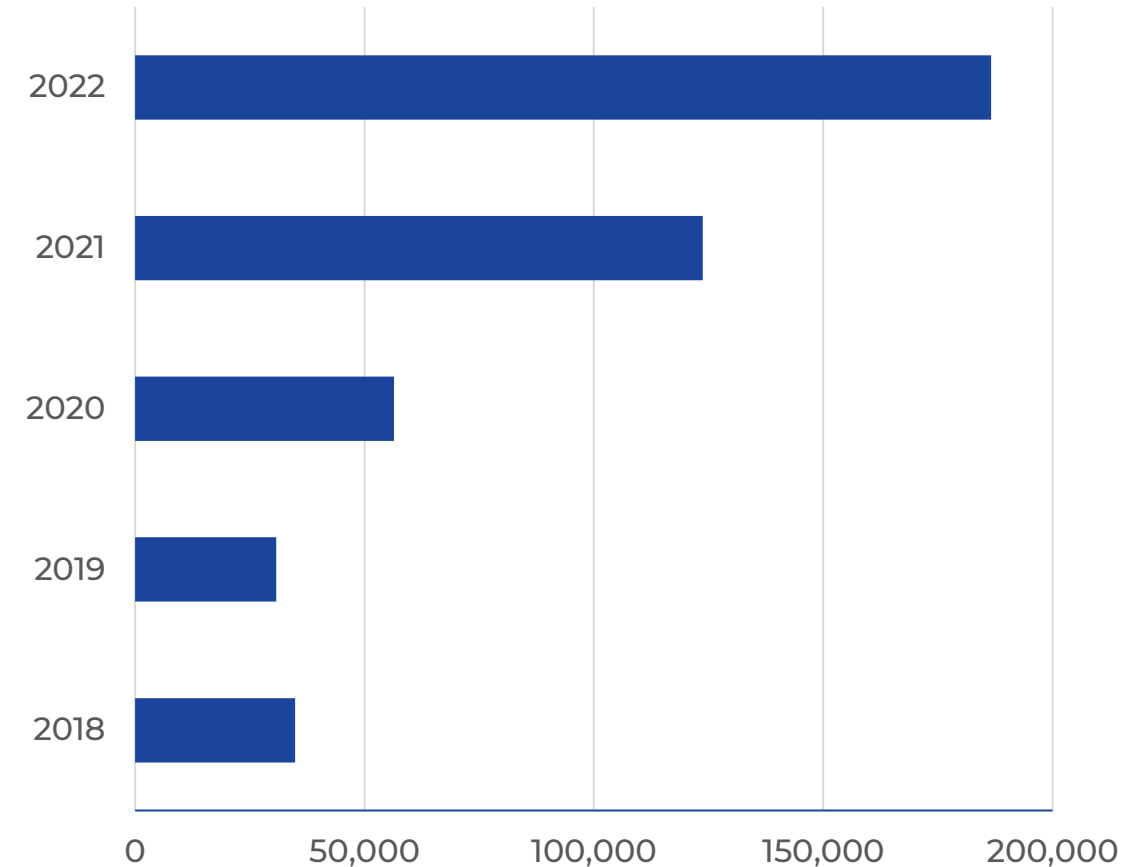
	How Can Digital Transformation Help Us?	Ready For Assessment	Execute Assessment	Ready To Start Phase One	Executing Phase One
Criteria	Desire to learn how Digital Transformation (DT) can improve your business	Do you have: • Data collection • Historian • OEE • Controls • MES	Purchased Digital Transformation Project Assessment	Proposal for Digital Transformation Project	Purchased Proposal for Digital Transformation Project
What Can RoviSys Do for You?	Digital Transformation Workshop	• Prepare you for the Assessment • Propose DT Project Assessment	Create DT Project assessment: • Requirements • Data Sources • Define processes • Improvements/KPIs • Identify ROI • Evaluate vendors	• Review Digital Transformation Project Proposal • Identify key workstreams and personnel for implementation	• Kickoff with project team • Execute project based on battle tested methodology
Your Next Steps	• Identify key projects • Identify key stakeholders	• Determine goals for DT Project • Purchase the DT Project Assessment	• Review the DT Project assessment with RoviSys • Establish your priorities for implementation	• Purchase proposed Digital Transformation Project from RoviSys	• Prioritize list of expansions and ongoing phases

