

# The Multidisciplinary Engineering Collaboration Hub at ANDRITZ

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Project Manager

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Solution Architect



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# Bettina Klemke

## Project Manager Smart Service

**Bettina has been working as project manager in the global IT department at ANDRITZ AG since 2018.**

**She has 6 years experience in managing software implementation projects in the machinery and plant engineering industry. Currently she is leading the development and implementation of a global collaboration platform on engineering and project information.**





# Christian Gartner

## Solution Architect Smart Service

**Christian has been working at Andritz since 2010. He has more than 10 years experience in software development based on Autodesk products. In his current role he is responsible for the architecture within Smart Service and work closely with the various project teams.**



# Agenda



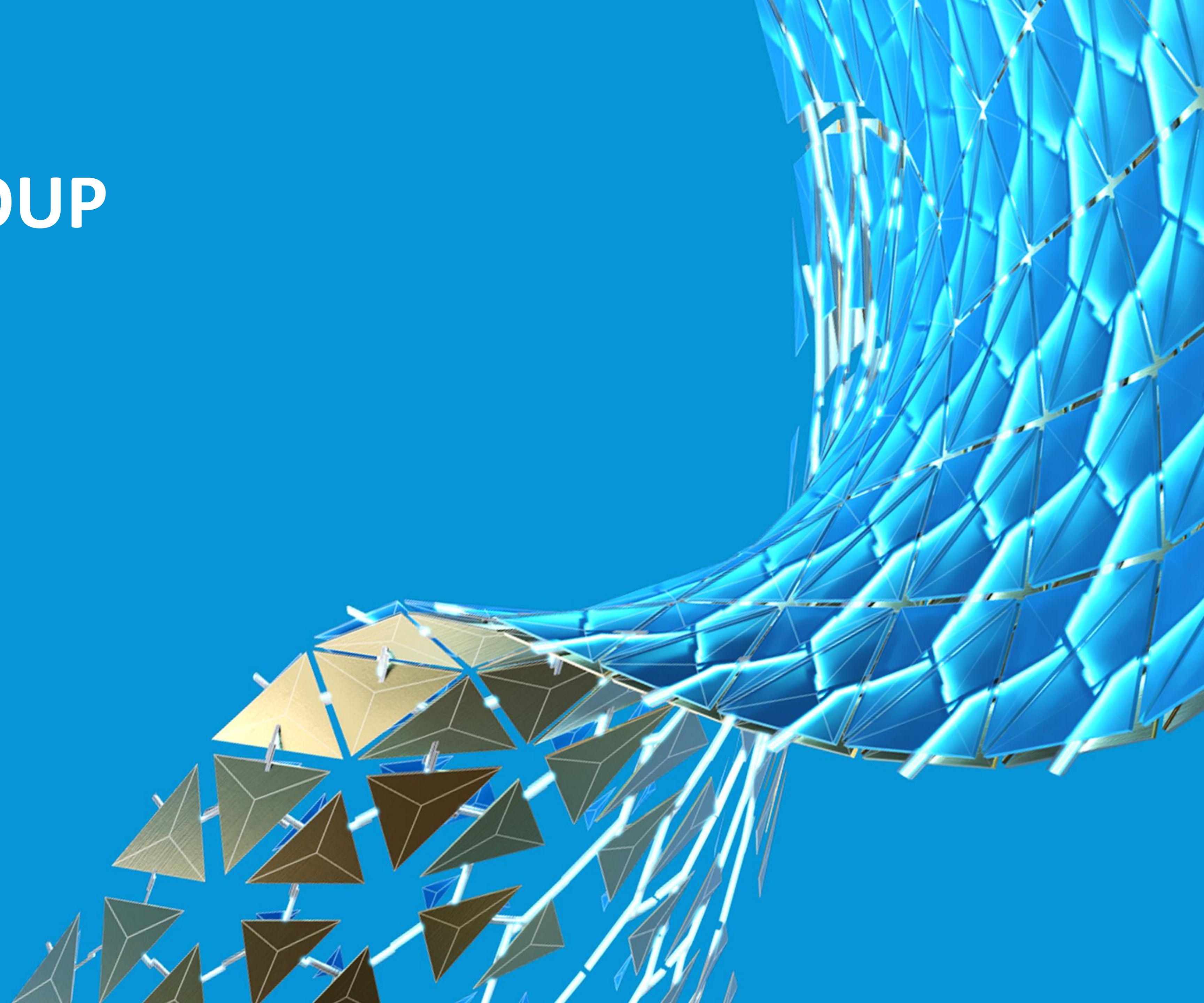


# Agenda

- ANDRITZ Group
- Metris - ANDRITZ Digital Solutions
- ANDRITZ projects and solutions
- Lessons Learned



# ANDRITZ GROUP







ANDRITZ is a globally leading supplier of plants, equipment, systems and services for the pulp and paper industry, the metalworking and steel industries, hydropower stations, pumps, and solid/liquid separation in the municipal and industrial sectors as well as for animal feed and biomass pelleting

