EPC Digital Platform

SAIPEM

AVEVA WORLD Conference

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SAIPEM IN THE WORLD

KEY FIGURES

> 30,000
EMPLOYEES WORLDWIDE

> 130
DIFFERENT NATIONALITIES

6 PREFABRICATION YARDS
Arbatax (Italy), Guarujà (Brazil), Ambriz (Angola), Dammam (Saudi Arabia), Karimun (Indonesia), Rumuolumeni (Nigeria)

11,874 M €
2023 REVENUE

926 M €
2023 ADJUSTED EBITDA

482 M €
2023 CAPITAL EXPENDITURE

2,519
ACTIVE PATENTS

data as of 2023

Engineering centres Prefabrication yards Other relevant sites

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ONE SAIPEM, ONE CONTRACTOR

ASSET BASED SERVICES

Offshore E&C

- Comprehensive offshore construction fleet
- Numerous yards located in key areas for the industry
- Shallow waters platforms, flowlines, EPCI & T&I
- SURF (Subsea, Umbilicals, Risers & Flowlines)
- MMO & Decommissioning

ENERGY CARRIERS

Onshore E&C

- Upstream
- Floaters & GBS
- LNG & Regas plants
- Gas monetization
- Biofuels
- CCUS Hubs
- O&M Services

DRILLING OFFSHORE

Our drilling fleet is capable of operating at all depths

- Ultra deepwater vessels with dual derrick capacity
- Semi-submersible vessel for harsh environments
- Rejuvenated jack up fleet for shallow waters

ROBOTICS AND INDUSTRIALIZED SOLUTIONS

- CO_2 Solutions
- Green hydrogen
- Green ammonia
- Plastic Recycling
- Underwater robotics
- Subsea Factory

OFFSHORE WIND

Fixed Wind

- Foundations
- Offshore Substations
- Jackets Supply & Fabrication
- O&M and Robotics for Life of Field Services
- EPCI, T&I schemes

Floating Wind

- Foundation technologies (Hexafloat & STAR-1)
- O&M and Robotics for Life of Field Services
- EPCI, T&I schemes

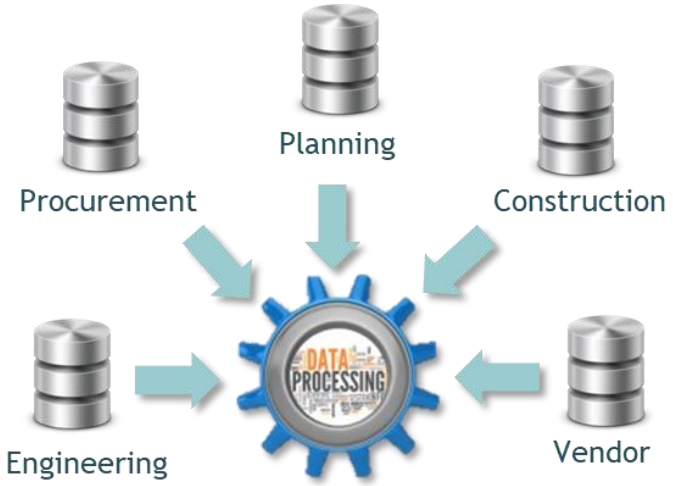
SUSTAINABLE INFRASTRUCTURES

- HC/HS railways
- Subways and tramways
- High-end services for infrastructural works monitoring and efficiency improvement

EPC DIGITAL TRANSFORMATION

Help me LEARN

Big Data Analytics



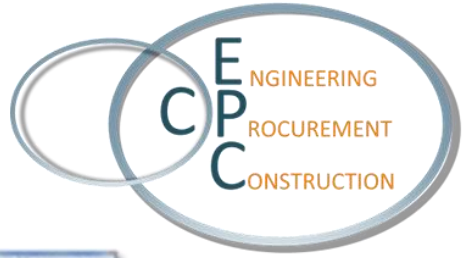
Collecting and structure from multiple sources

- ✓ Improve Control
- ✓ Foster Performance

Help me PERFORM

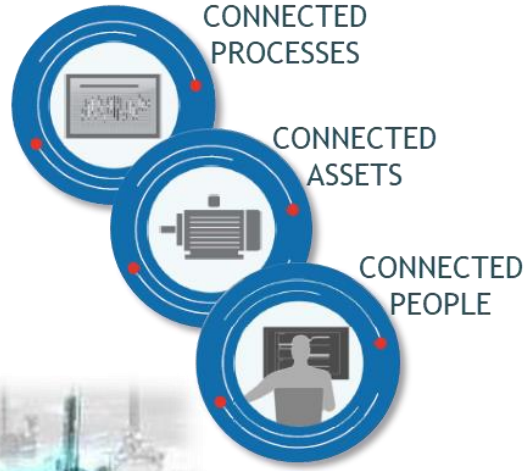
EPC Plant Information Model

- ✓ C-EPC Data Integration
- ✓ Improve Detail Design development process
- ✓ Increase Supply Chain visibility
- ✓ Enable advanced Construction Planning and Monitoring
- ✓ Close out Data Valorization



