“There were 5 exabytes of information created between the dawn of civilization through 2003, but that much information is now created every two days.”

ERIC SCHMIDT, EXECUTIVE CHAIRMAN AT GOOGLE

OCTOBER 25, 2023

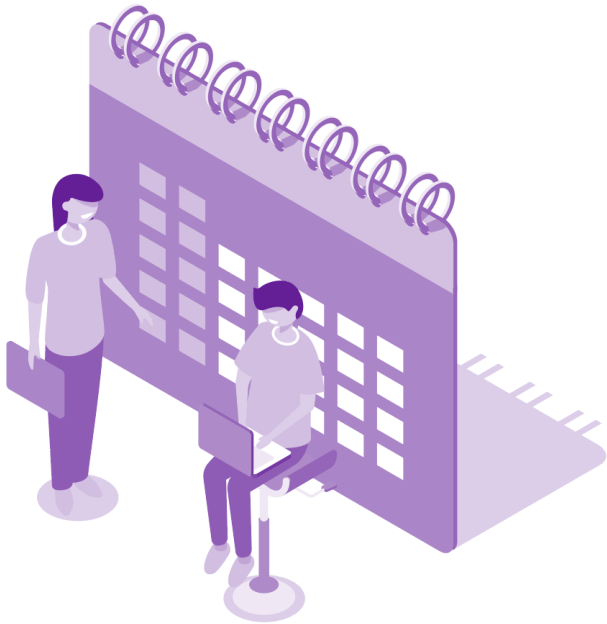
Information Management implementation journey: the MAIRE success story

Fabio Bitetto – Project Information Manager

Massimo Rosi – Engineering Processes Digitalization Head of Department

Agenda

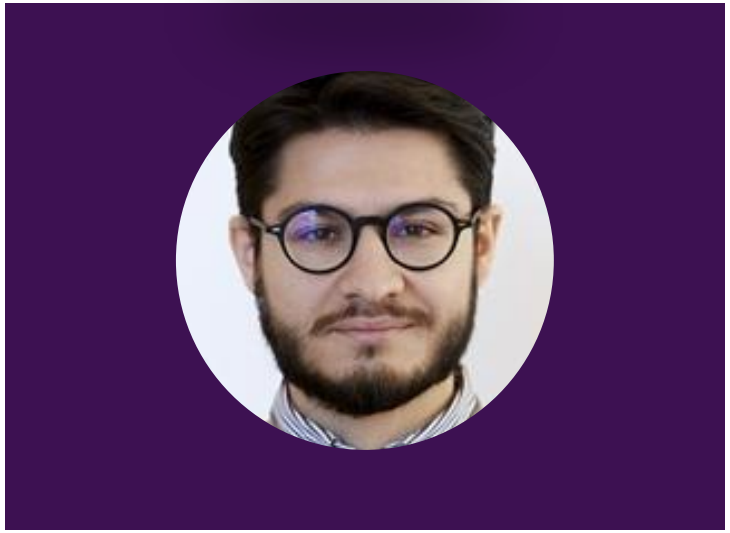
- MAIRE Digital Transformation Approach
- Information Management Challenges
- Information Management Framework
- Maire adoption deep dive
- Benefits and final conclusion
- Q&A



Massimo Rosi

Engineering Processes Digitalization Head of Department

- Tecnimont
- m.rosi@tecnimont.it



Fabio Bitetto

Project Information Manager

- Tecnimont
- f.bitetto@tecnimont.it

MAIRE INTEGRATED ORGANIZATION

SUSTAINABLE TECHNOLOGY SOLUTIONS

- NEXTCHEM Holding
- NEXTCHEM
- MYRECHEMICAL
- MYREPLAST Industries
- NEWCO CATC
- STAMICARBON
- CONSER

PROJECT DEVELOPMENT

- MET DEVELOPMENT

INTEGRATED E&C SOLUTIONS

- TECNIMONT
- KT
- MST

AVEVA

MAIRE CORE BUSINESS

We are enablers of innovation and energy transition, working alongside businesses to co-develop sustainable technologies and design integrated solutions in fertilizers, hydrogen, carbon capture & storage, fuels & chemicals, and polymers.

GLOBAL PRESENCE

6,451

TOTAL EMPLOYEES

~26,000

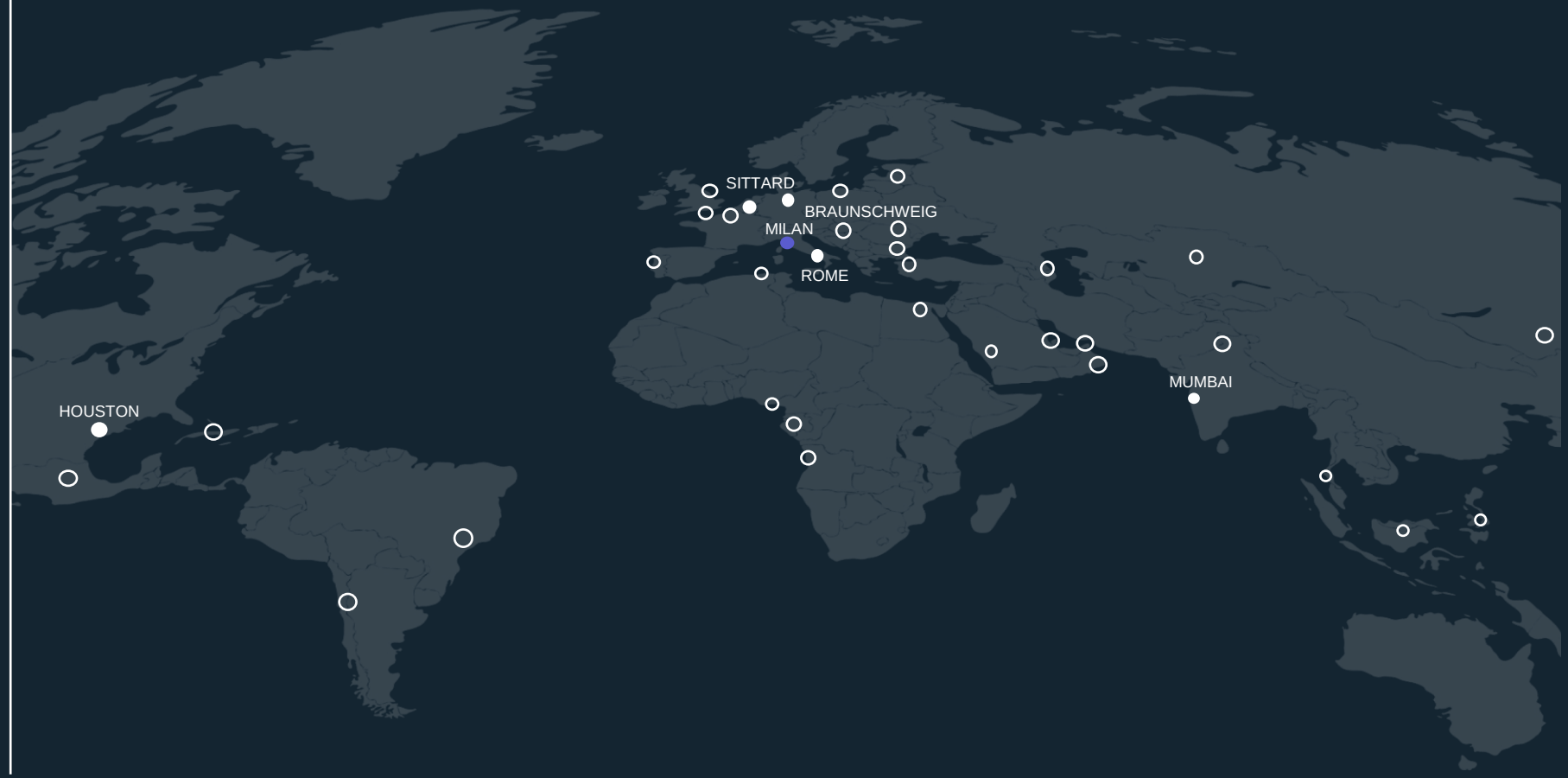
EMPLOYEES & PROFESSIONALS ENGAGED ON PROJECTS