RoviSys
Automation & Information Solutions

AVEVA

Use Cases

Pharmaceutical Chromatography Column - PI ACE Replacement

- Challenge
  - Currently leveraging PI ACE for Chromatography Column Transition Analysis
  - PI ACE (calculation engine) being decommissioned by vendor
  - Pharmaceutical company would like a cloud-based replacement
- Solution
  - Event-driven calculation engine deployed to the cloud reacts to events on-premises
  - AWS EventBridge routes on-prem events to the requisite calculation Lambda function in AWS
  - Results are written back down to the on-prem AVEVA PI System via the PI Web API
  - Cloud-based database provides configuration and logging (enabled/disable calculations, view calculation input/output, etc.)
  - Cloud-hosted web UI allows technicians to trigger recalculations across assets, timeframes, etc.
- Benefits
  - Flexible, configurable calculation engine
  - Additional calculations can be added to the system easily
  - Performance and reliability of cloud-based technology
  - Rolled out to three sites already and 15 chroma skids

ROVISYS

AVEVA
Automation & Information Solutions
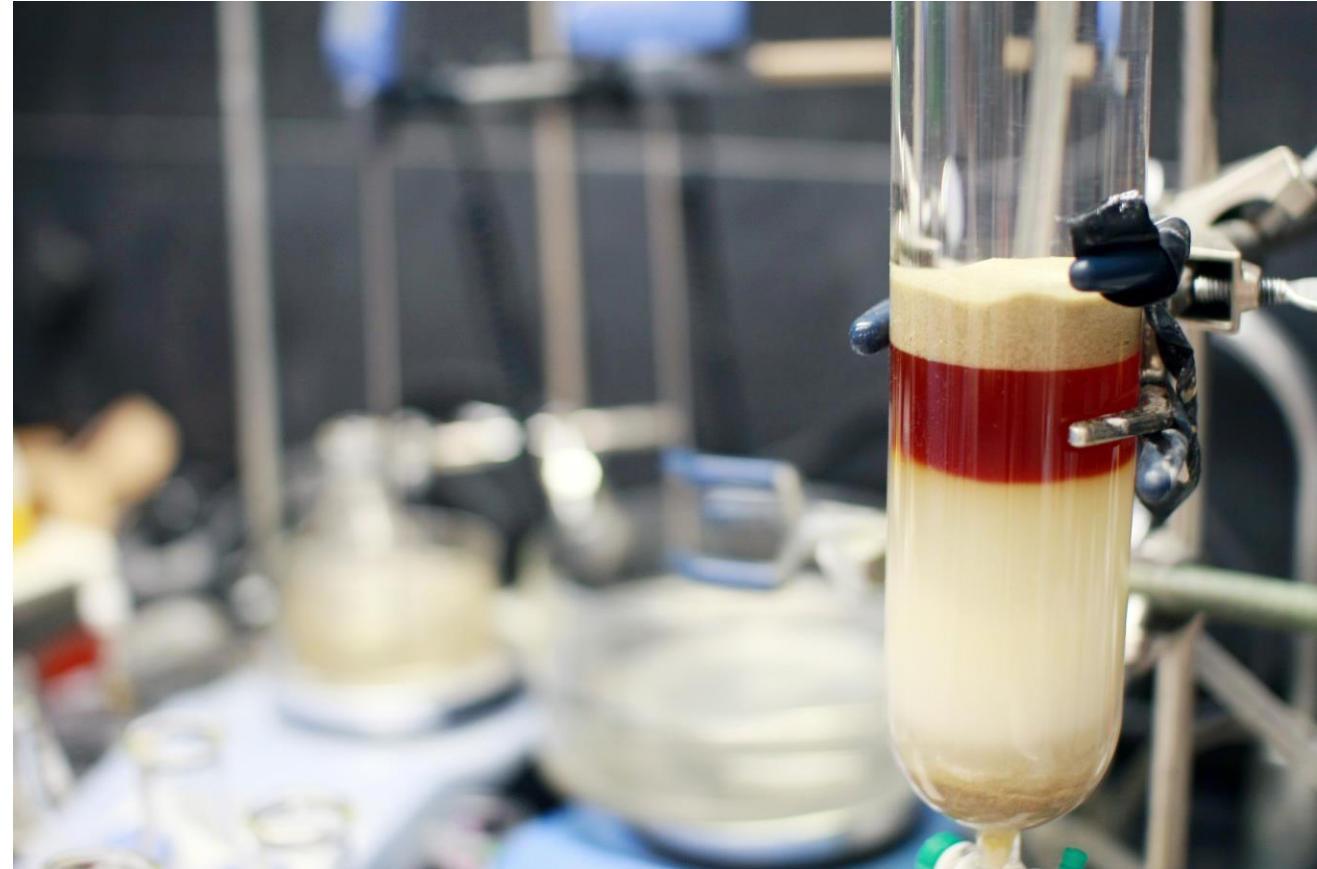
Enterprise-Wide Digital Transformation