Help me SUPPLY

Client Digital Collaboration



- ✓ Improve reliability management
- ✓ Maximize process performances
- ✓ Minimize CO_2 emissions
- ✓ Reduce site costs

EPC DIGITAL PLATFORM

THE REASON WHY

Bring core Operative Processes into a ***Digital Environment***

Ensure ***Data*** *are* ***Consistent*** *and* ***Correct***

Make ***Reliable Data*** *available to* ***Company Analists***

Reduce ***Time of Execution***

Improve overall ***Process Efficiency***

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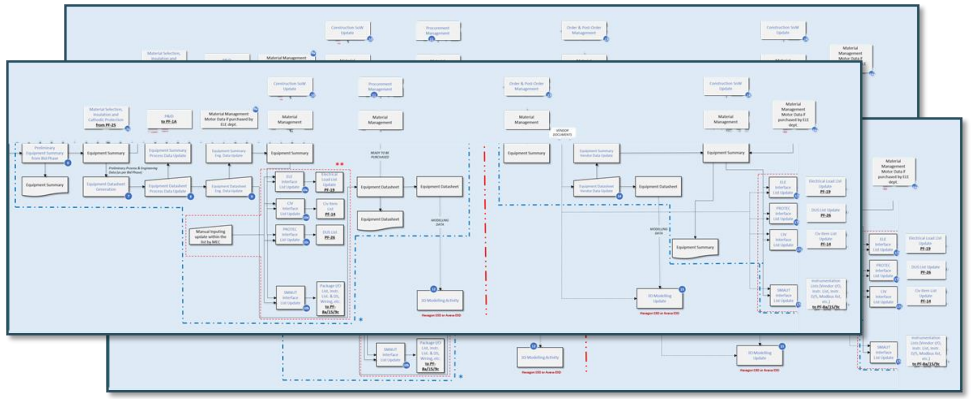
EPC DIGITAL PLATFORM

DIGITAL ENABLING PILLARS

Operative Standards and Philosophies

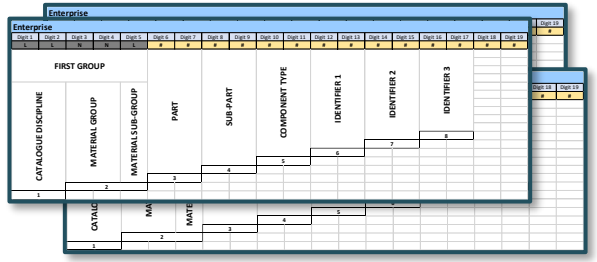
Process Data Flows

- **65** processses included
- **30** integrated tests and final tests identified



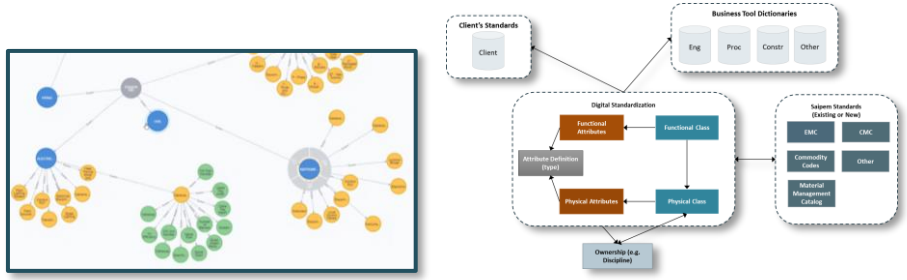
Material Coding & Catalogues

- Defined coding rules for each discipline to generate more than **750.000** catalogue items



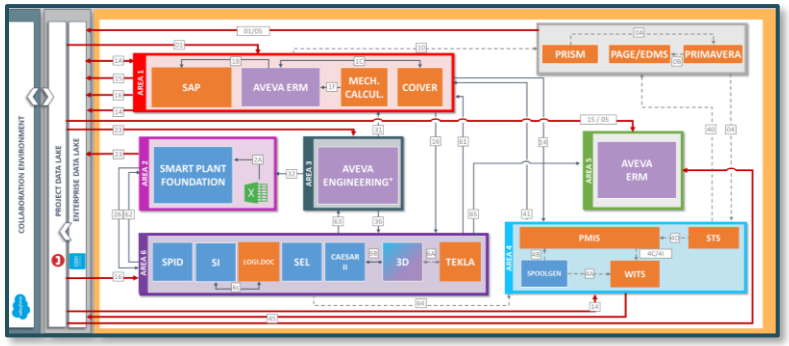
Digital Standardization & Data model

- **1000** Smart Objects
- **130.000** discipline attributes grouped in **5000** main attributes