~1,500

TOTAL DELIVERED PROJECTS

45

COUNTRIES



MAIRE Digital Transformation Approach

Enabler for reducing the Plant OPEX
up to 30% within 2030

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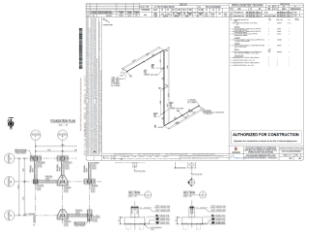
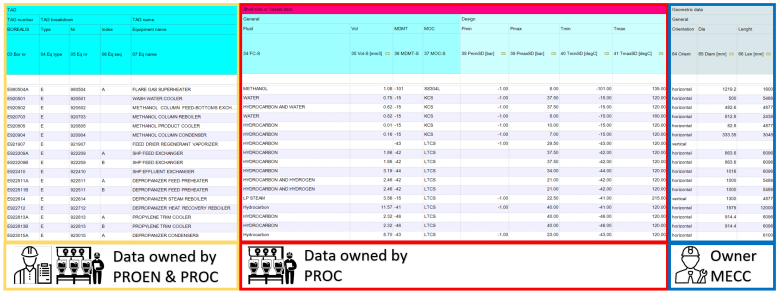
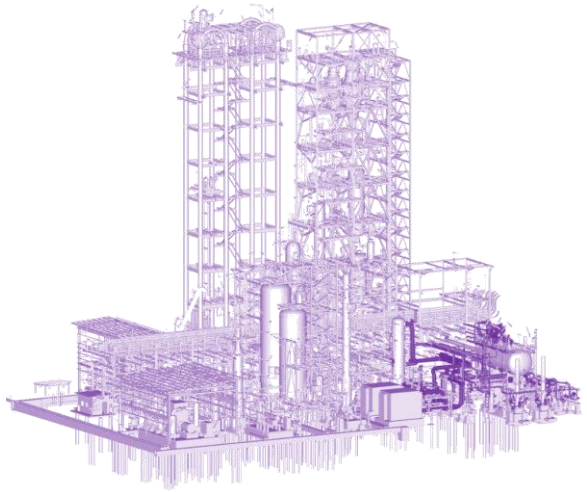
MAIRE Digital Transformation Approach: IM

Document Centric Approach



Data Centric Approach

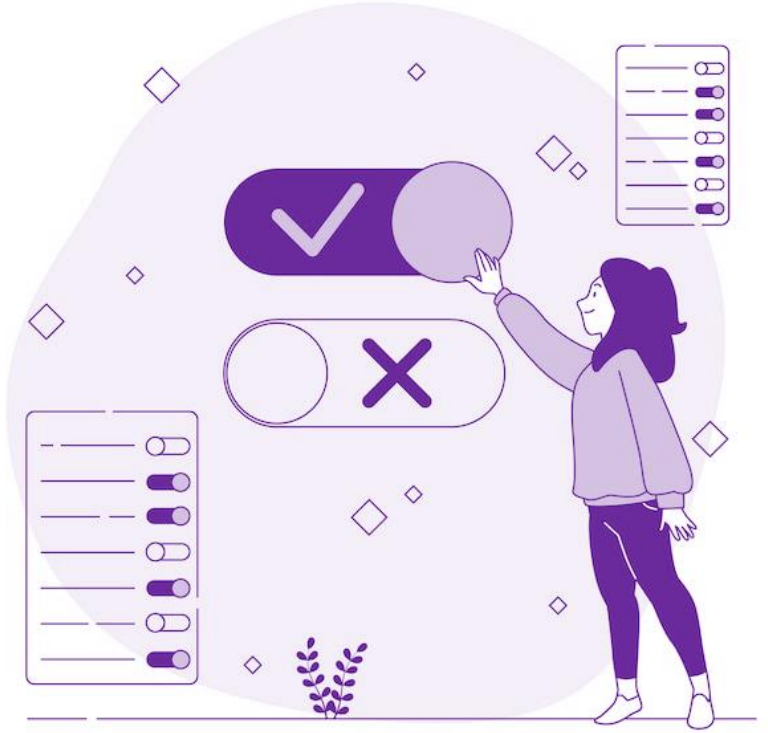




Information Management Challenges

Data Centric Approach **enables**

- Live data availability
- Process Automation
- Digitalization
- Data-driven Decision Making



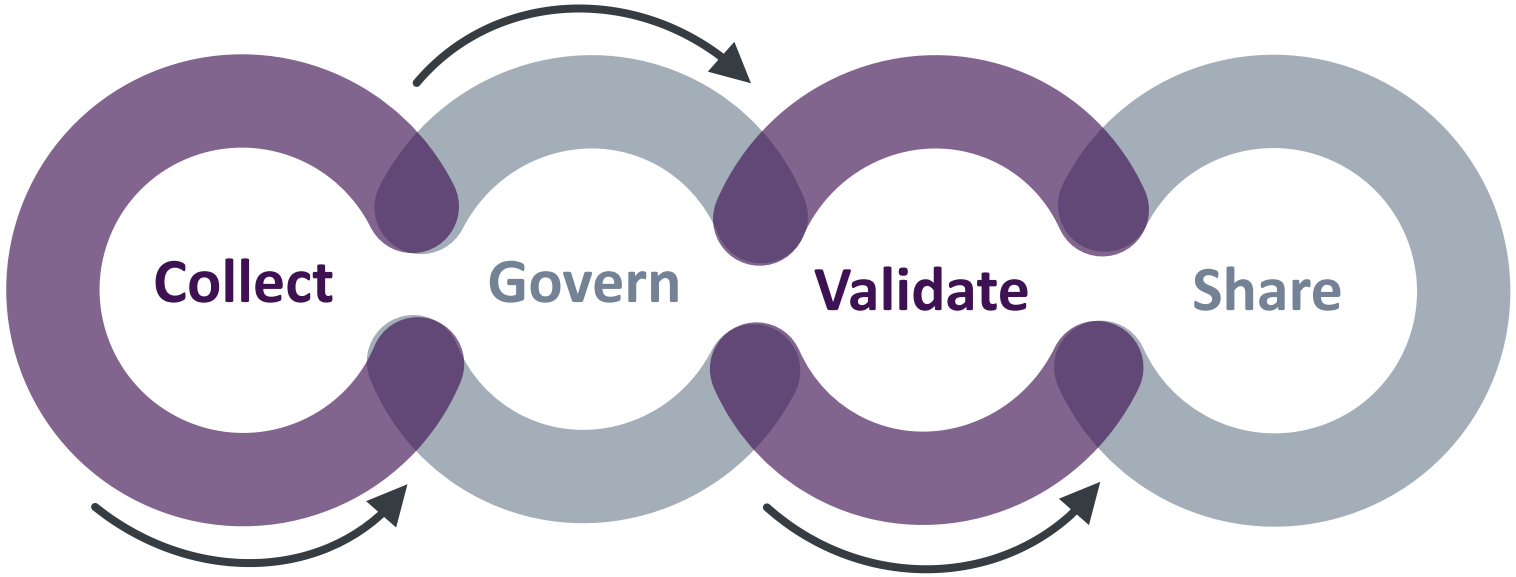
Information Management Challenges

But Data Centric Approach **could lead to**

- Data Redundancy
- Misinterpretation
- Usage of not-certified Data
- Operational Inefficiencies