- Challenge
  - How to stay competitive in a commodity market
- Solution
  - Implement an enterprise-wide data historian with heavy use of dashboards
  - Leverage a cloud-based predictive analytics service for rotating equipment to anticipate failures
  - Built a real-time command center for enterprise-wide collaboration
- Benefits
  - First year savings over $25 million (EBITDA)
  - One year payback on their $20-25 million investment
  - Improved asset reliability, gas plant operation, & division coordination

The Integrated Collaboration Center (ICC)
Business Transformation In Action: Operations of the Future - Now
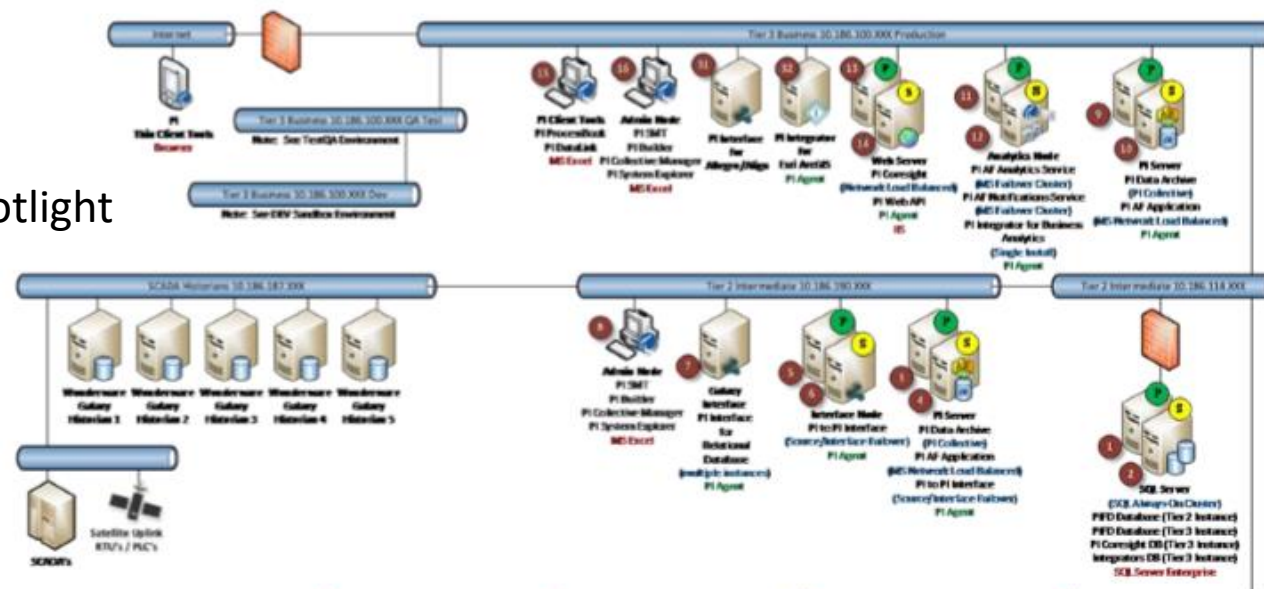
Use case presented at OSIsoft PI World