Main Architecture & Data Flows

- Around **100** integration data flows included



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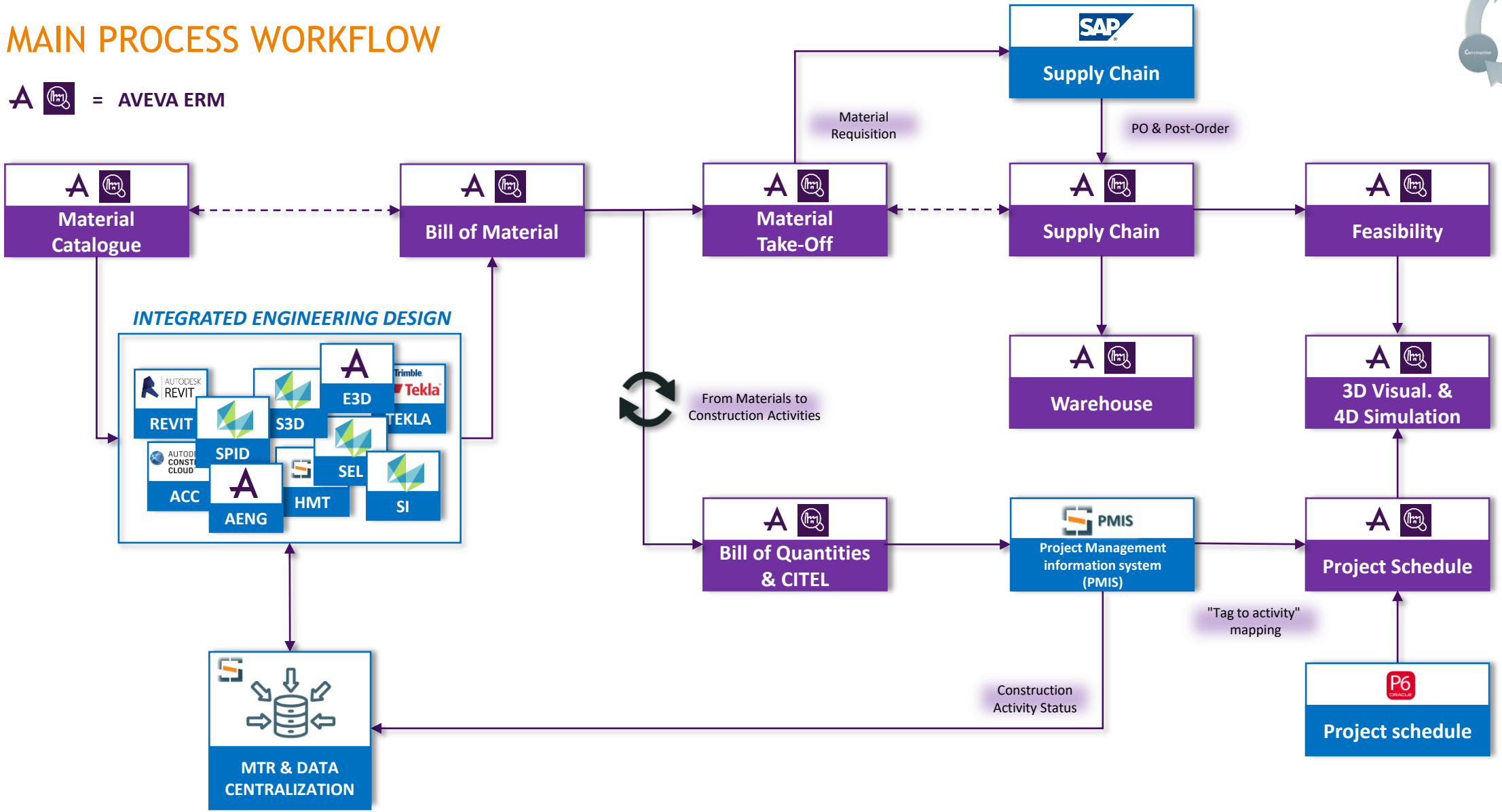
MAIN PROCESS WORKFLOW