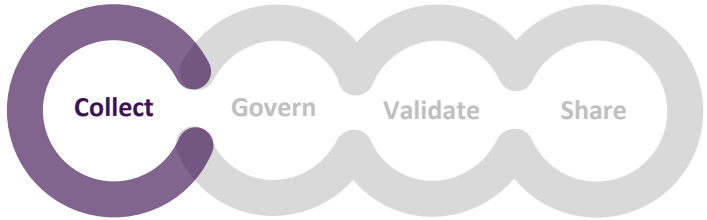
Information Management Challenges

Information Management Framework



Availability – Accuracy - Reliability – Accessibility

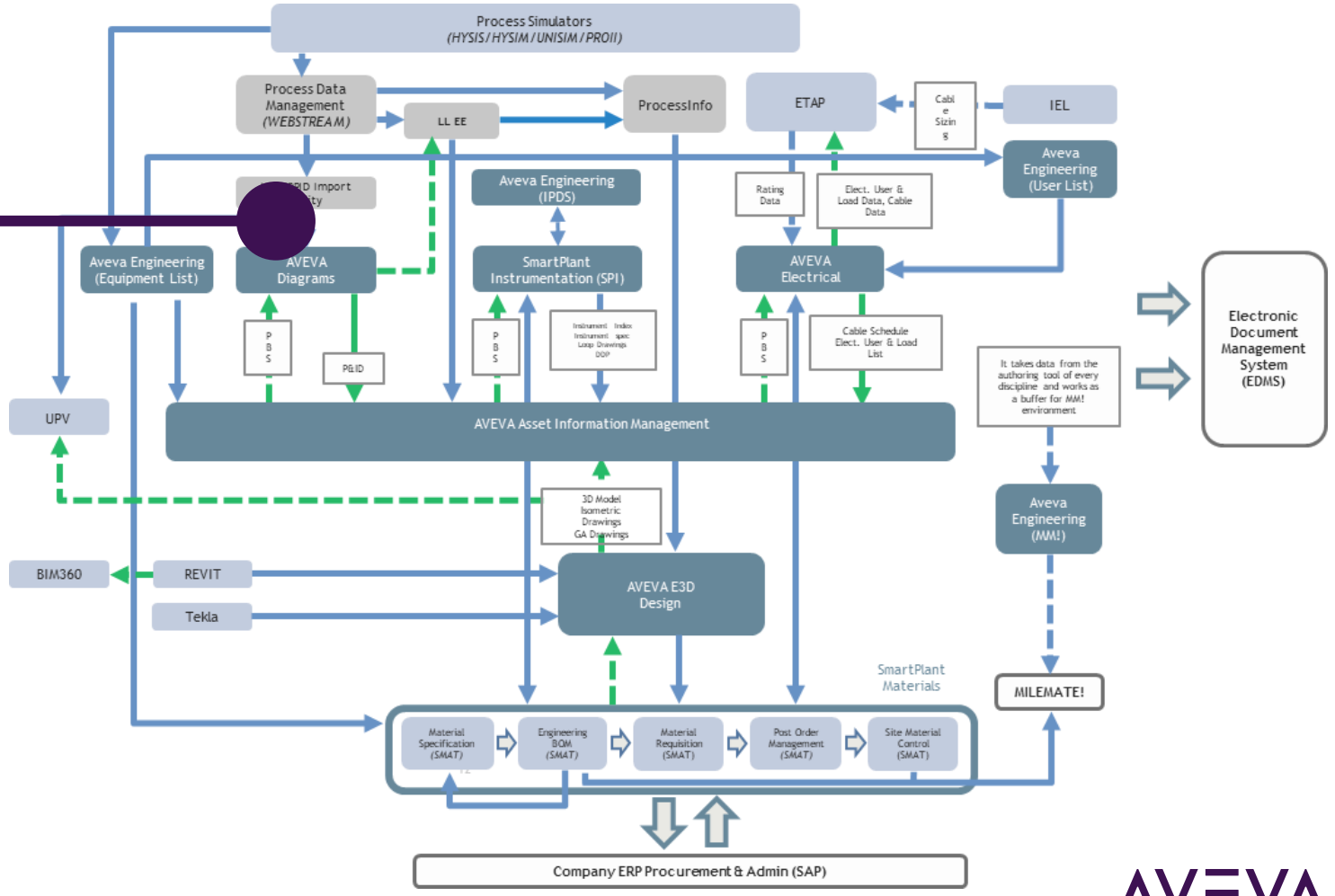
Information Management Framework



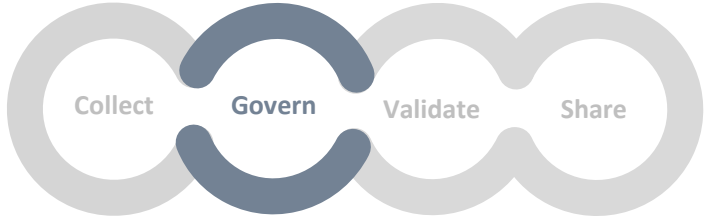
Data Collection

Data Production Layer

Engineering Data Sources used by disciplines during project execution



Information Management Framework

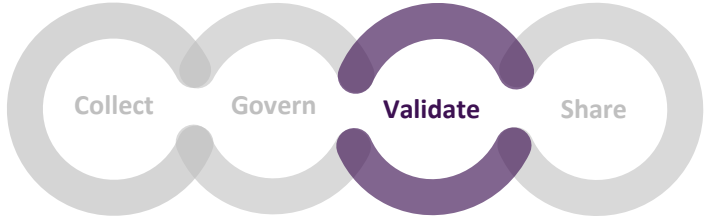


Data Governance

- **Data Standardization:** creation of Company standard CFIHOS compliant
- Data Harmonization
- Data Integration

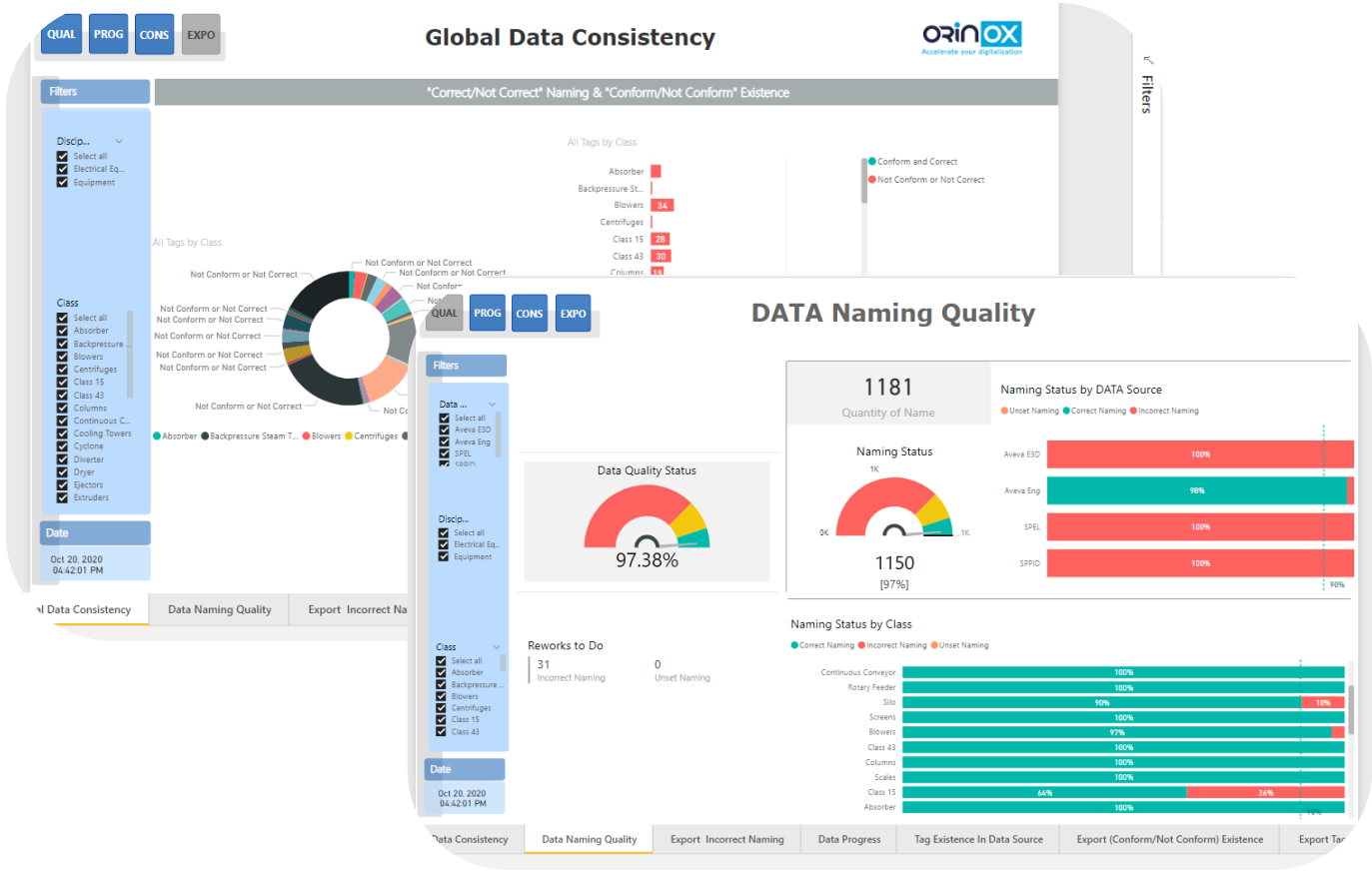
Class_Id	Class Name	Id	Attribute Name
FC-30001093	EXTRUDER	FA-00000326	driver type
FC-30001093	EXTRUDER	FA-00002289	type of working body
FC-30000339	FAN	FA-00000702	molecular weight at normal operating conditions
FC-30000339	FAN	FA-00000751	normal operating inlet pressure
FC-30000339	FAN	FA-00000763	normal operating inlet temperature
FC-30000339	FAN	FA-00001693	normal operating inlet volume flow rate
FC-30000339	FAN	FA-00000767	normal operating mass flow rate
FC-30000339	FAN	FA-00000770	normal operating outlet pressure
FC-30000339	FAN	FA-00000776	normal operating outlet temperature
FC-30000339	FAN	FA-00001694	normal operating outlet volume flow rate
FC-30000339	FAN	FA-00000777	normal operating power consumption
FC-30000339	FAN	FA-00000785	normal operating volume flow rate
FC-30000339	FAN	FA-00001643	driver equipment
FC-30000339	FAN	FA-00000326	driver type
FC-30000896	PUMP	FA-00000642	lower limit operating inlet pressure
FC-30000896	PUMP	FA-00000649	lower limit operating outlet pressure
FC-30000896	PUMP	FA-00000655	lower limit operating volume flow rate
FC-30000896	PUMP	FA-00000712	net positive suction head available at normal operating
FC-30000896	PUMP	FA-00000738	normal operating dynamic viscosity
FC-30000896	PUMP	FA-00000751	normal operating inlet pressure
FC-30000896	PUMP	FA-00000763	normal operating inlet temperature
FC-30000896	PUMP	FA-00000764	normal operating liquid density
FC-30000896	PUMP	FA-00000767	normal operating mass flow rate
FC-30000896	PUMP	FA-00000770	normal operating outlet pressure