ROVISYS
Automation & Information Solutions

AVEVA

Enterprise Data Platform

AVEVA PI System Infrastructure:

- 4 PI Data Archives +580,000 tags
- +100 Interface Instances
- PI AF +8,200 elements
- AVEVA PI Vision:
  - Plant Overview/KPI Screens
  - Compression Health Monitoring Screens
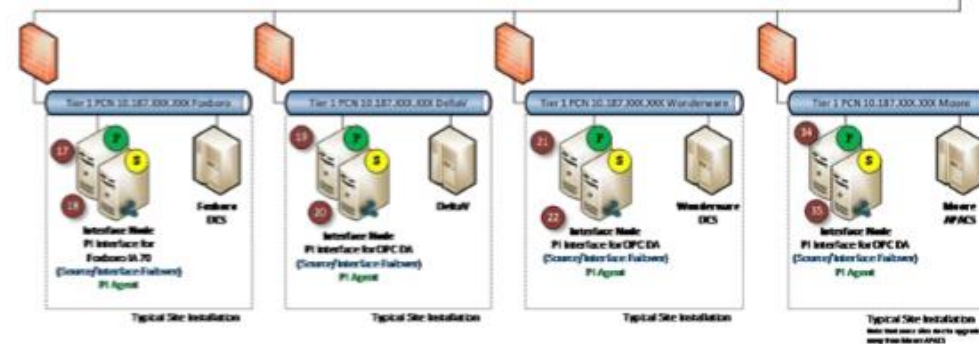 - System Overview/KPI Screens

Templates:

- +325 PI AF Templates
- +55 Event Frames
- +90 Notifications
- +900 Analytic Templates
  - +103,000 analyses running

System Integration:

- SCADA
- WinFlow
- Maximo
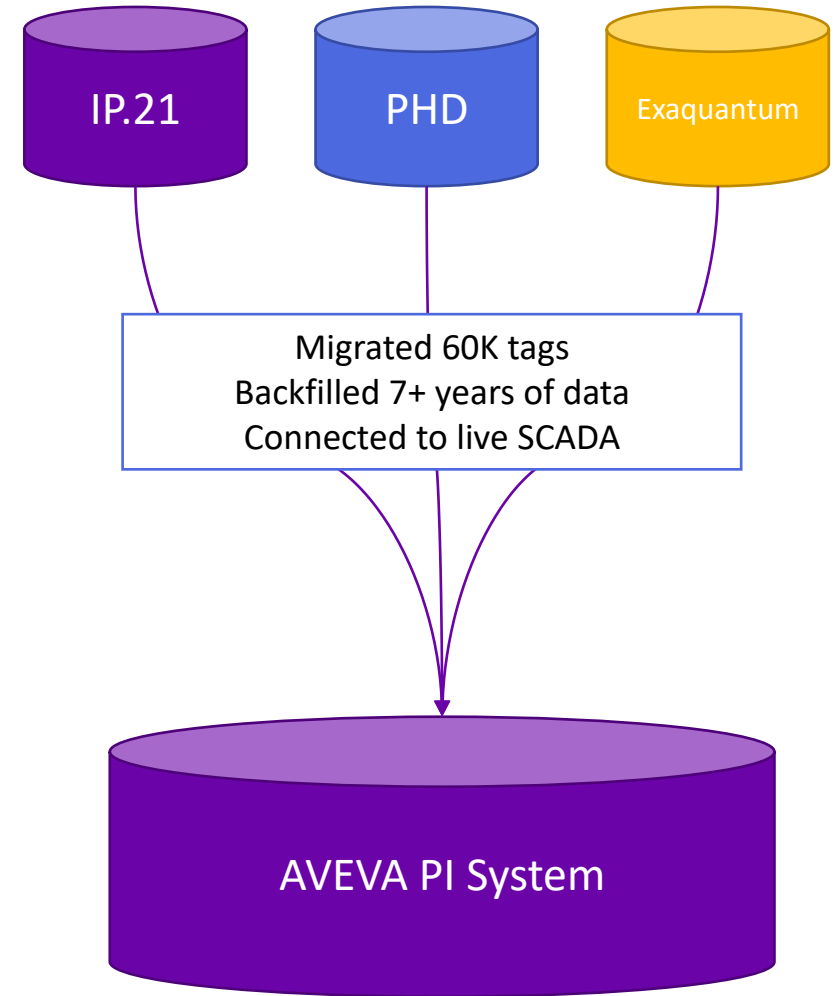- Azure & PI Cloud Connect

