NOVEMBER 2022

Visualizing the Digital Twin, an independent service on the industrial cloud platform

Steve Parvin, AVEVA and Lori Warda, AVEVA

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Introduction – the Business Challenge

Building a Solid Engineering Data Set

Integrating Engineering Data in AVEVA Insight

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The business challenge

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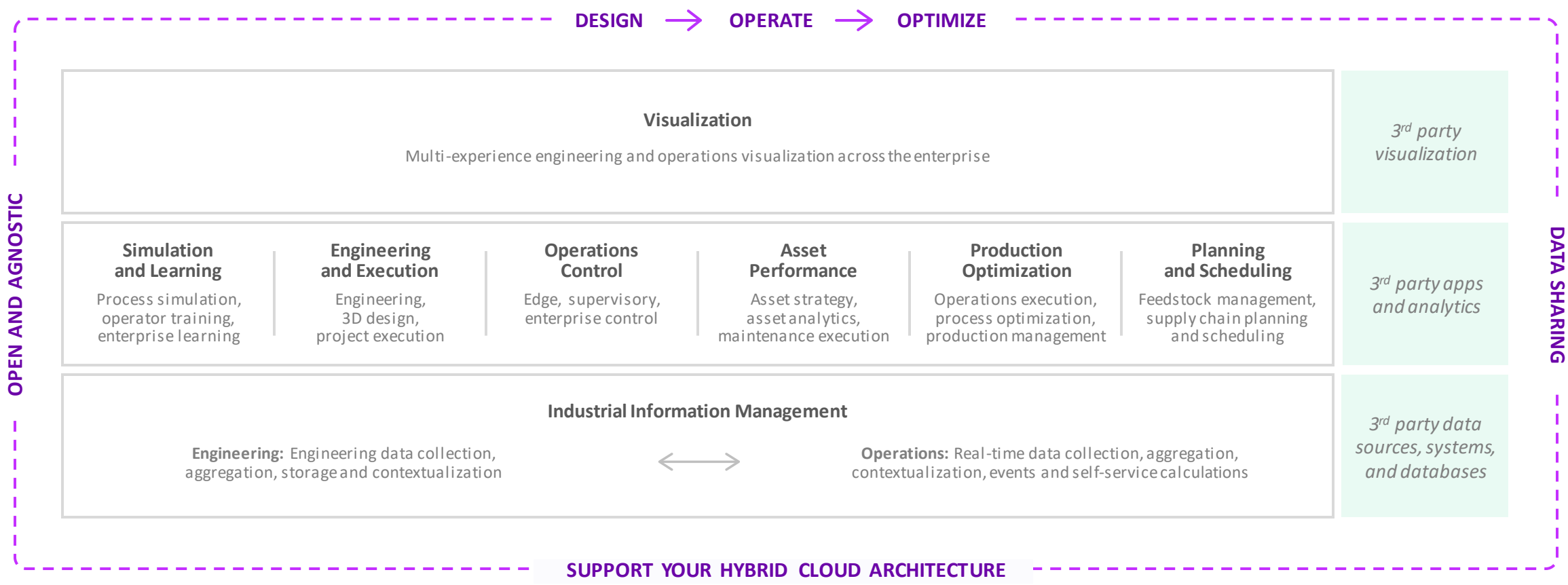
Delivering a complete digital thread, purpose-built for industry

Accelerate time to value with flexible, scalable, and trusted industrial hybrid SaaS solutions



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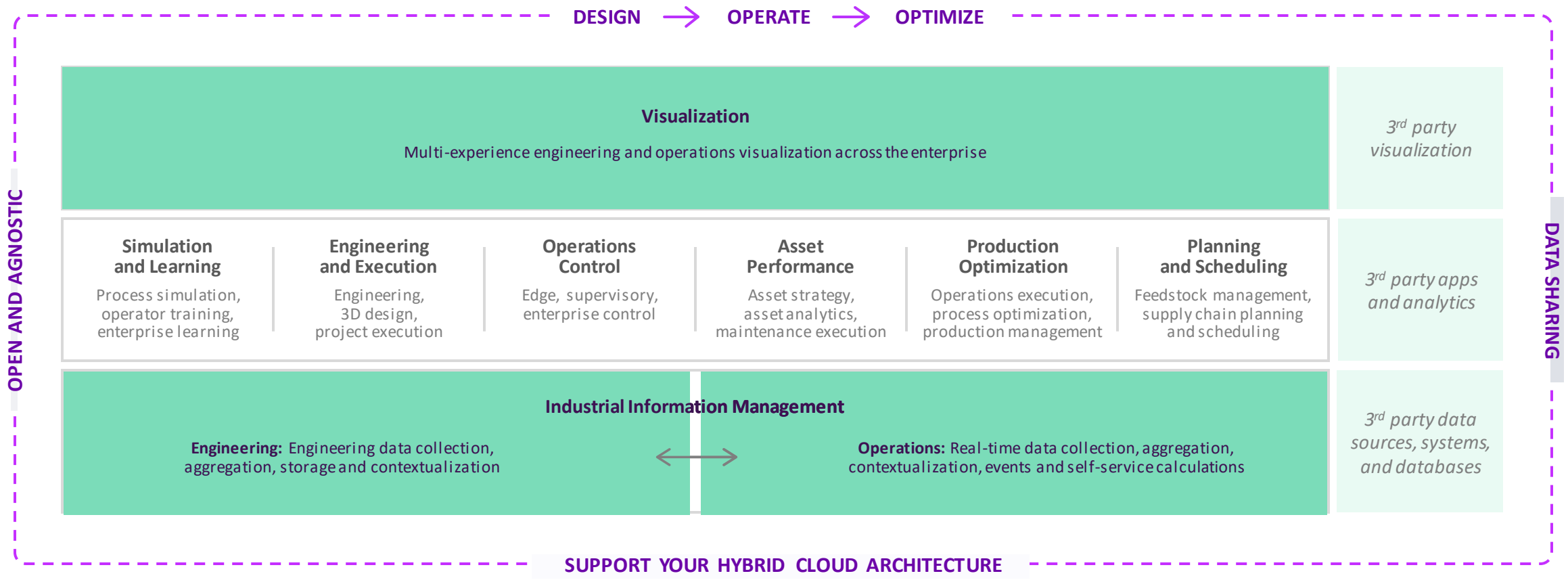
Industrial information management

The foundation of the digital twin



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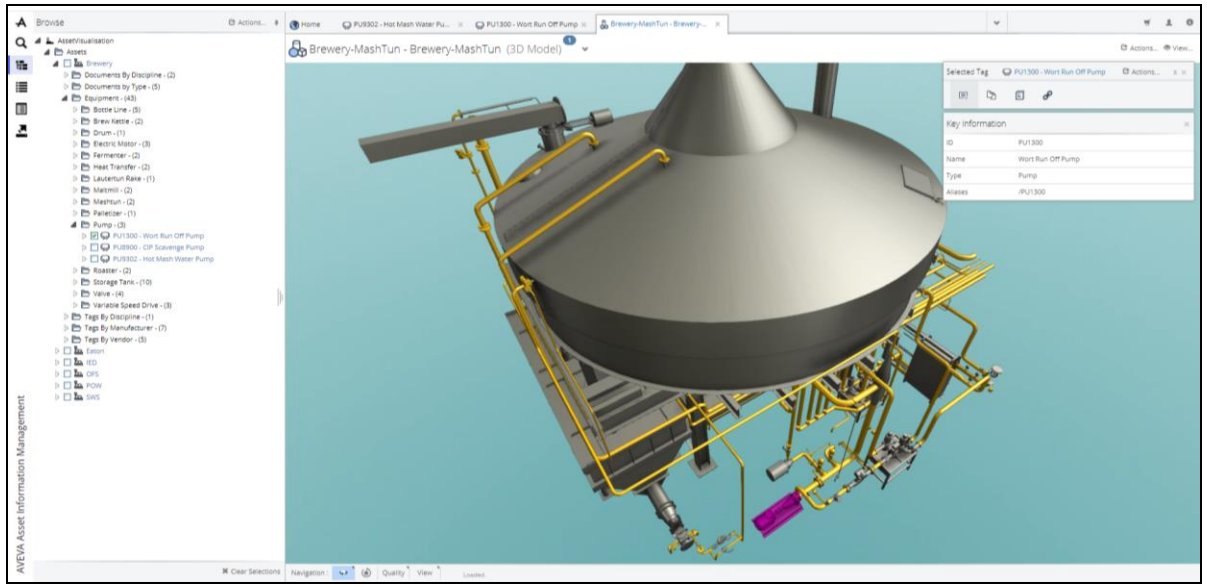
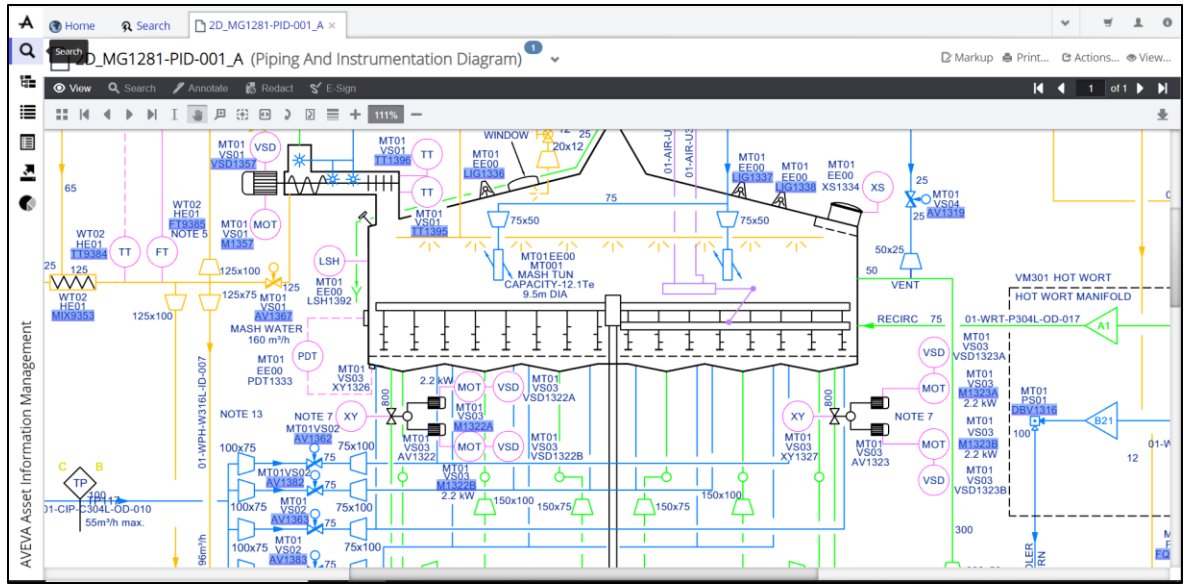
AVEVA Asset Information Management Advantages