Information Management Framework



Data Validation

- Tag & Property Quality Check
- Data Consistency
- **Data Certification**



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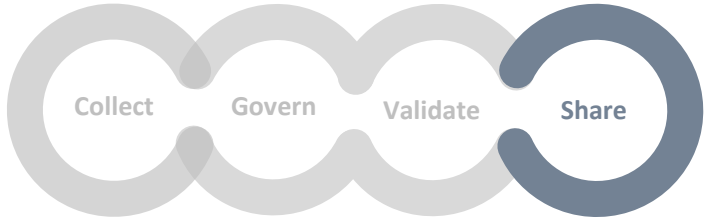
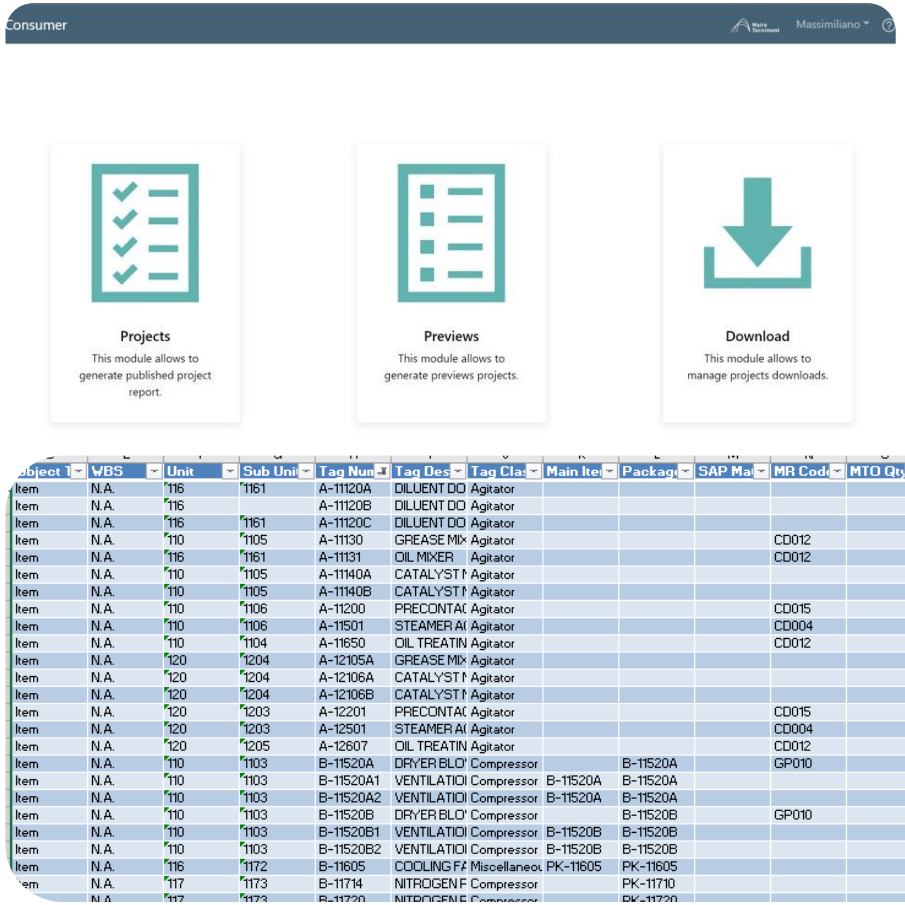
Information Management Framework



Data Sharing

- Common **shared environment**
- Integration with **downstream processes**
- **Early data visibility** to final clients



Object T	WBS	Unit	Sub Uni	Tag Nun	Tag Des	Tag Cla	Main Ite	Packag	SAP Ma	MR Cod	MTO Qt	UoM	MTO Un	Qty MR I	PO Cod
Item	N.A.	116	1161	A-11120A	DILUENT DO	Agitator					1				
Item	N.A.	116		A-11120B	DILUENT DO	Agitator					1				
Item	N.A.	116	1161	A-11120C	DILUENT DO	Agitator					1				
Item	N.A.	110	1105	A-11130	GREASE MIX	Agitator				CD012	1	PCS		1	7500099008
Item	N.A.	116	1161	A-11131	OIL MIXER	Agitator				CD012	1	PCS		1	7500099008
Item	N.A.	110	1105	A-11140A	CATALYST I	Agitator					1				
Item	N.A.	110	1105	A-11140B	CATALYST I	Agitator					1				
Item	N.A.	110	1106	A-11200	PRECONTAC	Agitator				CD015	1	PCS		1	7500102556
Item	N.A.	110	1106	A-11501	STEAMER AC	Agitator				CD004	1	PCS		1	7500097594
Item	N.A.	110	1104	A-11650	OIL TREATIN	Agitator				CD012	1	PCS		1	7500099008
Item	N.A.	120	1204	A-12105A	GREASE MIX	Agitator					1				
Item	N.A.	120	1204	A-12106A	CATALYST I	Agitator					1				
Item	N.A.	120	1204	A-12106B	CATALYST I	Agitator					1				
Item	N.A.	120	1203	A-12201	PRECONTAC	Agitator				CD015	1	PCS		1	7500102556
Item	N.A.	120	1203	A-12501	STEAMER AC	Agitator				CD004	1	PCS		1	7500097594
Item	N.A.	120	1205	A-12607	OIL TREATIN	Agitator				CD012	1	PCS		1	7500099008
Item	N.A.	110	1103	B-11520A	DRYER BLO	Compressor		B-11520A		GP010	1	PCS		1	7500103735
Item	N.A.	110	1103	B-11520A1	VENTILATIOI	Compressor	B-11520A	B-11520A			1				
Item	N.A.	110	1103	B-11520A2	VENTILATIOI	Compressor	B-11520A	B-11520A			1				
Item	N.A.	110	1103	B-11520B	DRYER BLO	Compressor		B-11520B		GP010	1	PCS		1	7500103735
Item	N.A.	110	1103	B-11520B1	VENTILATIOI	Compressor	B-11520B	B-11520B			1				
Item	N.A.	110	1103	B-11520B2	VENTILATIOI	Compressor	B-11520B	B-11520B			1				
Item	N.A.	116	1172	B-11605	COOLING FA	Miscellaneou	PK-11605	PK-11605			1				
Item	N.A.	117	1173	B-11714	NITROGEN F	Compressor		PK-11710			1				

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Information Management Challenges

Advantages

DATA OWNER

- Improving **data quality** and reducing **information duplication**
- Planning **how, when** and **why** information is shared and released
- Reducing the cost of **managing** and **sharing** data
- Providing the building blocks for **data-driven decision-making**

DATA CONSUMER

- Making data **easier** to **find**, **access** and **use**
- Reducing the risk associated with **poorly managed** data
- Increasing **productivity** through the availability and use of data
- Integrate **downstream** processes
- **Early data visibility** to client that can start populating **operational tools**

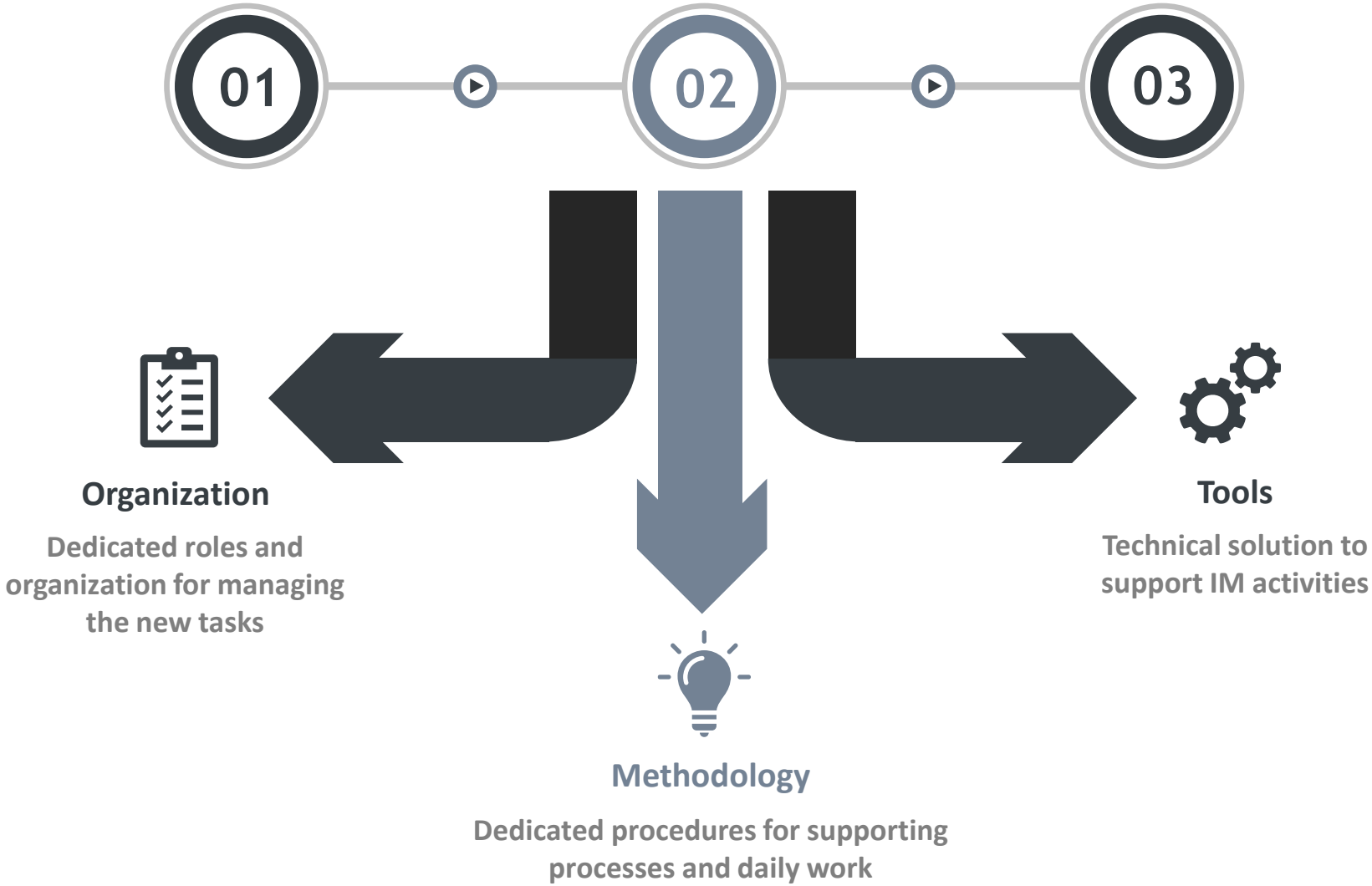
Risks

- To much data to handle: **inefficiencies**
- IM activities perceived by the project's staff as **burdensome** and **unnecessary**