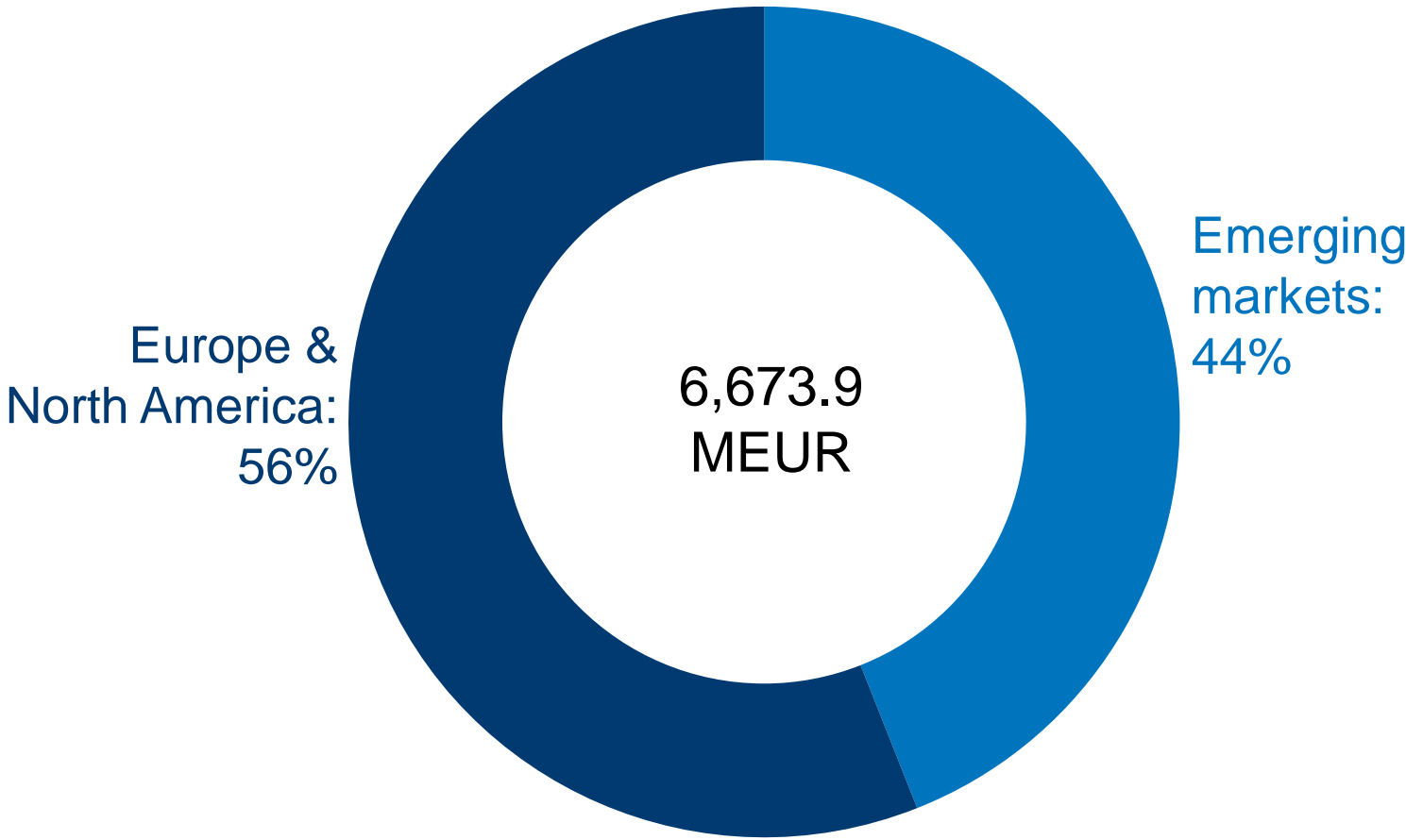
## Global presence

Headquarters in Graz, Austria; over 280 production sites and service/sales companies worldwide

### KEY FINANCIAL FIGURES:

	UNIT	H1 2020	2019
Order intake	MEUR	3,036.7	7,282.0
Order backlog (as of end of period)	MEUR	7,396.6	7,777.6
Sales	MEUR	3,173.0	6,673.9
Net income (including non-controlling interests)	MEUR	83.3	122.8
Employees (as of end of period; without apprentices)	-	27,828	29,513

SALES BY REGION 2019 (%)





# A WORLD MARKET LEADER WITH FOUR BUSINESS AREAS



## PULP & PAPER



% order intake\*

### PRODUCT OFFERING

Equipment for production of all types of pulp, paper, tissue, and board; energy boilers

## METALS



% order intake\*

### PRODUCT OFFERING

Presses/press lines for metal forming (Schuler); systems for production of stainless steel, carbon steel, and non-ferrous metal strip; industrial furnace plants

## HYDRO



% order intake\*

### PRODUCT OFFERING

Electromechanical equipment for hydropower plants (turbines, generators); pumps; turbo generators