Eliminate data silos with all information available in one place

Improve safety and compliance with quick access to critical information

Gain the insights necessary for informed, good decision making

Save time and effort on finding and validating information

Empower teams to collaborate with a 360° view of data

Reduce costs and time to value with a cloud solution

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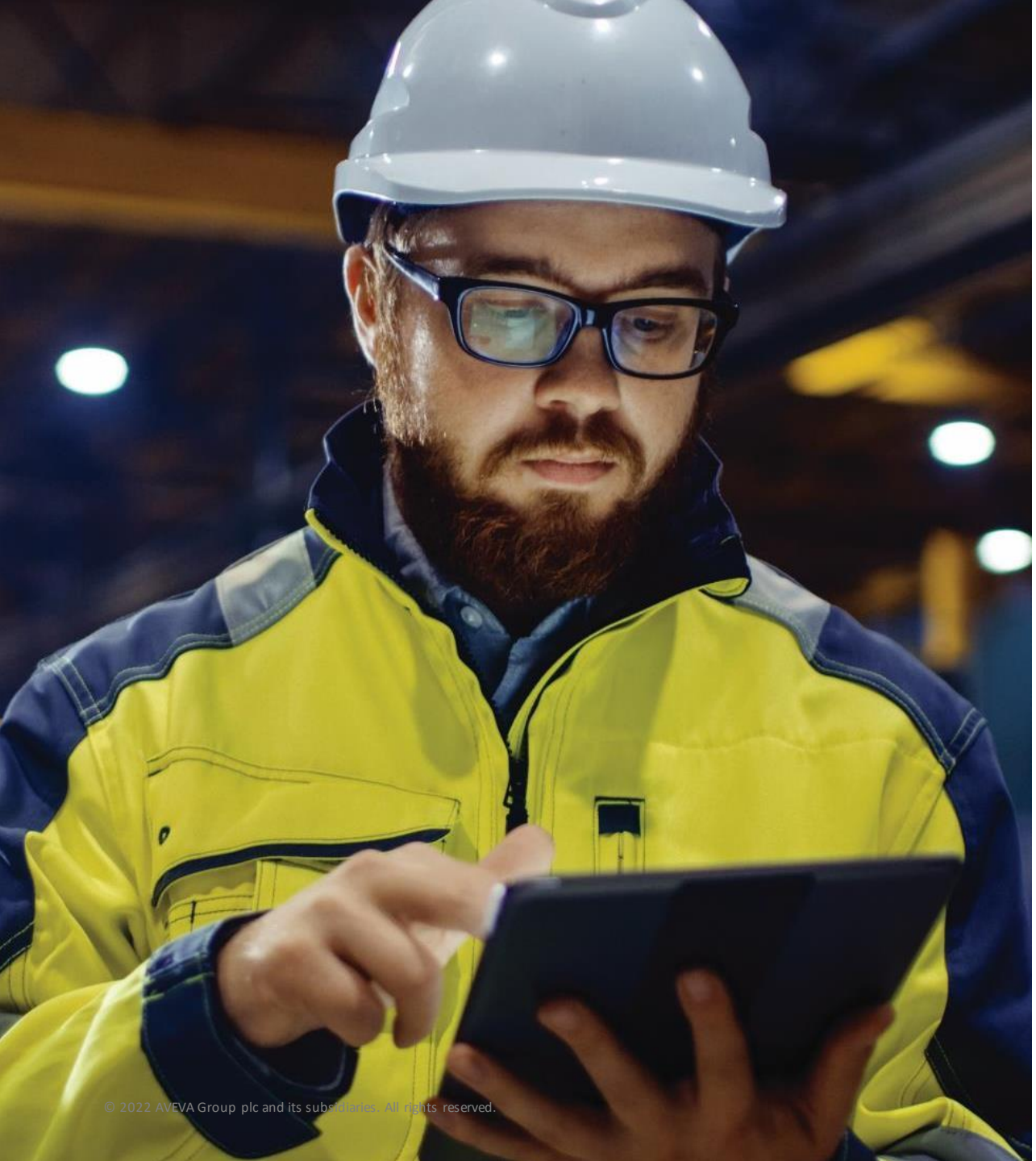

Trusted information matters

Accurate decision making relies on being able to find the correct information, at the right time

- Businesses with poor asset information management processes are found have total business expenditures up to 5% higher.

  Ref. IAM Institute

  Asset Information, Strategy, Standards and Data Management SCG, 2018

- “Only 2/3 of required asset information is in the EAM system.”

  ARC Advisory Group survey 2010/SAP-Centric EAM 2011

- “The cost of poor asset information equates to 1.5% of sales revenue p.a.”

  Ref. NIST Study / SAP-Centric EAM 2011

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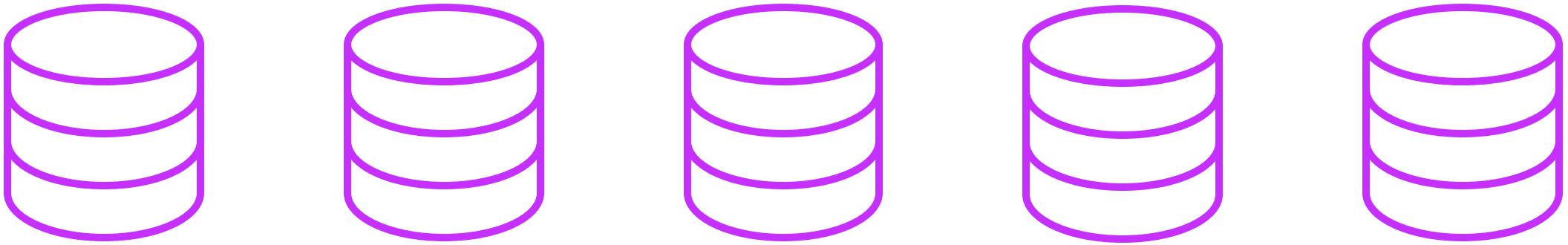
Data silos

Disconnected information in multiple systems and formats

- Different user experiences/training
- Time to find and aggregate
- Alignment/trust



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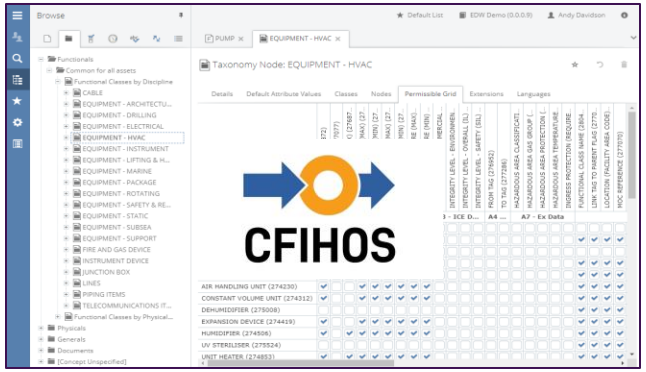
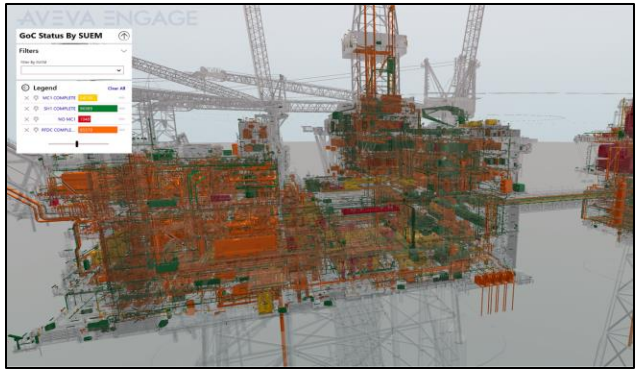
Capabilities during CAPEX

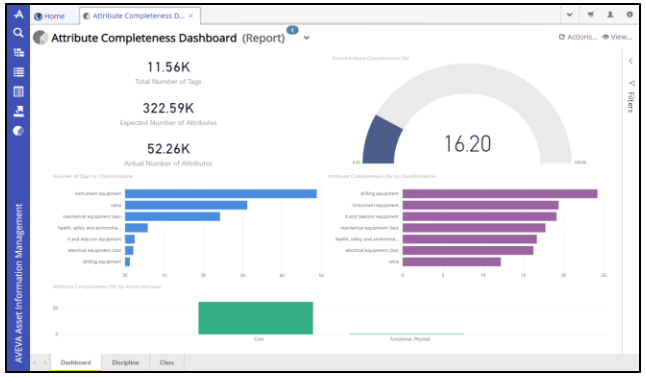
Improve visibility, trust and control to meet budget and schedule while enabling a smooth handover and a quick start-up



Information standard aligned with international standards to guide adoption of a consistent approach to information.