Information Management Lean Process

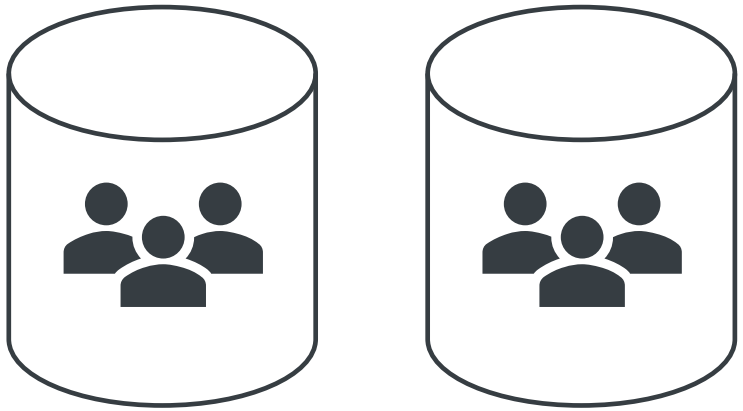
AVEVA

MAIRE adoption deep dive



MAIRE adoption deep dive: Organization

Dedicated IM structure,
separated from project staff



- IM activities perceived **far** from project needs.
- Work with a **silos** approach.

Decentralized organization with **dedicated focal point** inside project task.
Information Manager as a **unique** reference and coordinator for IM.

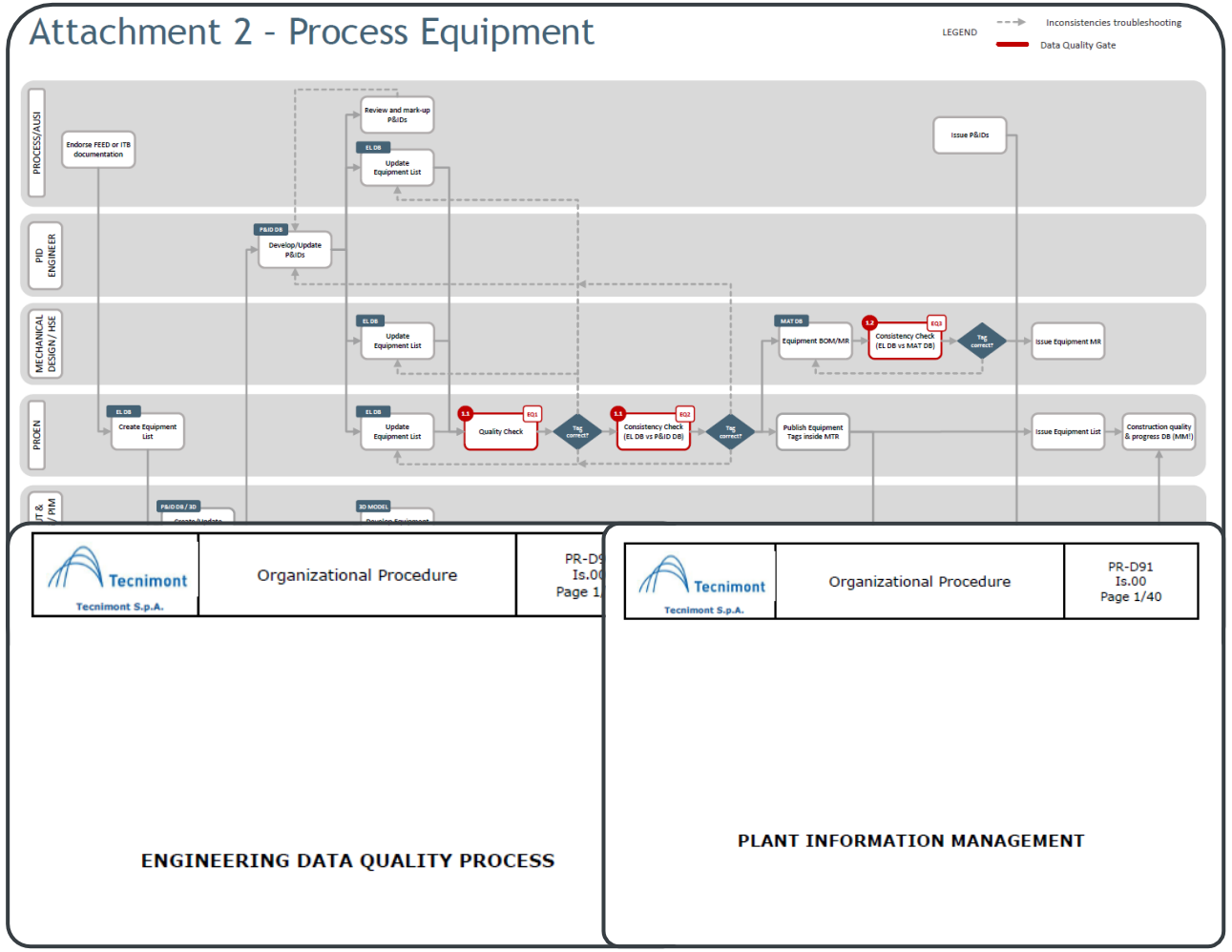
- Project staff **engagement**.
- **Daily tasks** organized with a data quality and **IM perspective**.

MAIRE adoption deep dive: Methodology

IM processes are supported by company's **procedures** that clearly defines how data are **created**, **managed**, **validated** and **published** by each disciplines.

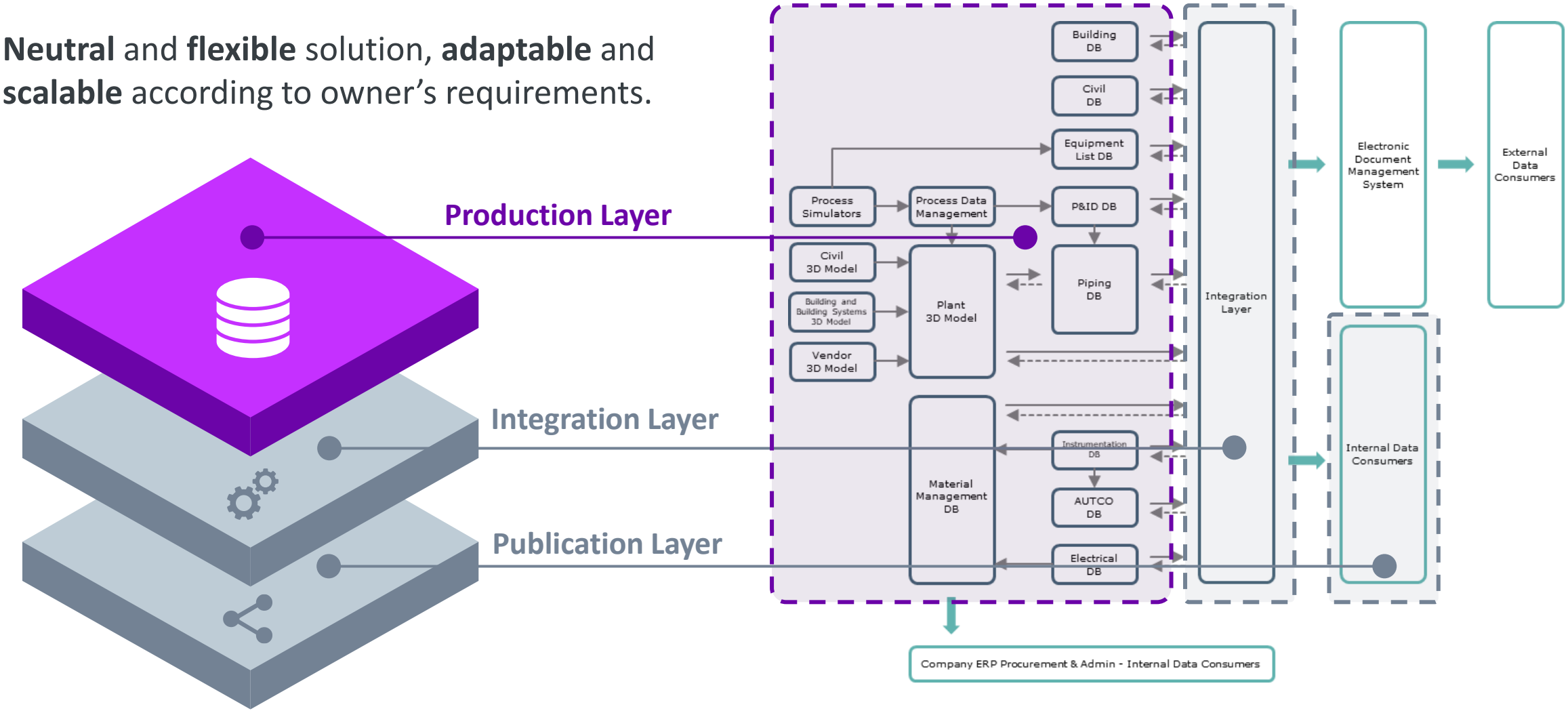
In the perspective of a **lean approach**, these procedures are manly focused on:

- Item **Tag** quality in terms of correctness and consistency;
- A **minimum** required **set** of **data** extracted from the CFIHOS standard.