WindRock Spotlight

Fuel Oil Refining Optimization

- Challenge

    - Oil refinery wants to optimize their on-spec diesel production

    - Difficulty balancing out unit draws to maintain an on-spec blend

- Solution

    - Data Driven Model (DDM) trained on years of high quality/high frequency historical data

    - Autonomous AI Brain is trained to determine how much diesel fuel to draw out of the distiller, considering layers of higher and lower density product above and below

    - Delay between action and lab results mitigated by incorporating proxy measures that accurately predict lab results in real-time

    - Web-based application decision support system to advise operators on how much diesel fuel to draw

- Benefits

    - Proper balancing of diesel fuel draws

    - More on-spec diesel fuel production

ROVISYS
Automation & Information Solutions

AVEVA

Historian Migration

- Challenge
  - Major refining company had multiple historians and needed to standardize on one platform
  - Each historian had 7+ years of data, and 20K+ tags

- Solution
  - RoviSys migrated all historical data from AspenTech IP.21, Honeywell PHD, and Yokogawa Exaquantum
  - Created 60K+ tags in AVEVA PI System, backfilled all data, and wired up to SCADA system for live data
  - Built asset hierarchy in PI AF to represent hundreds of refining assets

- Benefits
  - Standardized on a single historian platform across the entire enterprise
  - Created a common OT data infrastructure, organized by asset, for accessing process data anywhere in the organization
  - Eliminated ongoing licensing costs for other historian platforms

IP.21   PHD   Exaquantum

Migrated 60K tags
Backfilled 7+ years of data
Connected to live SCADA

AVEVA PI System

ROVISYS Automation & Information Solutions   **AVEVA**

Food Packaging Company

- Challenge
  - Increase first-pass yield on plastic cups in a sold-out industry
- Solution
  - Implement a comprehensive data historian
  - Connect historian to analytics platform
  - Leveraged OEE to increase transparency
- Benefits
  - Overall gains of $10M incremental revenue annually
  - Shipments per shift increased
  - Adjusted to optimal line speeds, which improved Availability and Quality
  - Equipment downtime reduced

ROVISYS
Automation & Information Solutions

AVEVA

Major Aluminum Wheel Company

- ## Challenge
  - Lots of ideas for improvement, but no way to justify the cost, or anticipate the ROI
  - Needed OEE to show where improvement dollars should be spent

- ## Solution
  - Implement AVEVA PI System with a custom web portal
 - Integrate multiple sources of data into a single pane of glass

- ## Benefits
  - Increased efficiency and effectiveness of continuous improvement efforts
  - Enabled a transition to data-driven culture
  - Reduced scrap rate by 2%
  - 1 Year Actual ROI (2 Year Planned)
  - Millions in ongoing savings