Collaborative, graphical reviews of constructability and commissioning status



Accurately measure data quality Verify consistency, compliance and completeness of data from EPC.

Use the 3D model for conducting e-reviews and apply mark-up remotely.

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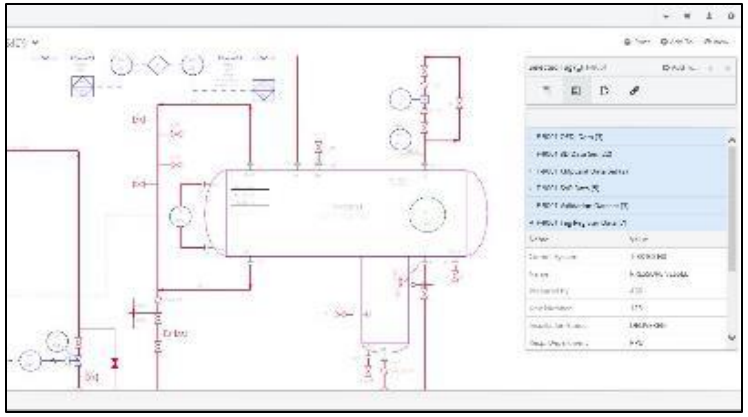
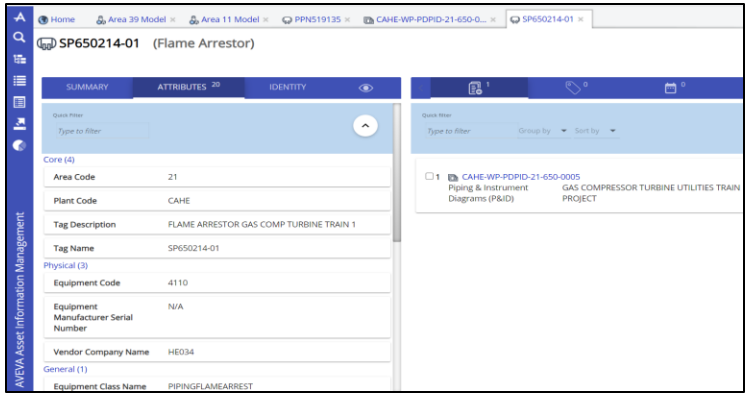
Capabilities during OPEX

Use of as-operated engineering data to support analysis for performance, safety, process issues…

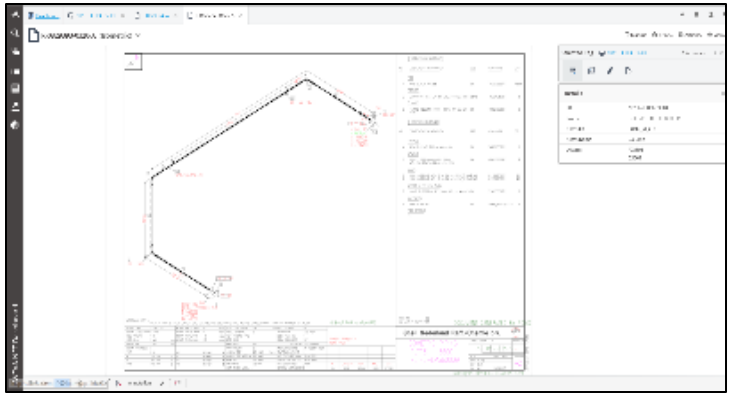


Intelligent, Hotspotted 2D Diagram (PEFS, Instruments & Electrical drawings

Interactive Streamed 3D Model



Functional Location Summary Page



Intelligent, Hotspotted Isometric, Corrosion Loop Iso etc

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Contextualize your data with AVEVA™ Asset Information Management

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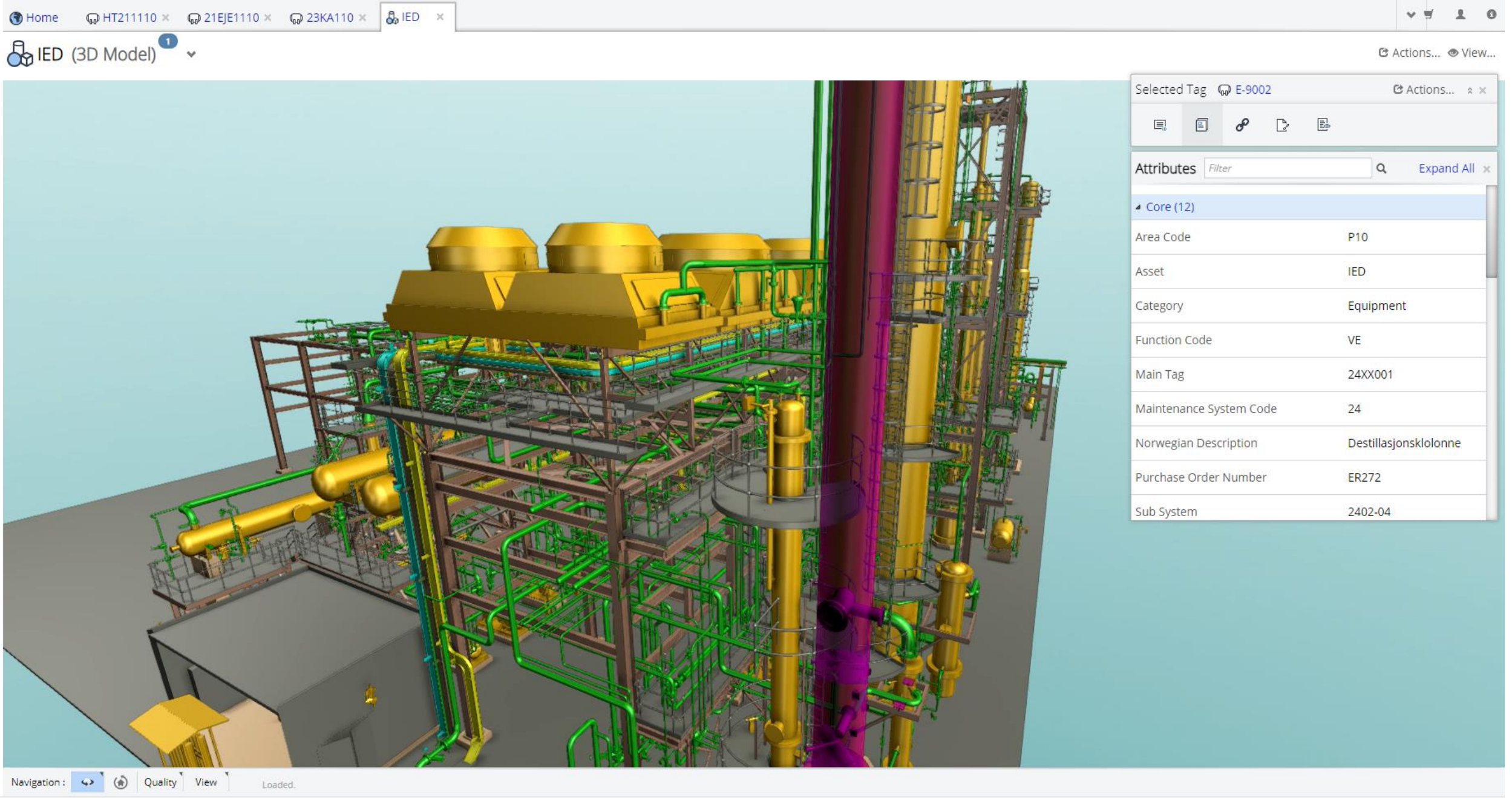

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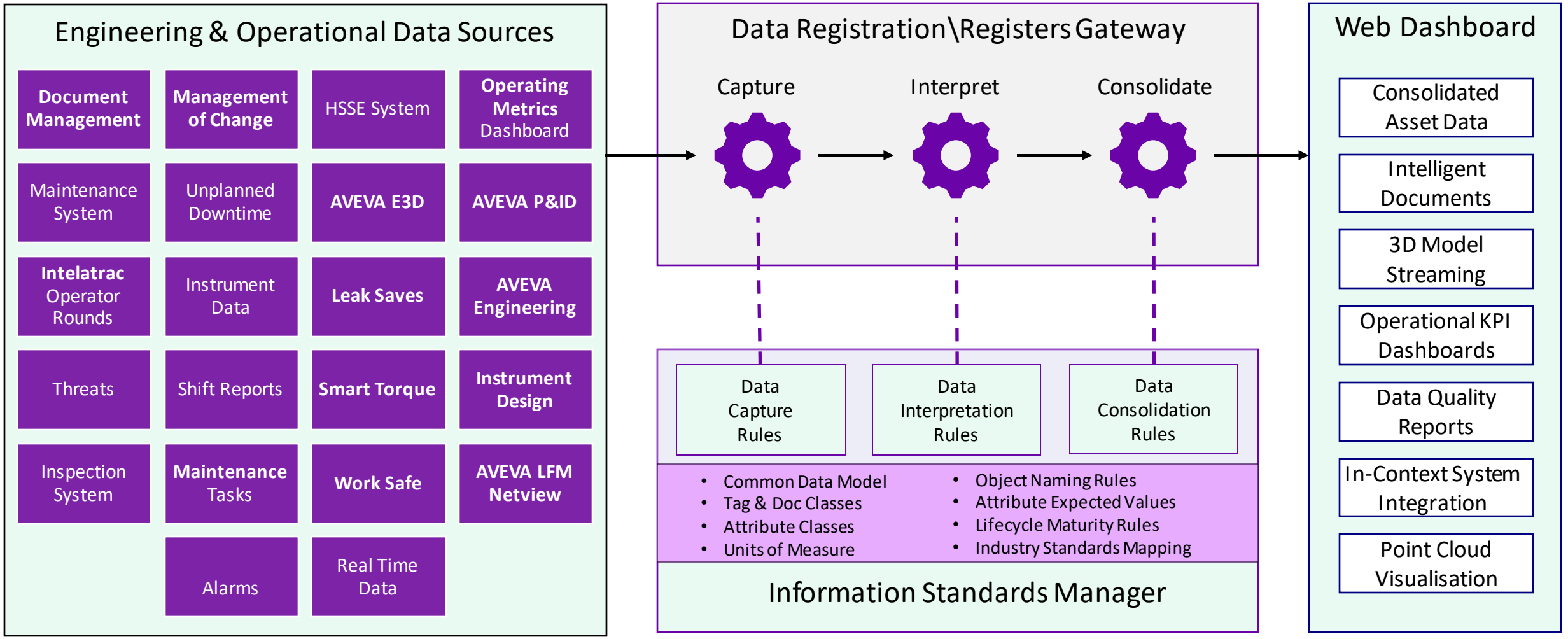
Complex data mapping