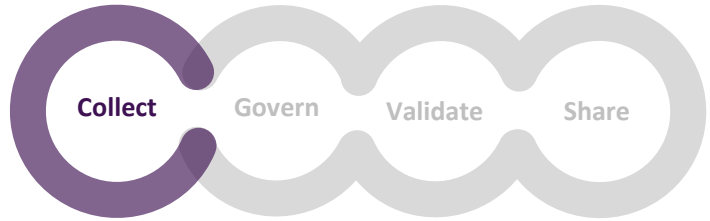


MAIRE adoption deep dive: Tools

Neutral and **flexible** solution, **adaptable** and **scalable** according to owner's requirements.



MAIRE adoption deep dive: Tools



Data Collection

AVEVA Authoring Tools

AVEVA™ Engineering for Equipment Data (company standard)

- Data Centralization;
- Data Ownership;
- Data Standardization;
- Data Quality at source.

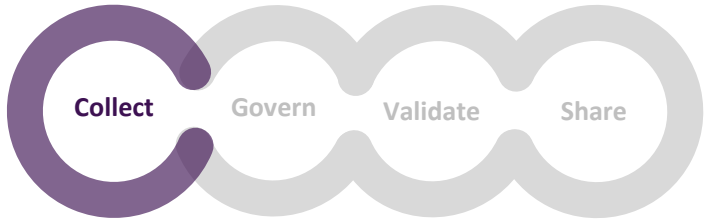
TAG					Shell side or Vessel data								Geometric data		
TAG number	TAG breakdown			TAG name	General				Design				General		
BOREALIS	Type	Nr	Index	Equipment name	Fluid	Vol	MDMT	MOC	Pmin	Pmax	Tmin	Tmax	Orientation	Dia	Lenght
03 Bor nr	04 Eq type	05 Eq nr	06 Eq seq	07 Eq name	34 FC-S	35 Vol-S [mm3]	36 MDMT-S	37 MOC-S	38 PminSD [bar]	39 PmaxSD [bar]	40 TminSD [degC]	41 TmaxSD [degC]	64 Orient	65 Diam [mm]	66 Len [mm]
E980504A	E	980504	A	FLARE GAS SUPERHEATER	METHANOL	1.08	-101	SS304L	-1.00	8.00	-101.00	135.00	horizontal	1219.2	1600
E920501	E	920501		WASH WATER COOLER	WATER	0.75	-15	KCS	-1.00	37.50	-15.00	120.00	horizontal	500	5486
E920502	E	920502		METHANOL COLUMN FEED-BOTTOMS EXCH...	HYDROCARBON AND WATER	0.62	-15	KCS	-1.00	37.50	-15.00	120.00	horizontal	482.6	4877
E920703	E	920703		METHANOL COLUMN REBOILER	WATER	0.82	-15	KCS	-1.00	8.00	-15.00	160.00	horizontal	812.8	2438
E920805	E	920805		METHANOL PRODUCT COOLER	HYDROCARBON	0.01	-15	KCS	-1.00	10.00	-15.00	120.00	horizontal	82.8	4877
E920904	E	920904		METHANOL COLUMN CONDENSER	HYDROCARBON	0.16	-15	KCS	-1.00	7.00	-15.00	120.00	horizontal	333.35	3048
E921907	E	921907		FEED DRIER REGENERANT VAPORIZER	HYDROCARBON		-43	LTCS	-1.00	29.50	-43.00	120.00	vertical		
E922209A	E	922209	A	SHP FEED EXCHANGER	HYDROCARBON	1.86	-42	LTCS		37.50	-42.00	120.00	horizontal	863.6	6096
E922209B	E	922209	B	SHP FEED EXCHANGER	HYDROCARBON	1.86	-42	LTCS		37.50	-42.00	120.00	horizontal	863.6	6096
E922410	E	922410		SHP EFFLUENT EXCHANGER	HYDROCARBON	3.19	-44	LTCS		34.00	-44.00	120.00	horizontal	1016	6096
E922511A	E	922511	A	DEPROPANIZER FEED PREHEATER	HYDROCARBON AND HYDROGEN	2.46	-42	LTCS		21.00	-42.00	120.00	horizontal	1000	5486
E922511B	E	922511	B	DEPROPANIZER FEED PREHEATER	HYDROCARBON AND HYDROGEN	2.46	-42	LTCS		21.00	-42.00	120.00	horizontal	1000	5486
E922614	E	922614		DEPROPANIZER STEAM REBOILER	LP STEAM	3.56	-15	LTCS	-1.00	22.50	-41.00	215.00	vertical	1300	4877
E922712	E	922712		DEPROPANIZER HEAT RECOVERY REBOILER	Hydrocarbon	11.57	-41	LTCS	-1.00	40.00	-41.00	120.00	horizontal	1575	12000
E922813A	E	922813	A	PROPYLENE TRIM COOLER	HYDROCARBON	2.32	-46	LTCS		40.00	-46.00	120.00	horizontal	914.4	6096
E922813B	E	922813	B	PROPYLENE TRIM COOLER	HYDROCARBON	2.32	-46	LTCS		40.00	-46.00	120.00	horizontal	914.4	6096
E923015A	E	923015	A	DEPROPANIZER CONDENSERS	Hydrocarbon	8.70	-43	LTCS	-1.00	23.00	-43.00	120.00	horizontal		6100

Data owned by PROEN & PROC

Data owned by PROC

Owner MECC

MAIRE adoption deep dive: Tools

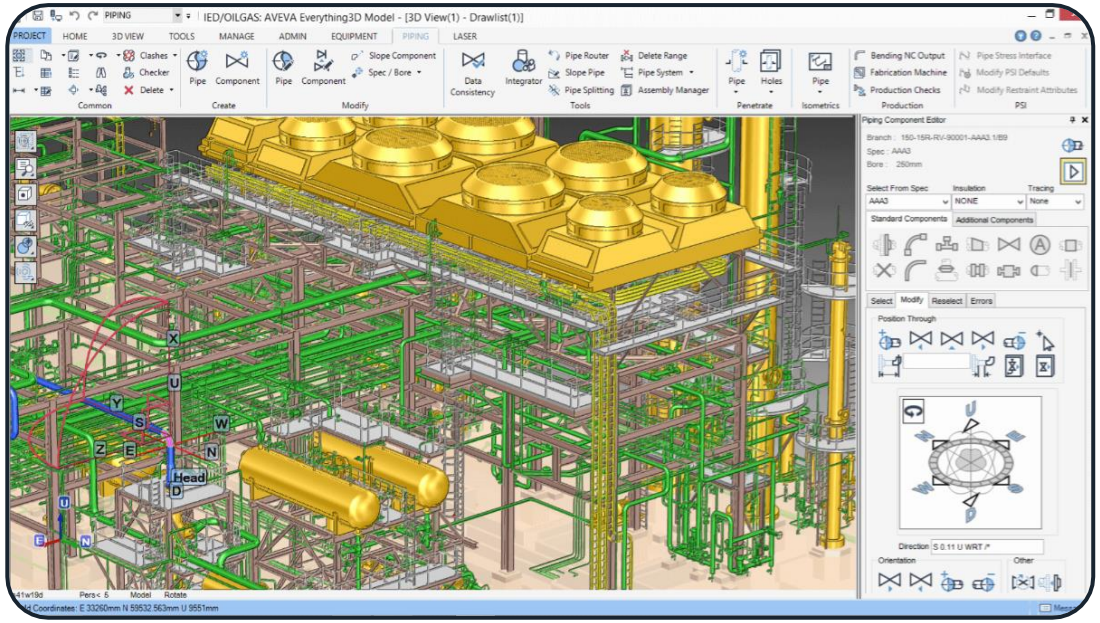


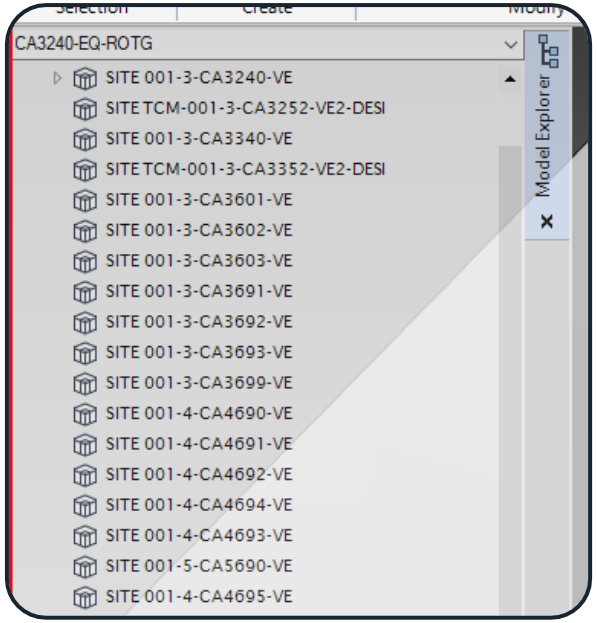
Data Collection

AVEVA Authoring Tools

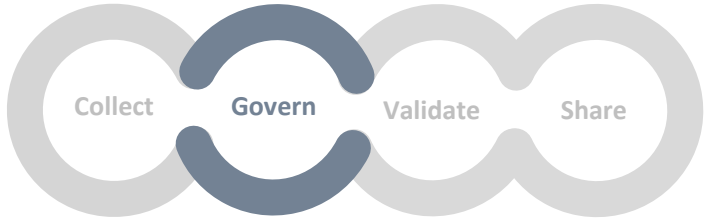
Other examples:

- AVEVA™ E3D Design (based on project requirements);
- AVEVA™ Electrical (company standard).