= AVEVA ERM



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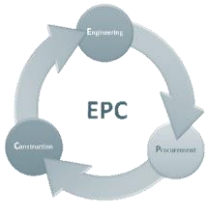
E2E MATERIAL MANAGEMENT

= AVEVA ERM



Material Catalogue

Bill of Material

Material Take-Off

Supply Chain

Material Requisition

PO & Post-Order

Supply Chain

Feasibility

Warehouse

3D Visual. & 4D Simulation

INTEGRATED ENGINEERING DESIGN

REVIT

E3D

S3D

TEKLA

SPID

SEL

ACC

AENG

HMT

SI

From Materials to Construction Activities

Bill of Quantities & CITEL

PMIS

Project Management information system (PMIS)

Project Schedule

"Tag to activity" mapping

Project schedule

Construction Activity Status

MTR & DATA CENTRALIZATION

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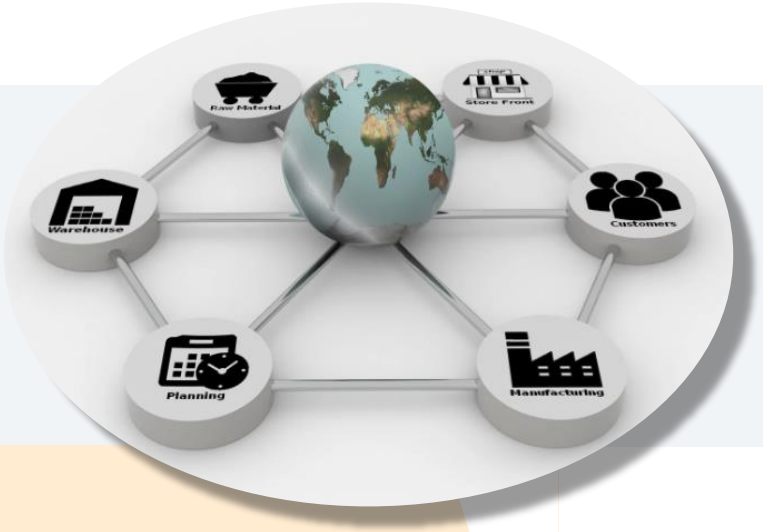
EPC DIGITAL PLATFORM

E2E MATERIAL MANAGEMENT

High Efficiency in E2E Material Management thanks to Data Traceability and Reliability improvement



Challenge

- Heterogeneous software used by different Functions (Eng./Proc./Constr.) leading to manual data sharing and reporting, leading to information bottlenecks.
  - Needed to build unique environment to be used as data repository to facilitate data collection, sharing and analysis, during the Project and across the Projects (historic data).

Solution

- Developed Material catalogues and automatic calculation method, deploying AVEVA™ ERM™ to develop streamline data collection, access, automatic analysis, and reporting.