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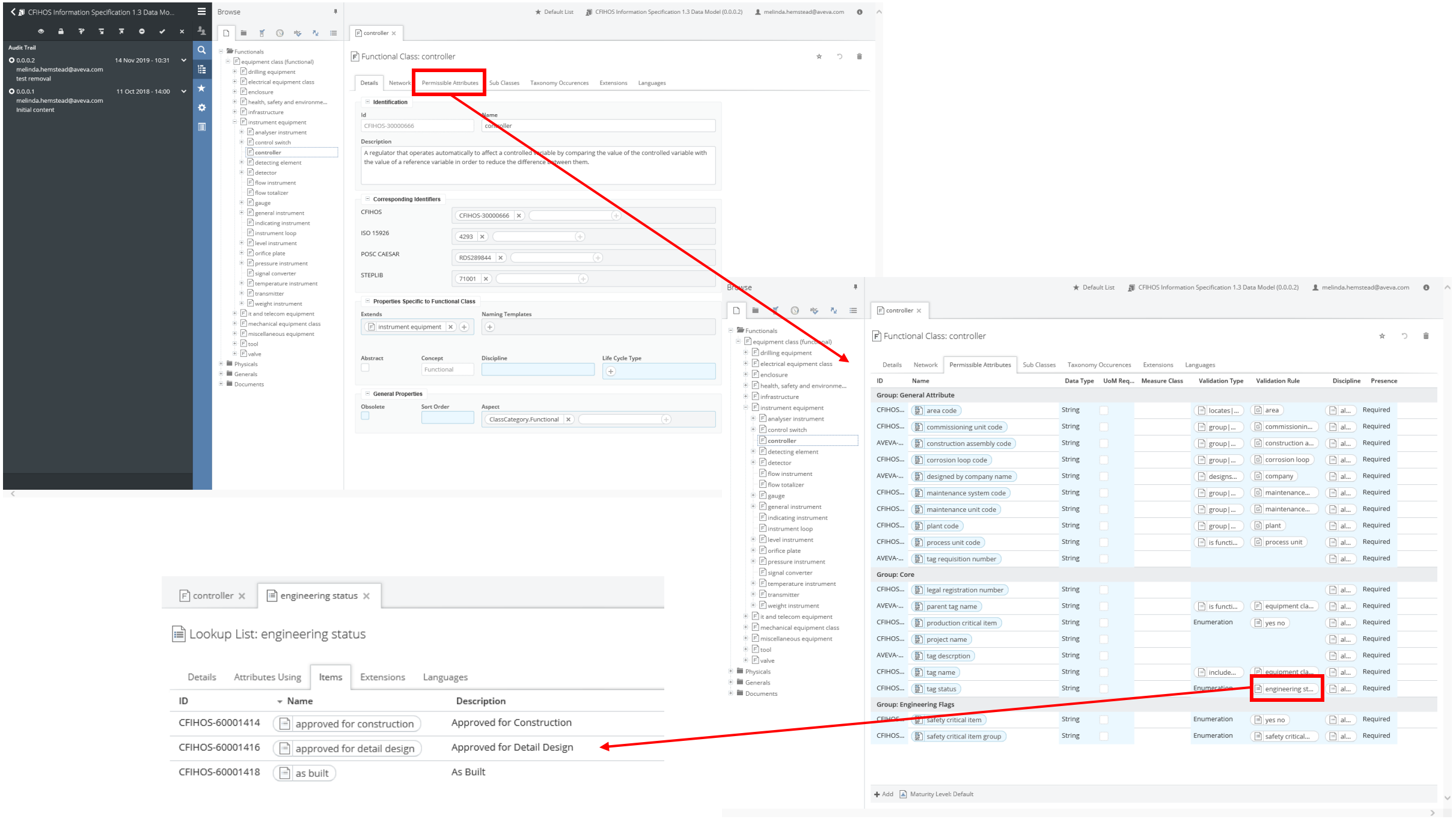
Class Name (235)	Class Id	#Attribut	Approved By	Approved By	Associated Line No	Associated Plant Item	BCD Drawing No	Build Sequence No	Building Zone	Building/Facility Asset Code	Cable Route	Cable Route Category	Cable Type	Check Level	Checked By	Comments	Construction Zone	Contamination Classification	Core Area	Cut Length	Datasheet No	Date Modified	Depth	Description	Description	Design Length	Design Level	Design Pressure	Design Temperature	Discipline Responsibility	Document Reference	Door Number	Drawn By	Duct Spec	EFD Drawing No	Elevation	Engineer'S Order Number	Estimated Length	Exrating	Fire Rating	Floor Level	Fluid Code	Fluid Description	Fluid Phase	From	From Description
Attribute Group →																																												
Attribute Name (121) →			Approved By	Approved By	Associated Line No	Associated Plant Item	BCD Drawing No	Build Sequence No	Building Zone	Building/Facility Asset Code	Cable Route	Cable Route Category	Cable Type	Check Level	Checked By	Comments	Construction Zone	Contamination Classification	Core Area	Cut Length	Datasheet No	Date Modified	Depth	Description	Description	Design Length	Design Level	Design Pressure	Design Temperature	Discipline Responsibility	Document Reference	Door Number	Drawn By	Duct Spec	EFD Drawing No	Elevation	Engineer'S Order Number	Estimated Length	Exrating	Fire Rating	Floor Level	Fluid Code	Fluid Description	Fluid Phase	From	From Description
#Classes →			1	1	7	121	5	1	12	7	5	4	5	1	1	2	22	9	5	1	176	1	31	1	225	5	1	1	1	235	175	1	1	3	176	1	1	5	169	4	7	1	1	1	6	5
AUDIBLE ALARM	AA	22				O															R				R					O	R				R				R							
RADIATION SENSING ELEMENT	abE	22				O															R				R					O	R				R				R							
RADIATION SENSING TRANSMITTER	abT	22				O															R				R					O	R				R				R							
ASPIRATING SMOKE DETECTION	AD	22				O															R				R					O	R				R				R							
AGITATOR	AGITATOR	16																					R		R					O															
AGT DEVICE	AGT	22				O															R				R					O	R				R				R							
SMOKE DETECTION	AIC	22				O															R				R					O	R				R				R							
RADIO ANTENNA	ANT	22				O															R				R					O	R				R				R							
AUDIBLE SOUNDER	AS	22				O															R				R					O	R				R				R							
ACTUATED VALVE	AV	21			R												R				R				R					O	R				R											
BLOWER	BLOWER	16																					R		R					O															
BEACON SOUNDER	BS	22				O															R				R					O	R				R				R							
COLUMN	C	16																					R		R					O															
CLUTCH ACTUATOR	C_CLU	22				O															R				R					O	R				R				R							
CABLE	CABLE	23					R				R		R					R							R	R				O							R						R	R	
CABLE CONTAINMENT	CABLE CONTAINMENT	12							R			R					R							R					O															
CABLE CONTAINMENT COMPONENTS	CABLE CONTAINMENT COMPONENTS	12							R			R					R							R					O															
CABLING	CABLING	1																												O															
CONTROL CABLE	CC	23					R				R		R					R							R	R				O							R						R	R	
RADIATION SENSING ELEMENT	cE	22				O															R				R					O	R				R				R							
CEI	CEI	1																												O															
CEILING	CEILING	12							R	R							R	R												O										R	R				
CIVILS / STRUCTURAL	CIVILS / STRUCTURAL	1																												O															
COMPRESSOR	COMPRESSOR	16																					R		R					O															
RADIATION MONITOR	cSZ	22				O															R				R					O	R				R				R							
RADIATION SIGNAL CONDITIONER / TRIP	cY	22				O															R				R					O	R				R				R							
HEATER / DRYER	D	16																					R		R					O															
DOOR CONTACT	DC	22				O															R				R					O	R				R				R							
DISPLAY EQUIPMENT	DISPLAY EQUIPMENT	16																					R		R					O															
DOOR FURNITURE	DL	22				O															R				R					O	R				R				R							
DOOR	DOOR	14							R	R						R	R								R					O		R									R	R				