ROVISYS
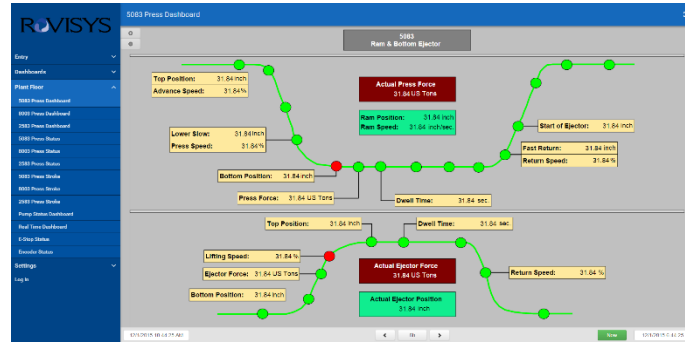Automation & Information Solutions

AVEVA

Major Aluminum Wheel Company

Job is downloaded from ERP system
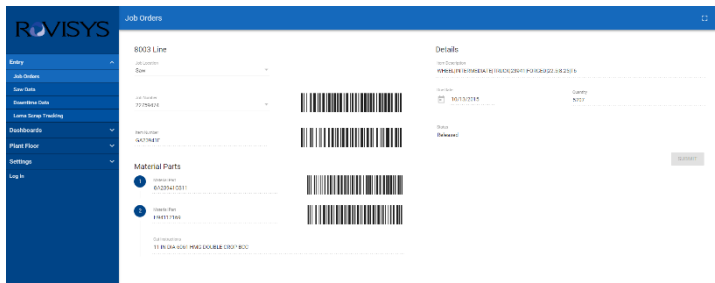
Press is operated, process data is captured
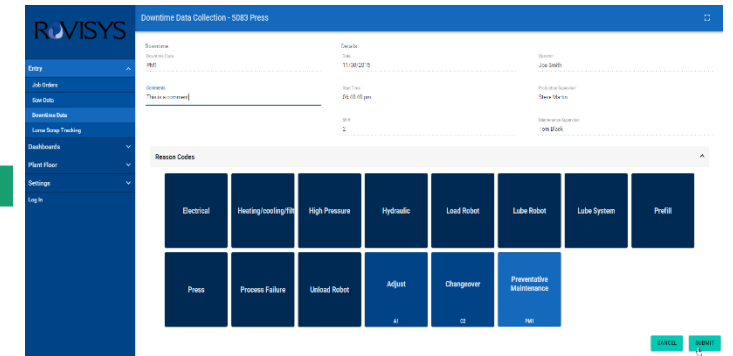
Downtime is automatically identified by the system

Operators classify downtime reasons

Pareto shows most frequent causes of downtime

Dashboard reveals lost production time and OEE metrics

Major Natural Gas Pipeline Company

- Challenge
  - Major asset failures caused two system outages with severe liability consequences

- Solution
  - Implement a data historian with an asset web portal
  - All critical assets are available to view at a site and equipment level, including real-time statistics and predictive analytics
  - Deployed executive dashboards

- Benefits
  - Went from 80% uptime to **99.5%** uptime
  - Reduced annual maintenance costs by $2.3 million
  - When 2019 Polar Vortex hit, no major downtime events occurred
  - Increased customer confidence

Use case presented at OSIsoft PI World

ROVISYS
Automation & Information Solutions

AVEVA

Multinational Methanol Catalyst Company

- **Challenge**
  - Availability of assets significantly affected by downtime
  - Could not connect downtime to asset responsible

- **Solution**
  - Created an AF hierarchy to mirror the SAP PM asset hierarchy
  - Implemented downtime monitoring in AVEVA PI System to capture line downtime
  - Trained operators to associate responsible unit to downtime, as well as choose the correct reason code

- **Benefits**
  - Standardized the process of downtime tracking
  - Eliminated manual data recording
  - Allowed pareto reporting on assets with biggest impact on downtime