## SEPARATION



% order intake\*

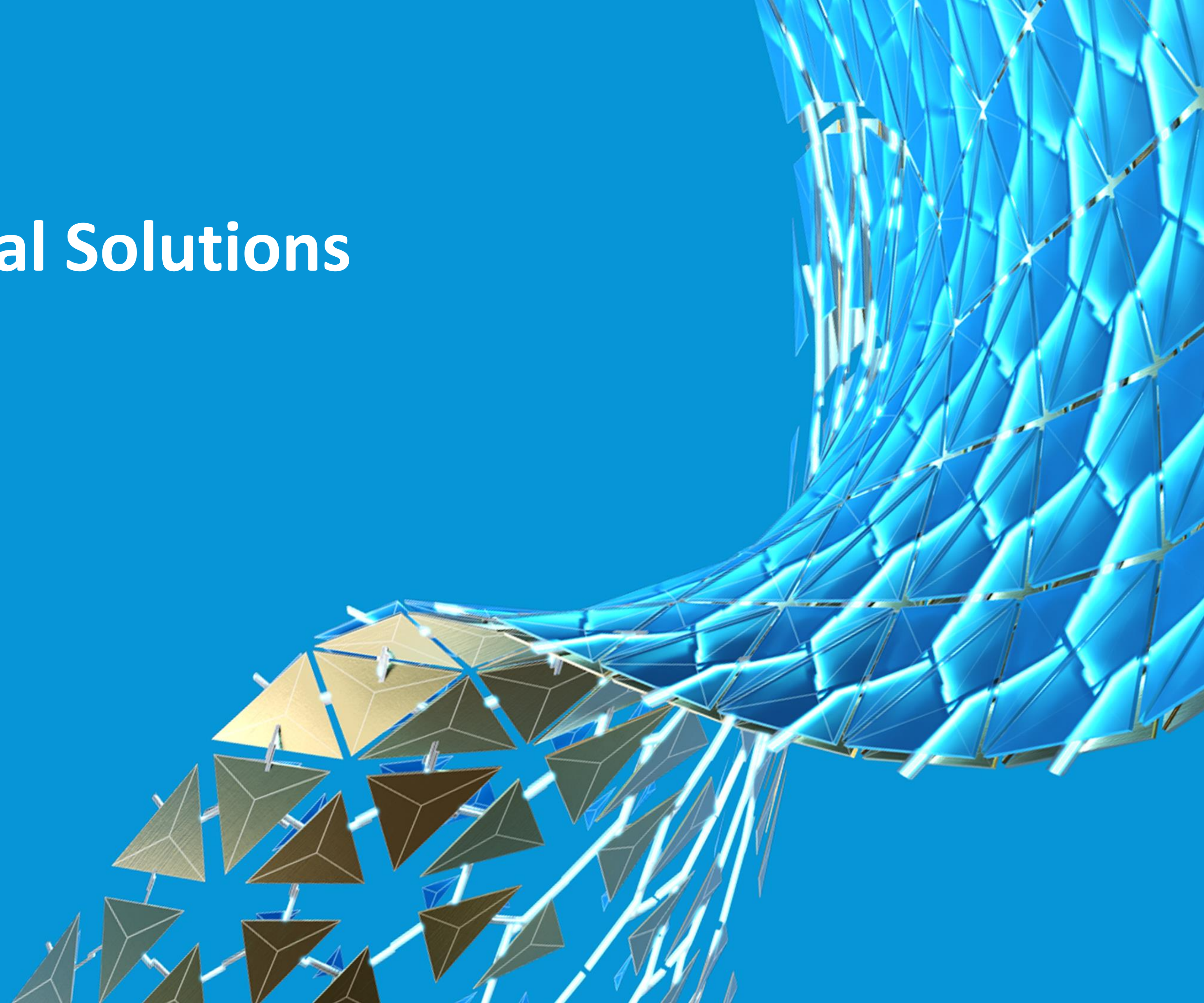
### PRODUCT OFFERING

Equipment for solid/liquid separation for municipalities and various industries; equipment for production of animal feed and biomass pellets

\* Share of total Group order intake 2019



# Metris ANDRITZ Digital Solutions





# BROAD PRODUCT OFFERINGS IN DIGITALIZATION



With the **technology brand Metris**, ANDRITZ offers a broad portfolio of intelligent, digital solutions and products.

Metris technologies are tailored to the customer needs and optimize industrial procedures and processes.



# METRIS DIGITALIZATION LANDSCAPE





# METRIS SMART SERVICE

**Metris Smart Service** enables digital solutions to support various business processes by increasing the efficiency and benefit along the lifecycles in a digital way. Target is to exploit and explore convenient digital tools for our business areas and finally end-customers. The **connected, intelligent software solutions** support, simplify and optimize – internal and external – workflows and communication.