CFIHOS Information Specification 1.3 Data Mo...
Audit Trail
0.0.0.2
14 Nov 2019 - 10:31
melinda.hemstead@aveva.com
test removal
0.0.0.1
11 Oct 2018 - 14:00
melinda.hemstead@aveva.com
Initial content
Browse
Default List
CFIHOS Information Specification 1.3 Data Model (0.0.0.2)
melinda.hemstead@aveva.com
controller
Functional Class: controller
Details
Network
Permissible Attributes
Sub Classes
Taxonomy Occurences
Extensions
Languages
Identification
Id
CFIHOS-30000666
Name
controller
Description
A regulator that operates automatically to affect a controlled variable by comparing the value of the controlled variable with the value of a reference variable in order to reduce the difference between them.
Corresponding Identifiers
CFIHOS
CFIHOS-30000666
ISO 15926
4293
POSC CAESAR
RDS289844
STEPLIB
71001
Properties Specific to Functional Class
Extends
instrument equipment
Naming Templates
Abstract
Concept
Functional
Discipline
Life Cycle Type
General Properties
Obsolete
Sort Order
Aspect
ClassCategory.Functional
Functionals
equipment class (functional)
drilling equipment
electrical equipment class
enclosure
health, safety and environme...
infrastructure
instrument equipment
analyser instrument
control switch
controller
detecting element
detector
flow instrument
flow totalizer
gauge
general instrument
indicating instrument
instrument loop
level instrument
orifice plate
pressure instrument
signal converter
temperature instrument
transmitter
weight instrument
it and telecom equipment
mechanical equipment class
miscellaneous equipment
tool
valve
Physicals
Generals
Documents
Functional Class: controller
Details
Network
Permissible Attributes
Sub Classes
Taxonomy Occurences
Extensions
Languages
ID
Name
Data Type
UoM Req...
Measure Class
Validation Type
Validation Rule
Discipline
Presence
Group: General Attribute
CFIHOS...
area code
String
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area
al...
Required
CFIHOS...
commissioning unit code
String
group|...
commissionin...
al...
Required
AVEVA-...
construction assembly code
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group|...
construction a...
al...
Required
CFIHOS...
corrosion loop code
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group|...
corrosion loop
al...
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AVEVA-...
designed by company name
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company
al...
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maintenance system code
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group|...
maintenance...
al...
Required
CFIHOS...
maintenance unit code
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group|...
maintenance...
al...
Required
CFIHOS...
plant code
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group|...
plant
al...
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CFIHOS...
process unit code
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process unit
al...
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AVEVA-...
tag requisition number
String
al...
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Group: Core
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legal registration number
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al...
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AVEVA-...
parent tag name
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is functi...
equipment cla...
al...
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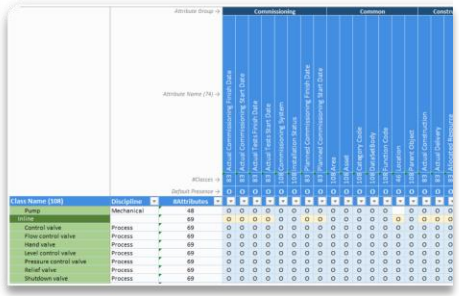
CFIHOS...
production critical item
String
Enumeration
yes no
al...
Required
CFIHOS...
project name
String
al...
Required
AVEVA-...
tag descrption
String
al...
Required
CFIHOS...
tag name
String
include...
equipment cla...
al...
Required
CFIHOS...
tag status
String
Enumeration
engineering st...
al...
Required
Group: Engineering Flags
safety critical item
String
Enumeration
yes no
al...
Required
CFIHOS...
safety critical item group
String
Enumeration
safety critical...
al...
Required
Add
Maturity Level: Default
controller
engineering status
Lookup List: engineering status
Details
Attributes Using
Items
Extensions
Languages
ID
Name
Description
CFIHOS-60001414
approved for construction
Approved for Construction
CFIHOS-60001416
approved for detail design
Approved for Detail Design
CFIHOS-60001418
as built
As Built

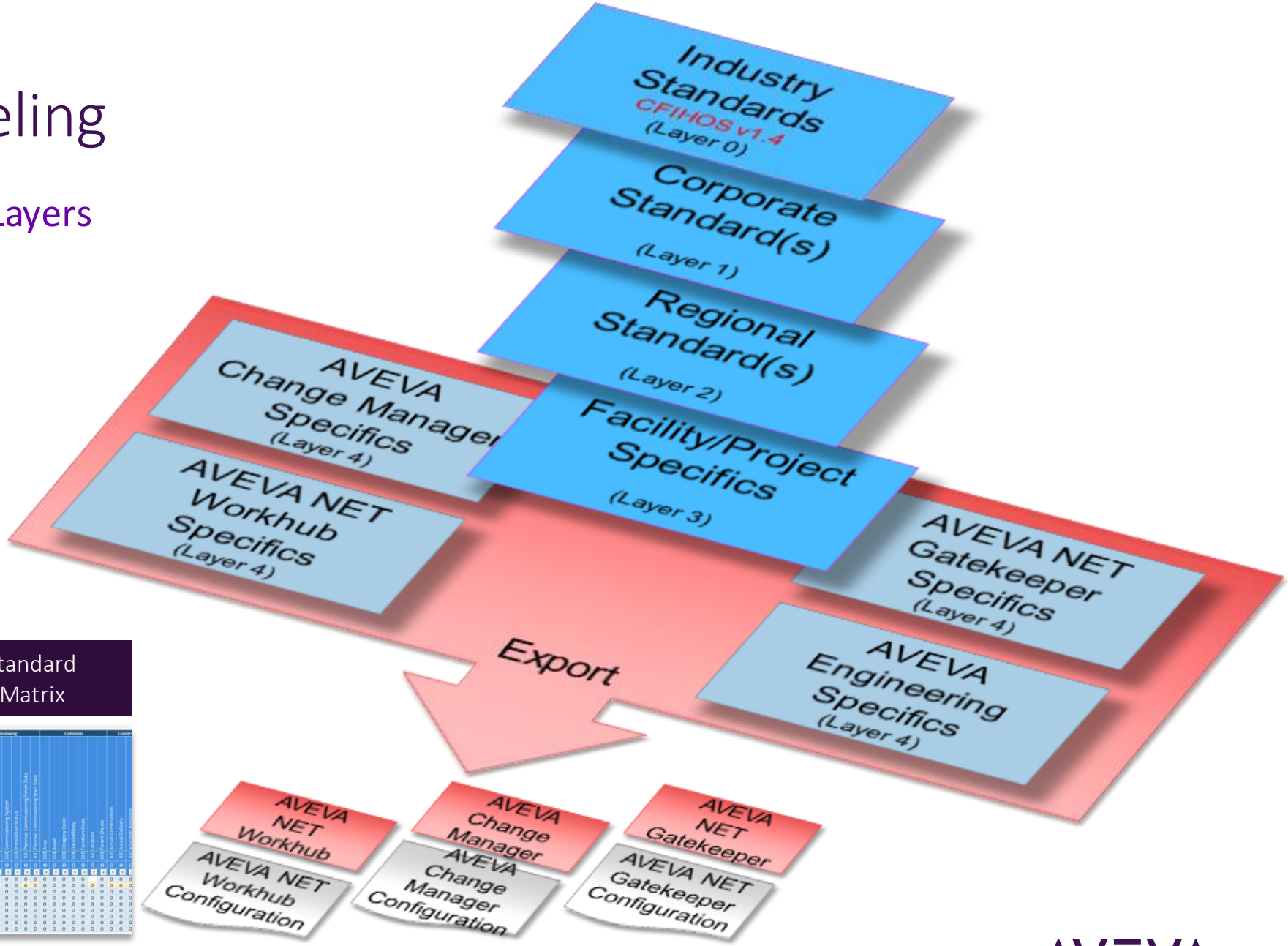
Information Modeling

AVEVA ISM Composition of Layers

Information Handover Specification

Information Standard Deliverables Matrix





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Bringing the digital twin to life using AVEVA™ Insight

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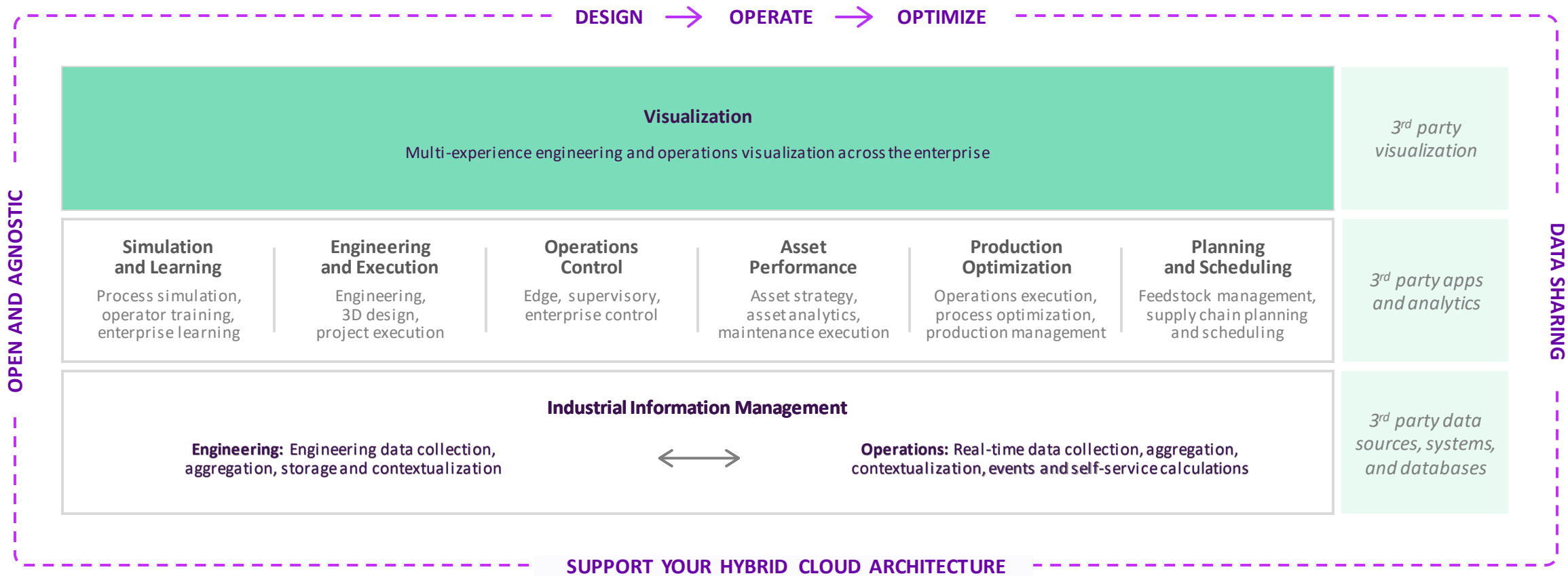
Visualization is the final step

Experience the digital twin in real-time – when, where, and however you like.