ROVISYS
Automation & Information Solutions
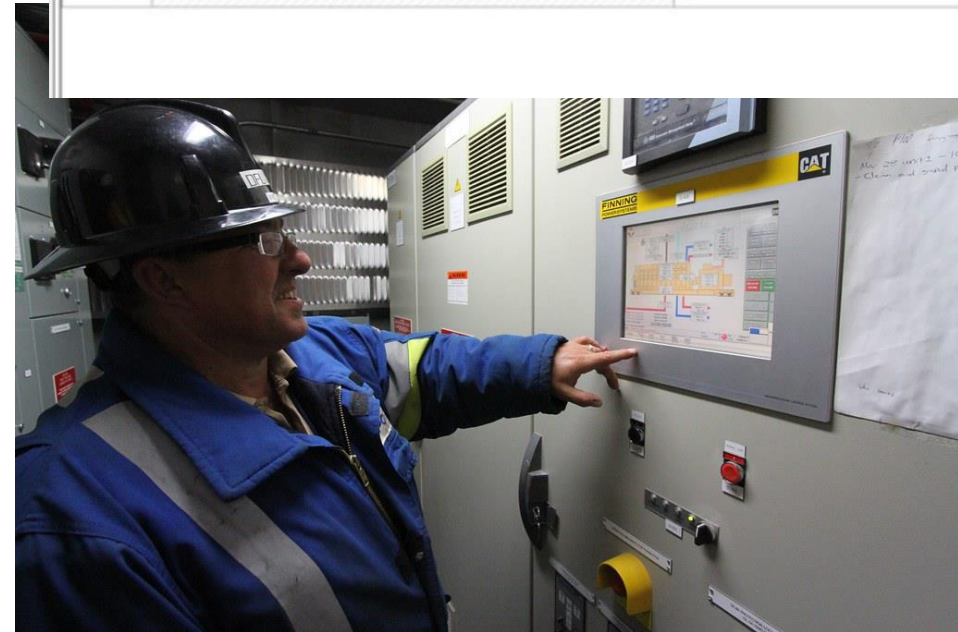
AVEVA

Multinational Methanol Catalyst Company

- Leveraged out of the box AVEVA PI System
  - Used PI System Explorer to prompt operators for detailed information on the downtime
  - Used PI Event Frames for Downtime, and PI Asset Framework (AF) for Asset Hierarchy and Reason Code Tree

- Replaced several manual paper processes
  - Previously, results were inconsistent
  - Downtime was not being associated with responsible asset

- Planned global rollout
  - Currently getting buy-in from other plants to roll this solution out globally

TK Downtime Ex 05/08/2020 08:24:00

General | Child Event Frames | Referenced Elements | Attributes

Filter

Name	Value
00. Downtime Reason Code	0003 - Break down - equipment
01. Equipment	L201, Drying Furnace
02. Component	Cooling Air Blower L201 L201-3
03. Description	Motor Failure
04. Other Description	N/A

R⊙VISYS
Automation & Information Solutions

AVΞVA

Specialty Polymer Company

- ## Challenge
  - Scale out a home-grown OEE and Data Acquisition (DAQ) system
  - Create Power BI visualization incorporating data from OEE/DAQ system, AVEVA PI System, as well as Dynamics AX (ERP) data

- ## Solution
  - Managed the build-out of four PLC panels to scale out the existing OEE/DAQ system
  - Re-implemented the OEE/DAQ system on the Wonderware platform
  - Provided Power BI consulting and implementation services

- ## Benefits
  - Scaled out line visibility to four additional lines
  - Comprehensive Power BI reports, covering line operations as well as raw material costs

ROVISYS
Automation & Information Solutions

AVEVA

This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

ROVISYS
Automation & Information Solutions

AVEVA

linkedin.com/company/aveva

@avevagroup

ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

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.

Learn more at www.aveva.com

AVEVA