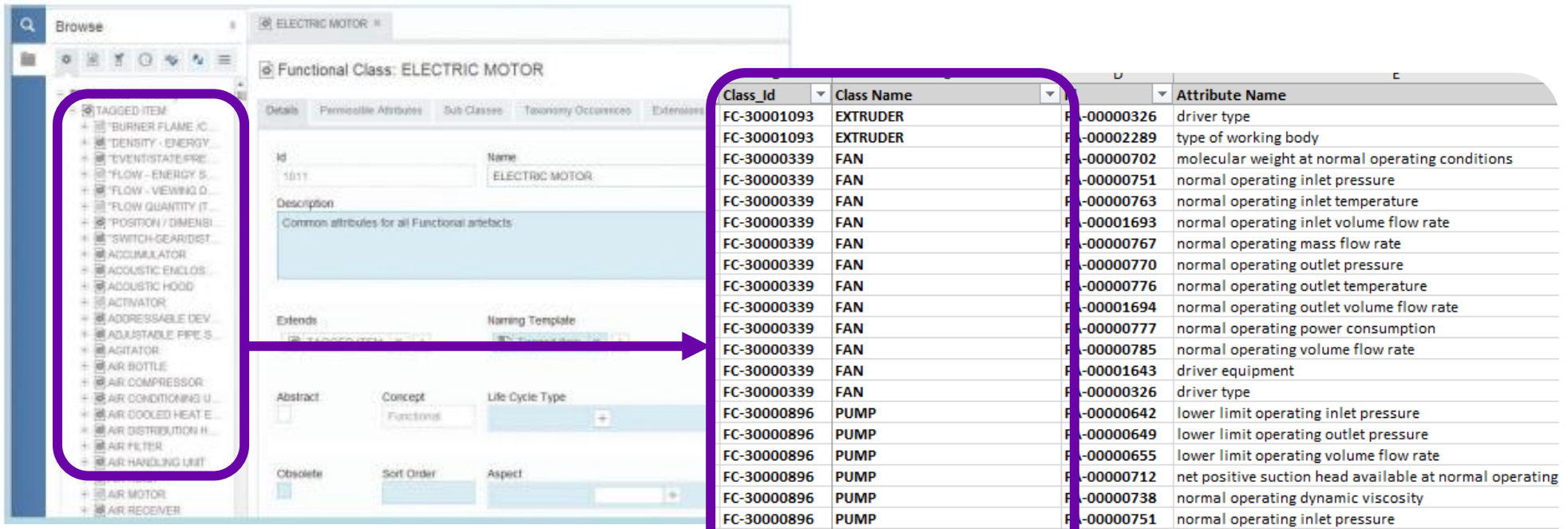


MAIRE adoption deep dive: Tools



Data Governance

AVEVA™ Information Standards Manager for Data Standardization (company standard)



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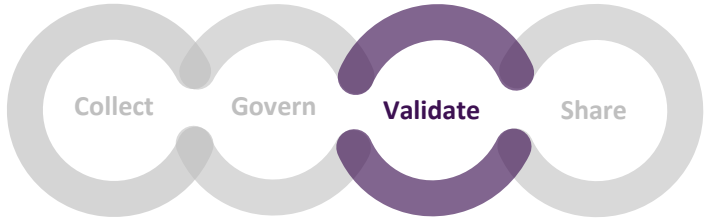
FC-30000896	PUMP	PA-00000763	normal operating inlet temperature
FC-30000896	PUMP	PA-00000764	normal operating liquid density
FC-30000896	PUMP	PA-00000767	normal operating mass flow rate
FC-30000896	PUMP	PA-00000770	normal operating outlet pressure

AVEVA

MAIRE adoption deep dive: Tools

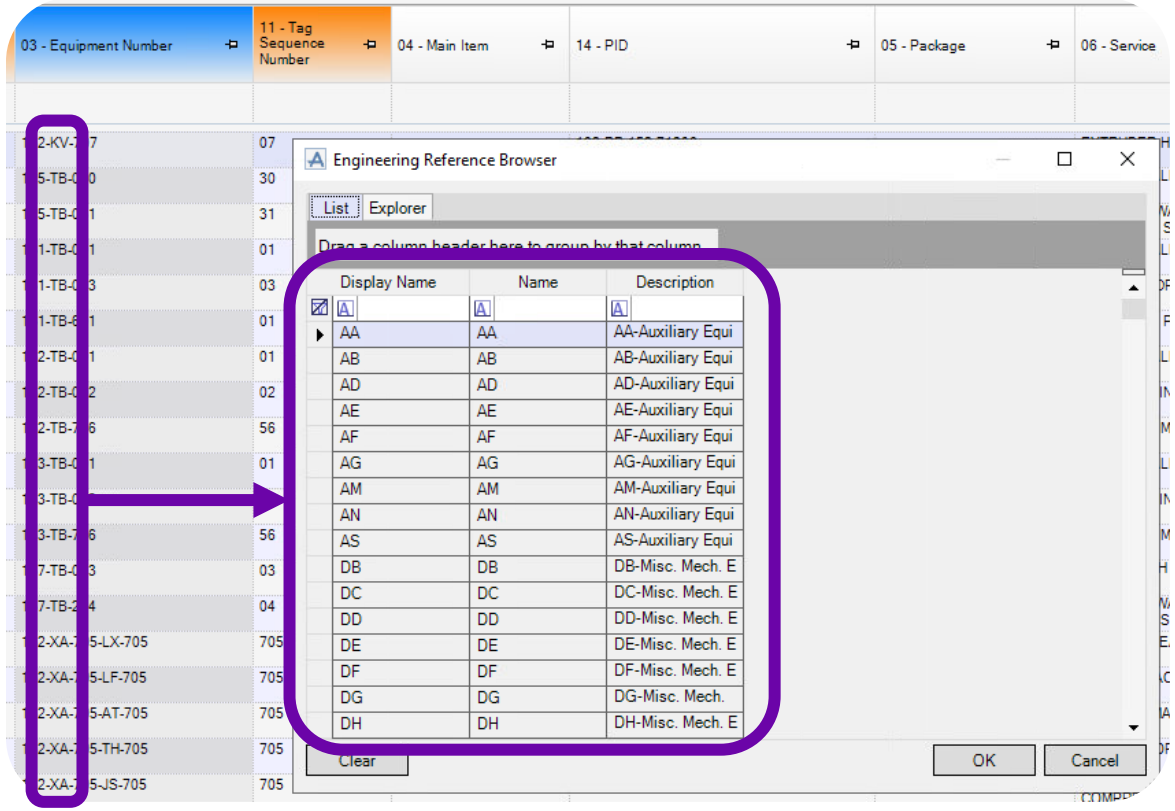


Data Quality

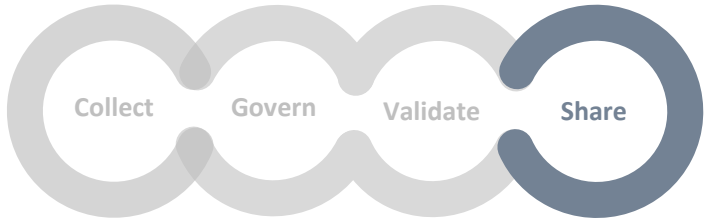
AVEVA™ Engineering

AVEVA™ E3D Design

- Custom Rule for Object Tag validation;
- Check on Property Data Type;
- Custom PickList according to the data model.