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Visualization of Digital Twin

Leveraging the AVEVA Asset Information Management-Advanced Investment by integrating with Process Data and Analytics in the cloud

AVEVA Connect Integration

AVEVA Insight

Operations Data

Engineering Data

AVEVA Federated Information Model

Edge Devices

- 1D, 2D, 3D
- Laser
- Simulated Data

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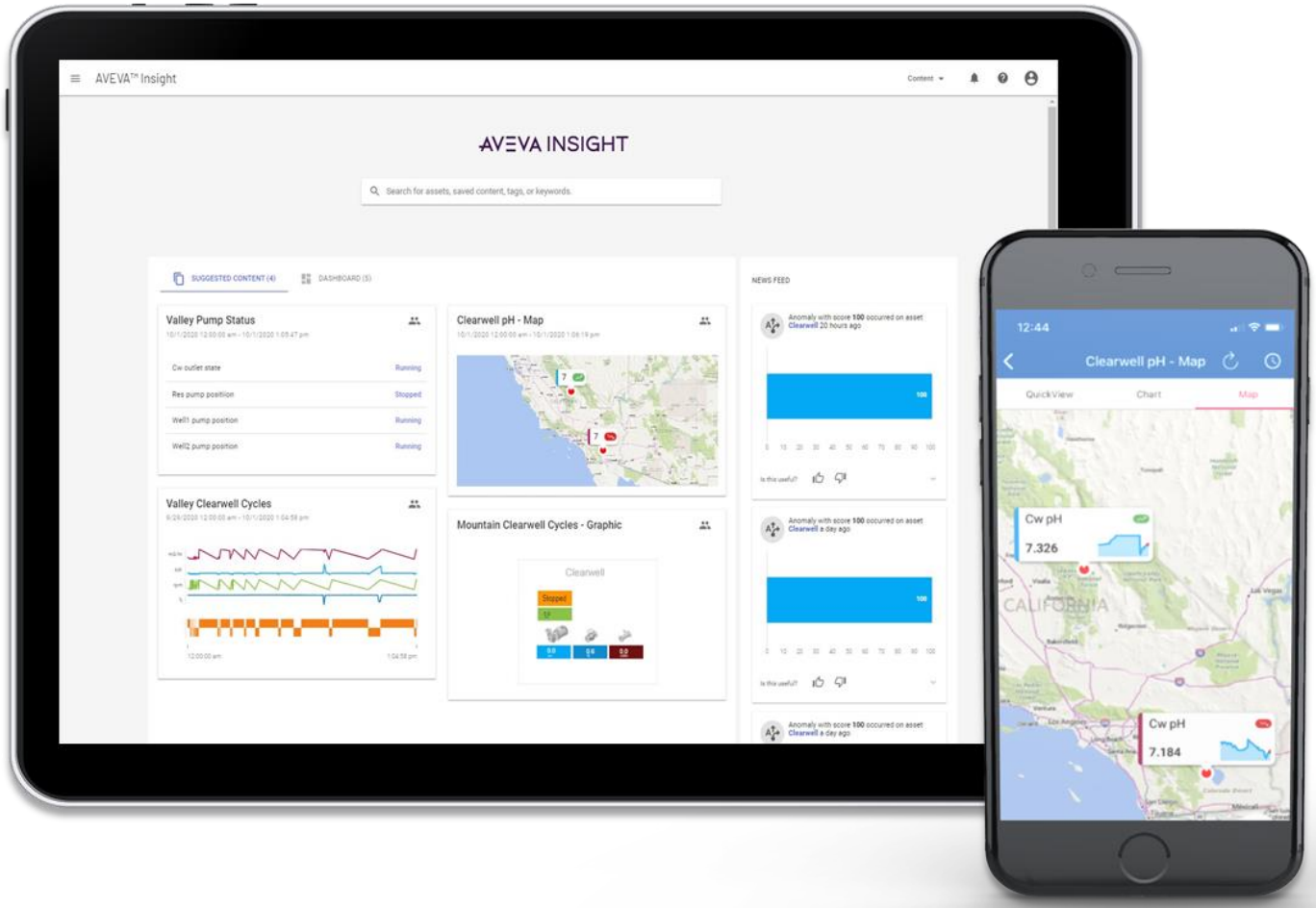
AVEVA

AVEVA Insight

Make better and faster decisions with complete visibility of your operations in the cloud.



AVEVA Insight provides information when and where you need it, so you and your teams, can better manage your assets and improve performance.

- Unlock critical data
- Increase collaboration
- Improve asset reliability
- Drive operational performance

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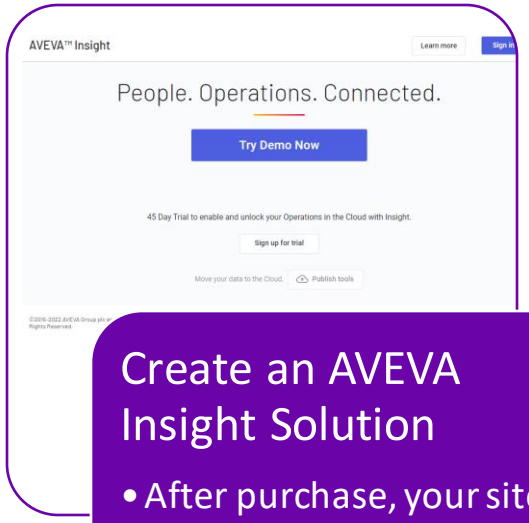
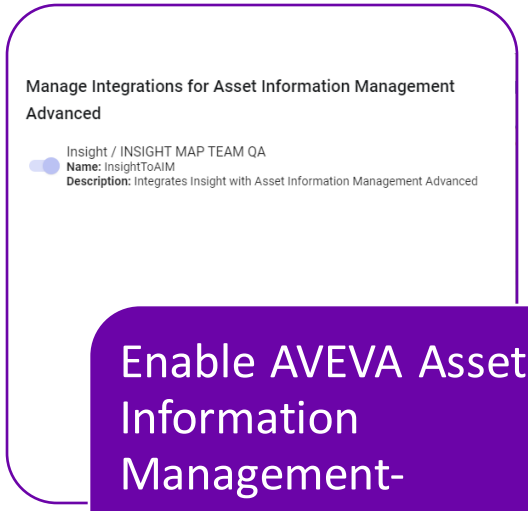
Bringing real-time data into view

How to start with AVEVA Insight as an AVEVA Asset Information Management-Advanced customer



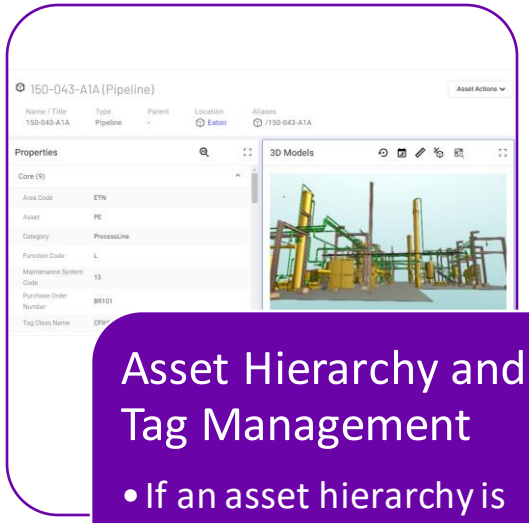
Create an AVEVA Insight Solution

- After purchase, your site will be created
- The solution will be in the same account as AVEVA Asset Information Management-Advanced



Enable AVEVA Asset Information Management-Advanced integration

- Integration is self-service – once the solutions are created, it is as easy as checking a button



Asset Hierarchy and Tag Management

- If an asset hierarchy is already created in Insight, we will show you how to align them

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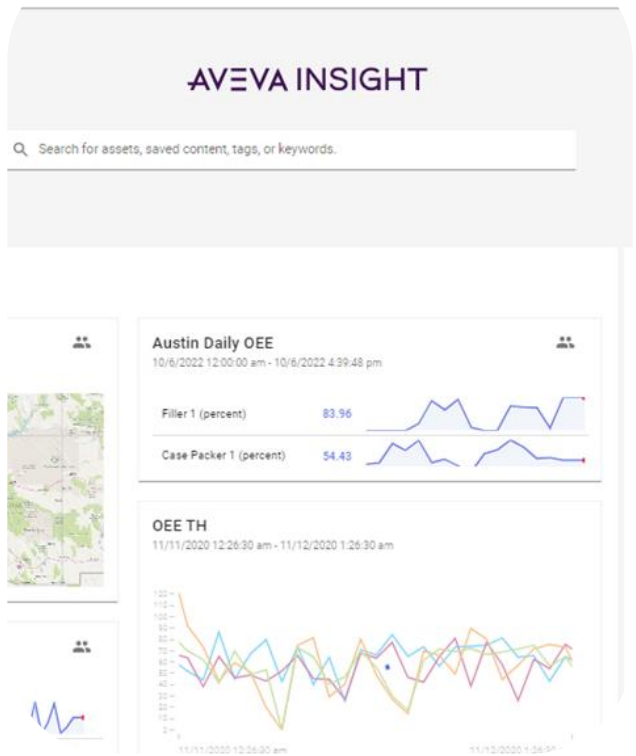
AVEVA Insight Capabilities



- Real Time Data Analysis
- Search Based Navigation
- Automated Analytics (Newsfeed)
- Asset View
- Dashboarding
- Condition Based Rules
- Advanced & Guided Analytics