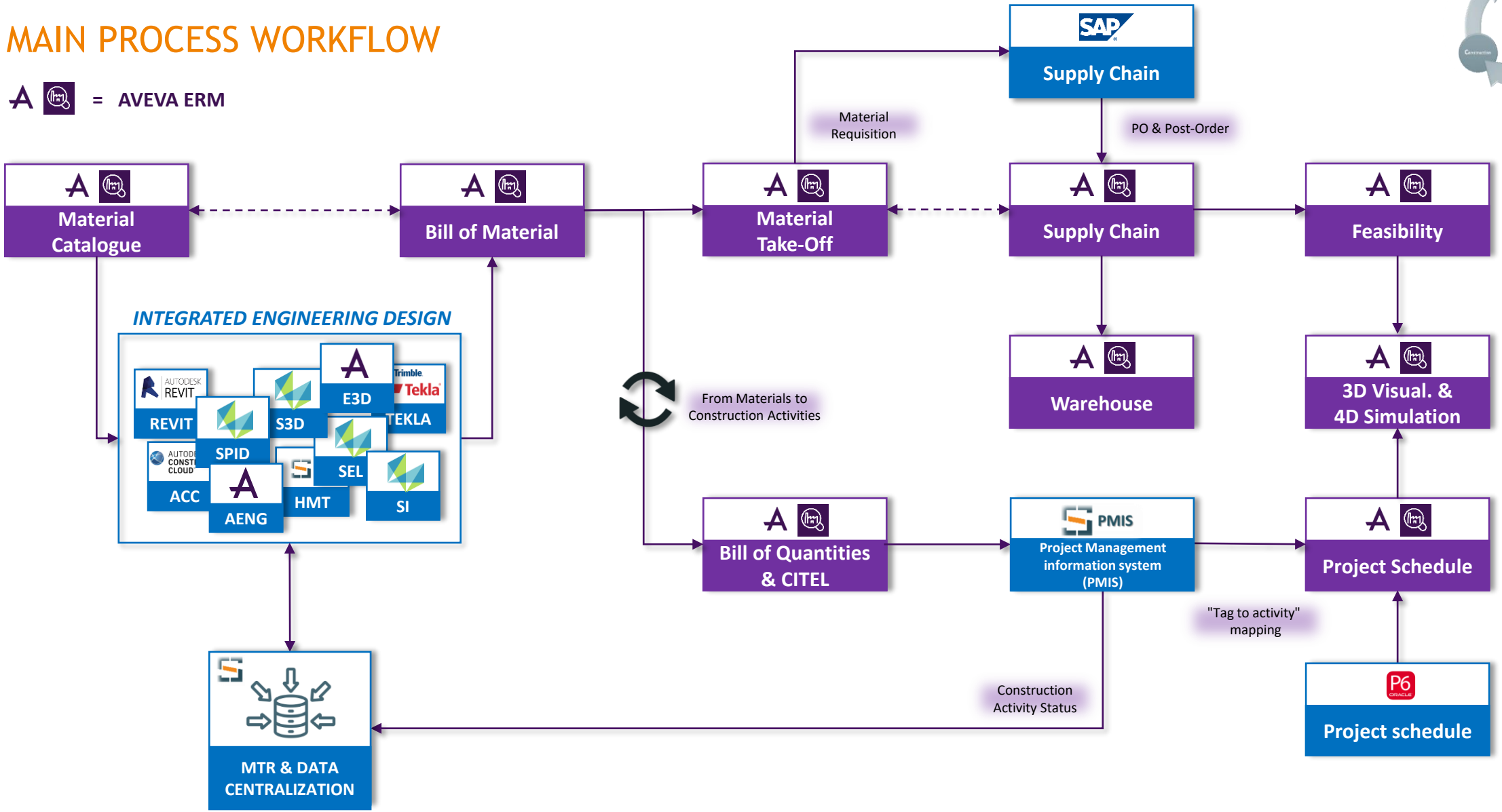
Results

- Uploaded catalogue for all Engineering Disciplines, to improve Project comparison.
- AVEVA™ ERM™ software has been successfully interfaced with Procurement (SAP) and Construction software (PMIS) eliminating any information bottlenecks and providing full E2E Material visibility.
- Increased traceability of material within the Project and across Projects at Enterprise level.
- Real time feasibility according to projects priorities (enabling what if analysis).

EPC DIGITAL PLATFORM

MAIN PROCESS WORKFLOW

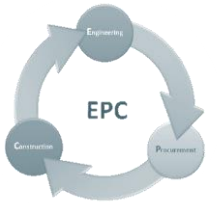
= AVEVA ERM



EPC DIGITAL PLATFORM

BoM TO BoQ TRANSFORMATION

= AVEVA ERM



Supply Chain

Material Requisition

PO & Post-Order

Material Catalogue

Bill of Material

Material Take-Off

INTEGRATED ENGINEERING DESIGN

REVIT

E3D

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HMT

SI

From Materials to Construction Activities

Bill of Quantities & CITEL

MTR & DATA CENTRALIZATION

What do we mean by "Bill of Material" (BoM)?

- *The Bill of Material (BoM) is a list of the raw materials, sub-assemblies, intermediate assemblies, sub-components, parts, and the quantities of each needed to manufacture the final product (or Plant Facilities).*

What do we mean by "Bill of Quantities" (BoQ)?

- *A Bill of Quantities (BoQ) is a document defining the quality and quantity of construction works required to be carried out to complete a project.*

What do we mean by "CITEL"?

- *The Construction Items List (CITEL) is the list of items to be installed, tested and certified during at site to reach the project completion.*

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BoM TO BoQ TRANSFORMATION

Saipem & Aveva know-how to jointly develop a New Environment for automatic BoQ Calculation

Challenge

- Manual calculation or in-houses softwares used by Engineering to generate BoQ.
  - Various degrees of complexity due to “one to multiple Bill Items” relation. E.g.: Piping shall be cut, welded, spooled, erected, painted, hydrotested, …
    - No availability of commercial software suitable for this scope.

Solution

- Developed a new environment and relevant rules within AVEVA™ ERM™ to generate automatic BoQ starting from a Bill of Material.

Results

- Common environment for all Engineering Disciplines, improving communication.
- AVEVA™ ERM ™ software has been successfully interfaced with Construction software (PMIS) eliminating bottlenecks.
- Availability of historical data within the Project and across Projects at Enterprise level.

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Thank you