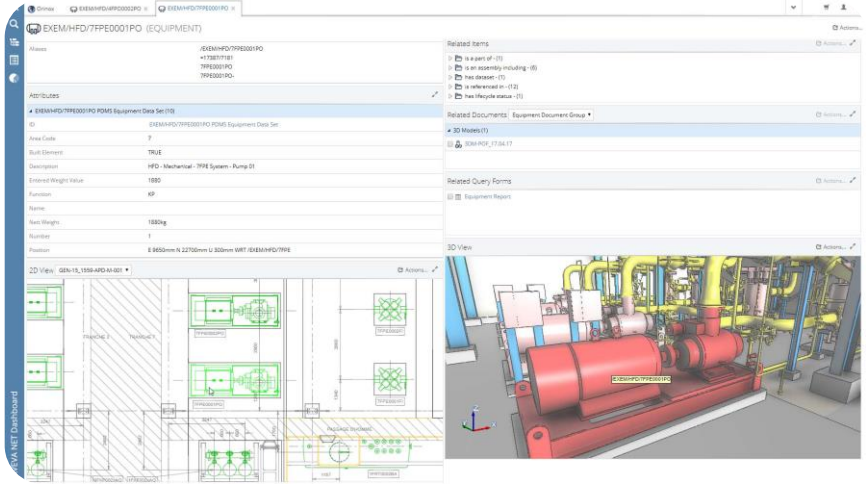
MAIRE adoption deep dive: Tools

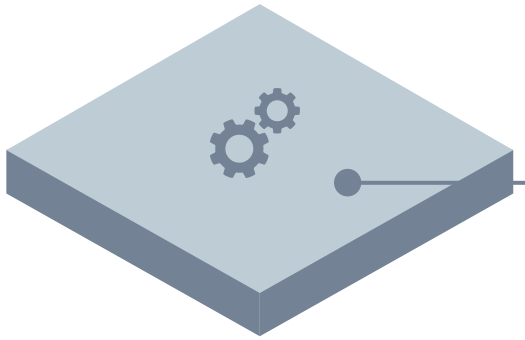


Data Sharing

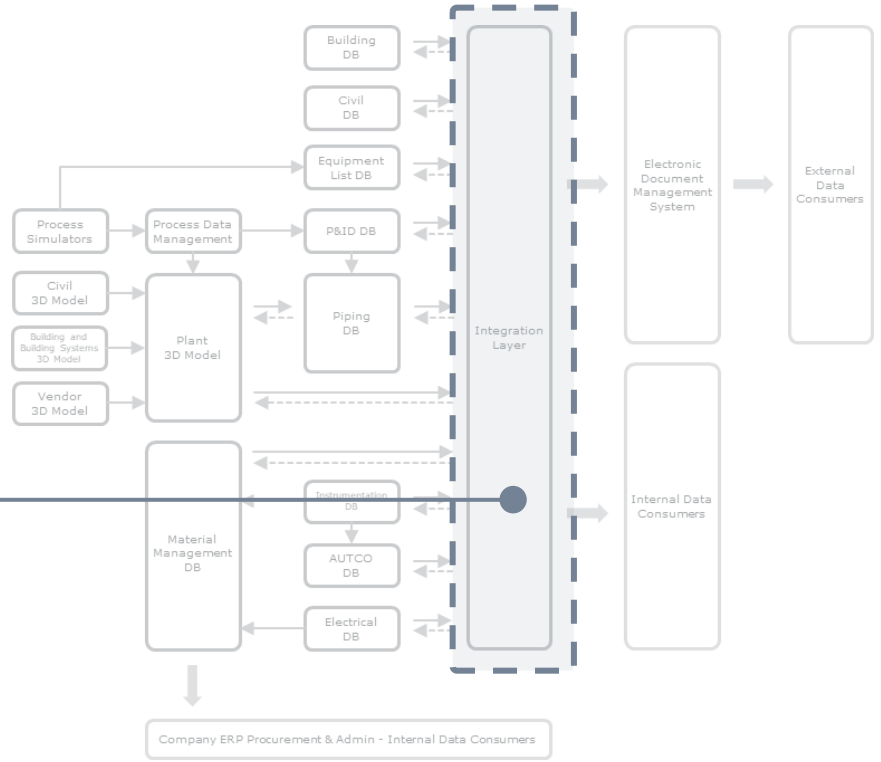
AVEVA™ Asset Information Management

AVEVA™ Asset Information Management is used as **integration layer** in case is required by Owner. Anyhow it could be **connected** to Tecnimont's **proprietary integration solution**, used to feed internal and, eventually, external data consumers.

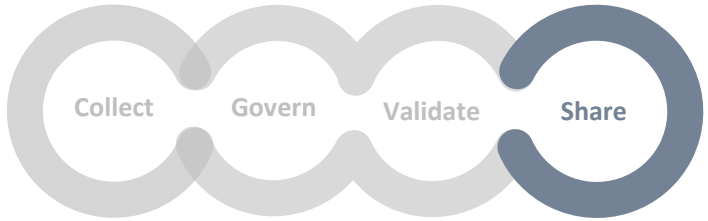




Integration Layer



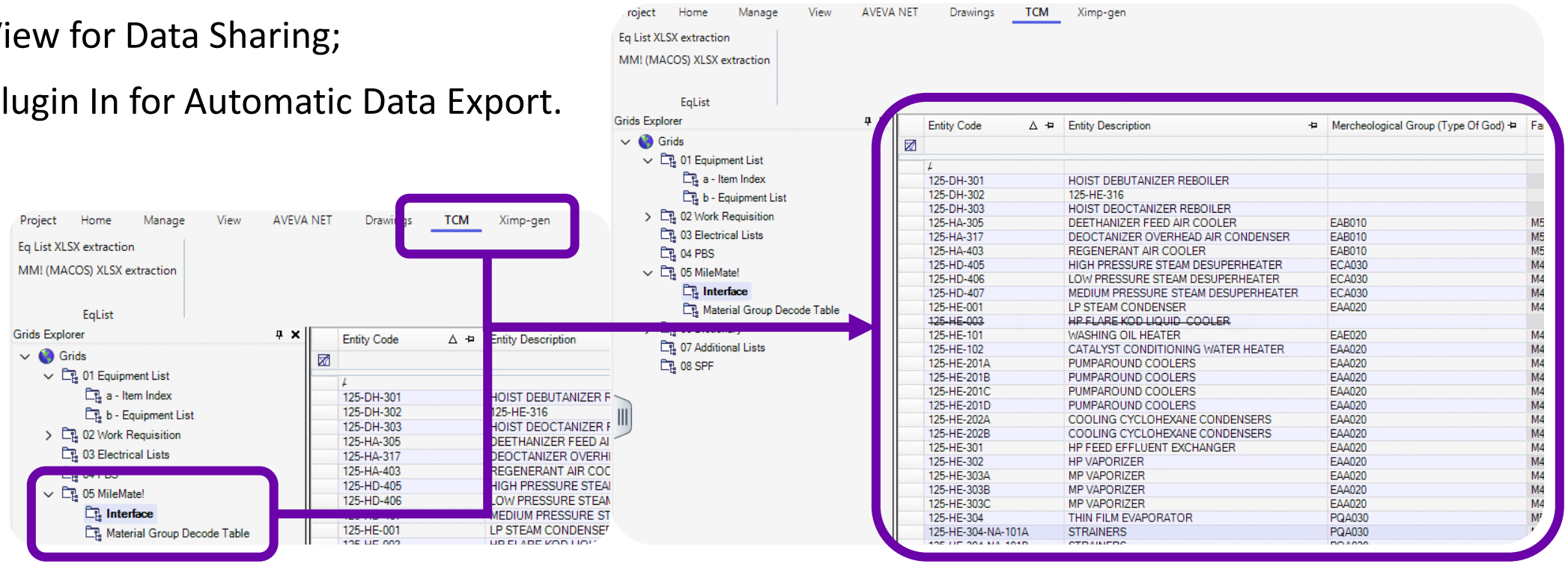
MAIRE adoption deep dive: Tools



Data Sharing

AVEVA™ Engineering

- Custom View for Data Sharing;
- Custom Plugin In for Automatic Data Export.



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Benefits

- **Improved Data Quality**: significant increase in data accuracy, reducing errors and discrepancies by 15%.
- **Cost Savings**: By optimizing data management processes, the project achieves a manhours cost savings of 10%;
- **More efficient final handover**: By adopting an information management approach from the beginning and during daily work, project achieves a manhours cost savings of 20%;
- **Project Monitoring and Control**: decrease in project deviations, better risk management, and timely mitigation of issues;
- **Improved Decision-Making**;
- **Scalability and Reusability**: reduction in setup and configuration time for subsequent projects;
- **Customer Satisfaction**.

TECNIMONT

ENERGY, OIL & GAS | ITALY

Tecnimont achieves a manhours cost savings of 10% optimizing data management processes

Challenge

- Streamlining Data Integration;
- Ensuring Data Standardization, Data Accuracy and Consistency;
- Enhancing Project Efficiency and Productivity;
- Facilitating Long-Term Information Lifecycle Management.

Solution

- Deployed Information Management lean processes supported by AVEVA Product.

Results

- **Improved Data Quality:** The implementation of information management lean process and CFIHOS standard results in a significant increase in data accuracy, **reducing errors and discrepancies by 15%**;
- **Cost Savings:** By optimizing data management processes, the project achieves a manhours **cost savings of 5%** through reduced manual data entry, improved data quality, and more efficient final handover.

“Information is only as reliable as the people who are receiving it.”

JULIA KOLLER, A LEARNING SOLUTIONS LEAD DEVELOPER

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 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

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