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AVEVA Insight

portal.qa-insight.capdev-connect.aveva.com/framework/explore

AVEVA™ Insight

- Home
- Alerts
- Alarms
- Assets
- Lists
- Content
- Dashboards
- Collections
- Equipment Efficiency
- OEE Analysis
- Administration
- Recently Viewed

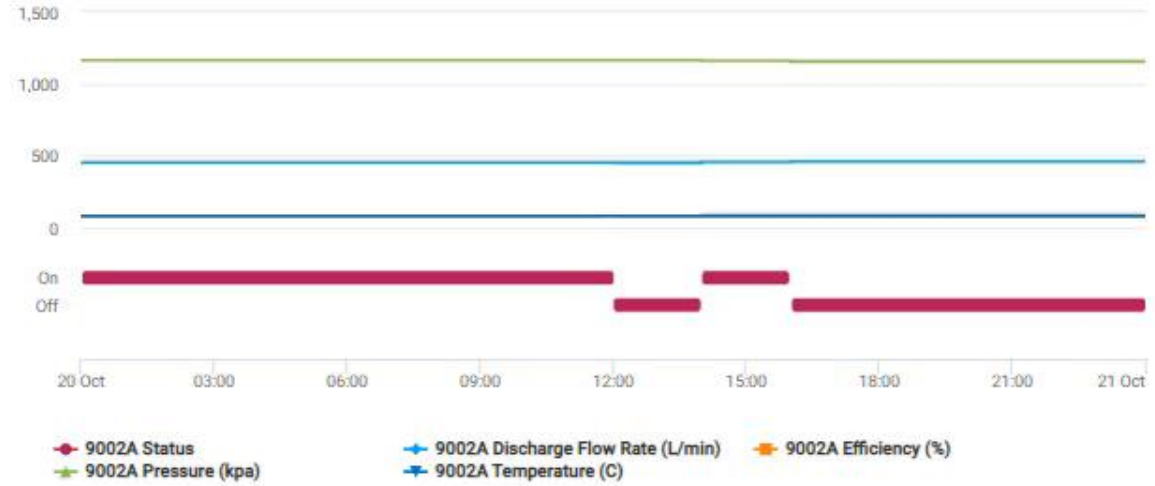
COLLAPSE

AVEVA INSIGHT

Search for assets, data or saved content

Pump 101 Data

10/20/2022 12:00:00 am - 10/21/2022 12:00:00 am

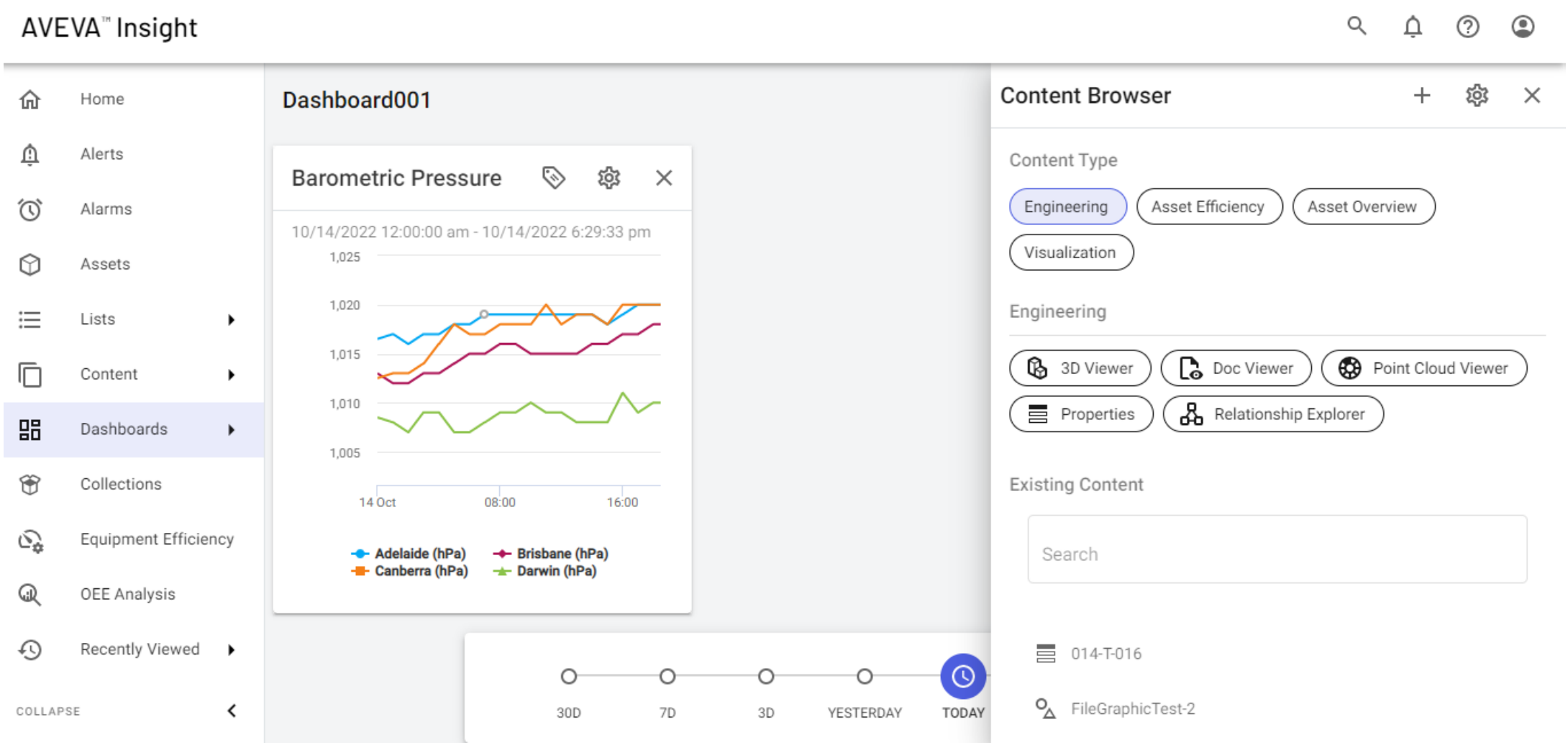


Interesting facts about your data

We spend the first week or two learning about your data. After that, you'll begin seeing news stories here that highlight unusual and interesting events in your data trends.

Point Cloud Pump Item

Creating Dashboards



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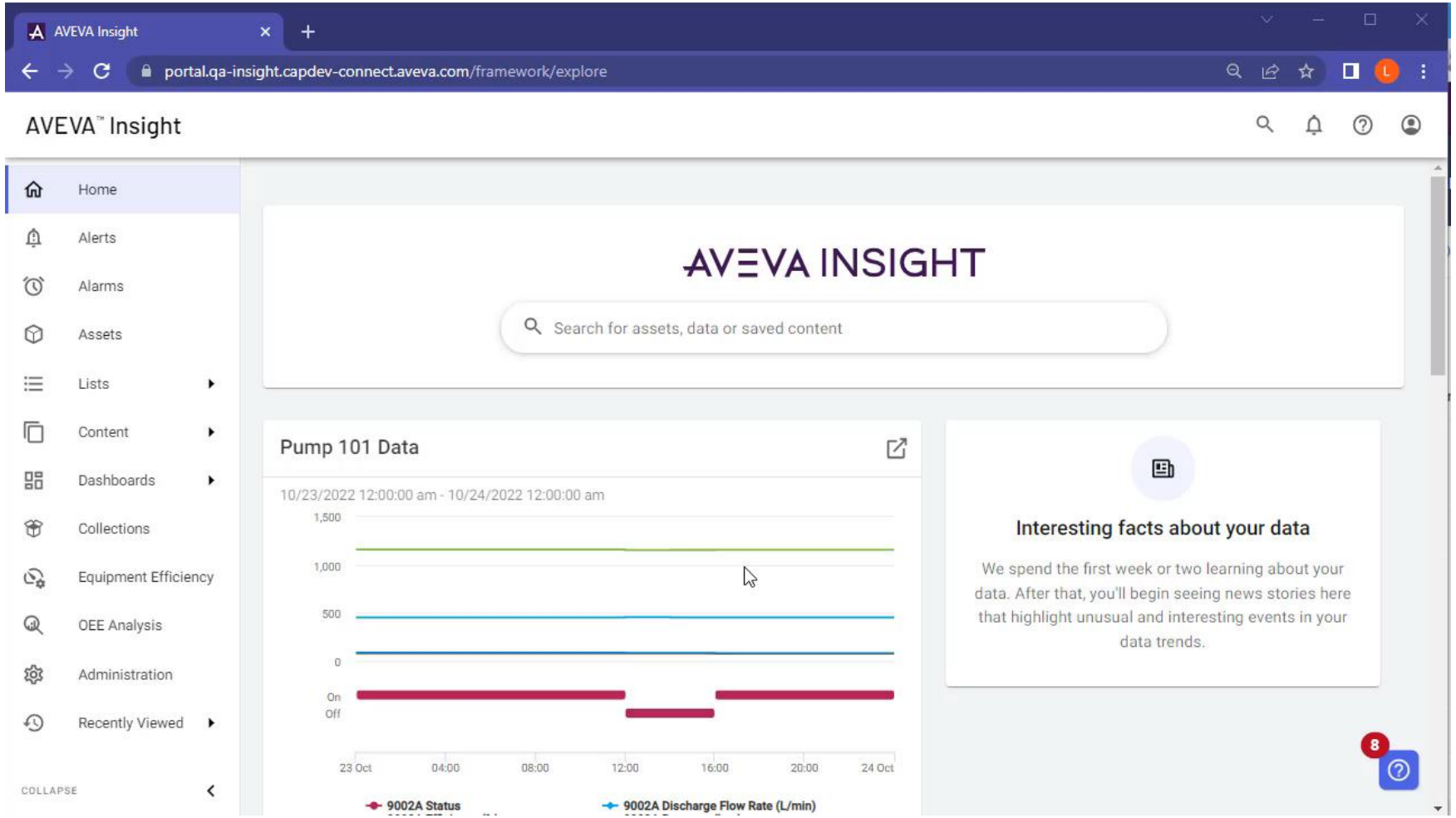
Creating Dashboards Demo



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J-9002A

portal.qa-insight.capdev-connect.aveva.com/framework/engineering/s901%7Cj-9002a

AVEVA™ Insight

- Home
- Alerts
- Alarms
- Assets
- Lists
- Content
- Dashboards
- Collections
- Equipment Efficiency
- OEE Analysis
- Administration
- Recently Viewed

COLLAPSE

J-9002A (Pump)

0 | Asset Actions

Name / Title	Type	Parent	Location	Aliases
J-9002A	Pump	-	IED	/J-9002A

J-9002A

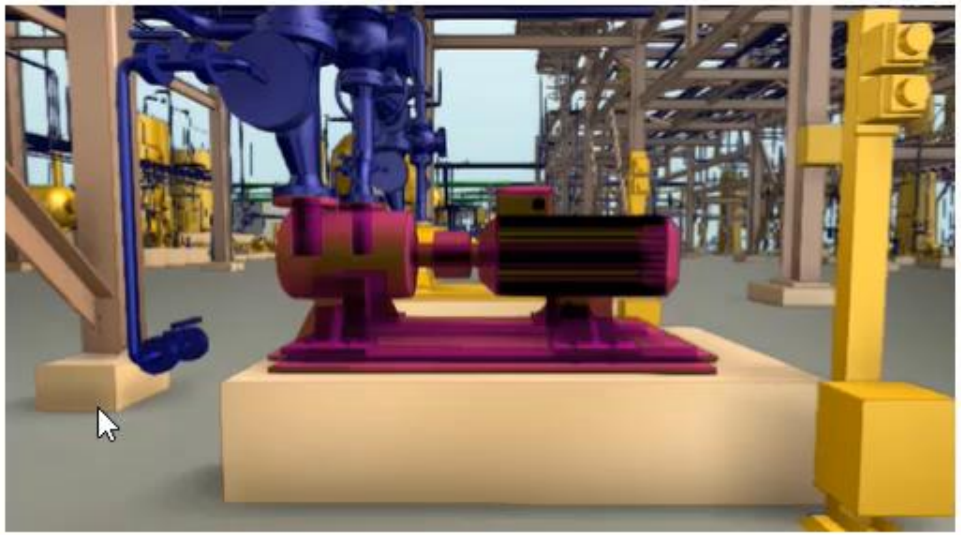
Overview | Summary View | Point Cloud Dashboard

Properties

Core (12)

Area Code	C31
Asset	IED
Category	Equipment
Function Code	PA
Main Tag	43PA002B
Maintenance System Code	43
Previus Ld Tag Number(s)	53PH001A
Purchase Order Number	ER300

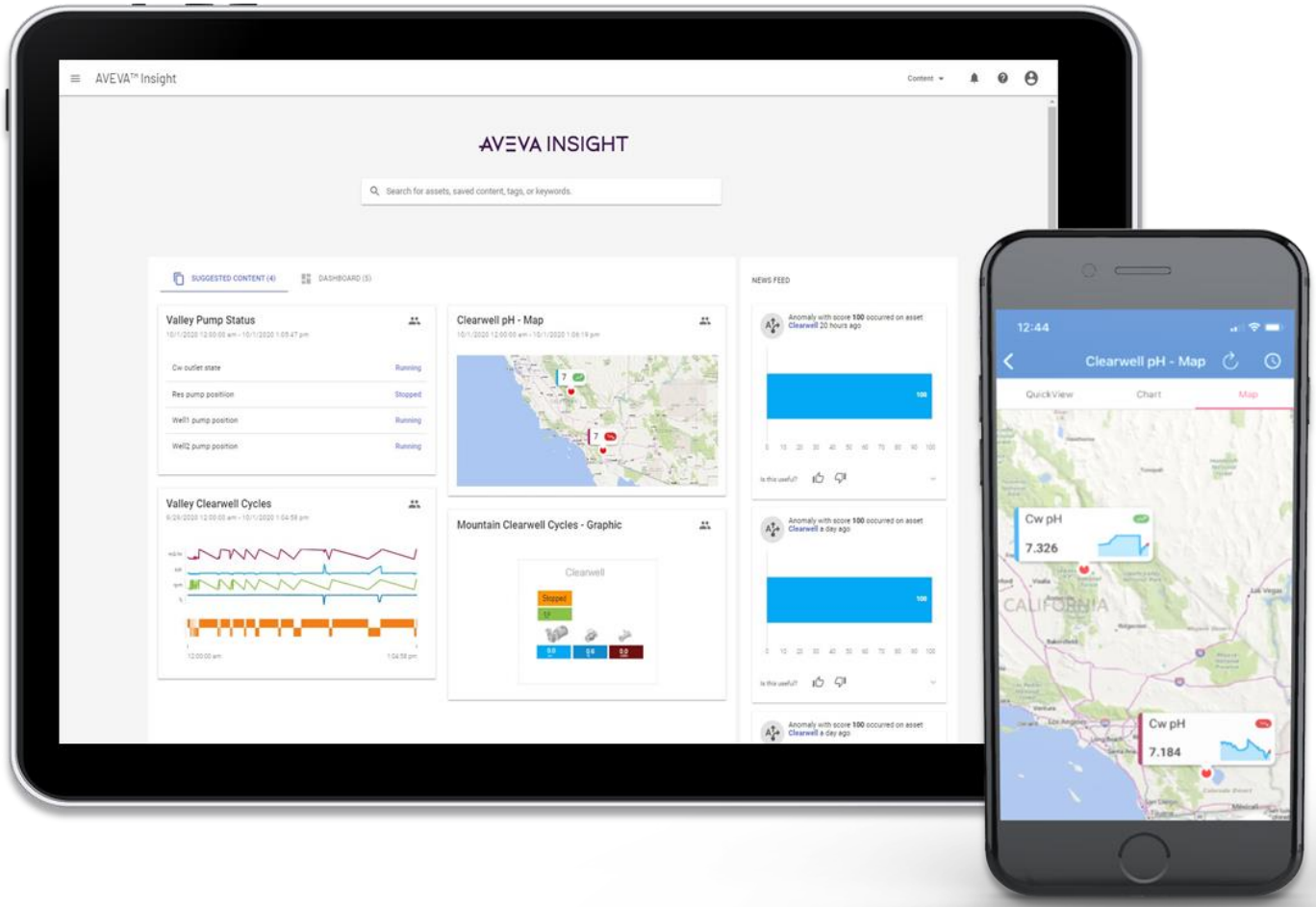
3D Models



Relationships

Documents

Mobile Capabilities



- Insight works on any device from any where
- Mobile application for native access
- Responsive Web Site

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Release Plans

AVEVA Insight / AVEVA Asset Information Management-Advanced Integration

Available Now	Lighthouse Release 1Q 2023	General Availability April 2023	2023 +
• AVEVA Insight • AVEVA Information Standards Manager • AVEVA Asset Information Management-Advanced	• Initial Feature set available for Lighthouse Program • Seeking AIM-A Customers to partner with us	• Search • Asset / Summary View • Dashboarding Widgets • Collections • Power BI Report View • Point Cloud Viewing	• Custom Query / Visual Query • Search Results / Saving • Document Mark Up • Enhanced 2D Document Viewing • Administrative Tools

AICPA SERVICE ORGANIZATIONS SOC aicpa.org/soc Formerly SAS 70 Reports

CSA cloud security alliance®

https://trust.aveva.com

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AVEVA

Learn more about AVEVA Connect & AVEVA Data Hub

Industrial Cloud Platform @ AVEVA PI World 2022 – San Francisco

Day 1: Industrial Cloud Platform

- AVEVA: AVEVA Connect, Industrial Cloud Platform – Vision, roadmap, and starting your operations and engineering digital twin journey [14:00]
- AVEVA: Power your secure industrial ecosystem of data, applications, and partners with AVEVA Data Hub connected communities [14:40]
- AVEVA: Accelerate Your Time to Value with Analytics and Applications Fueled by AVEVA Data Hub [15:40]
- AVEVA: On your marks, get set, Unleash your Operational Data in the Cloud! [16:20]
- AVEVA: Aggregating Engineering Content, Data and Documents and Real-Time Data into a Common User Experience [17:00]

Day 2: Customer Presentations

- Wood: Building a digital twin alongside the physical asset to unlock value across the full lifecycle at Wood [10:45]
- KBR: The complete digital twin at KBR [11:30]
- Kent: Asset Digital Thread [12:05]
- Saudi Aramco: 4IRC PI Based SOlutions and Applications [14:00]
- ENEOS: Facilities Reliability Improvement using Digital Twin Technology [14:35]
- ExxonMobil: A Practical Implementation of CFIHOS to meet Data Surveillance Needs [15:10]

Day 3: Industrial Cloud Platform

- AVEVA: Four Imperatives of a Trusted Information Infrastructure [10:45]
- AVEVA: Deploy Edge Data Store and Adapters in minutes with AVEVA Edge Management [11:25]
- AVEVA: Visualizing the Digital Twin, an Independent Service on the Industrial Cloud Platform [13:30]
- AVEVA: Uniting the connected community through secure and transparent industrial data sharing [14:25] [this talk]
- AVEVA: Harnessing the power of Sequential Data Store (Sds) and Assets for developers and partners [15:30]
- AVEVA: Aggregating data with Data Hub asset rules and data views for analytics and applications [16:25]

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State your name and company

Please remember to…

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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.

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