Engineering-Construction-Service Platform



Metris Spare Parts Catalog



Metris Digital Plant Documentation



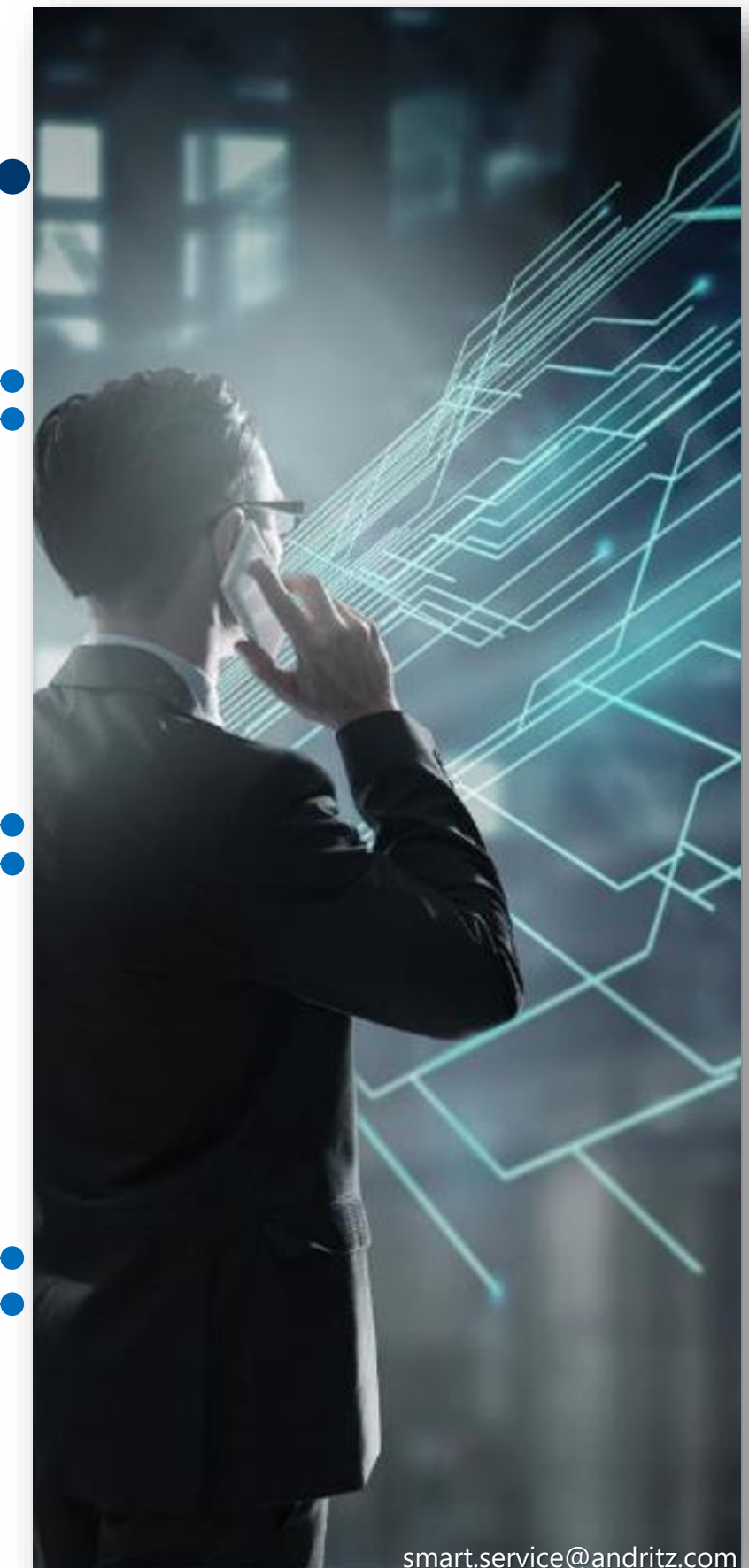
Metris Remote Assistance



Field Service Management

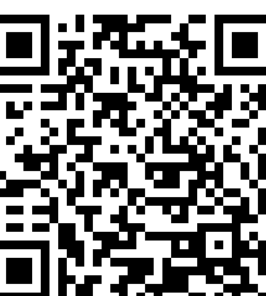


Metris Customer Care Portal



smart.service@andritz.com

Come and visit us!





# ECS PLATFORM

Engineering -

Construction -

Service



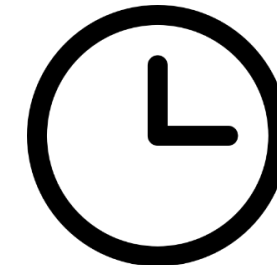


# INITIAL SITUATION & TARGETS



**Search** for latest engineering documents and data **is time consuming** for the whole value chain

**High effort** for Service in collecting **as-built information**

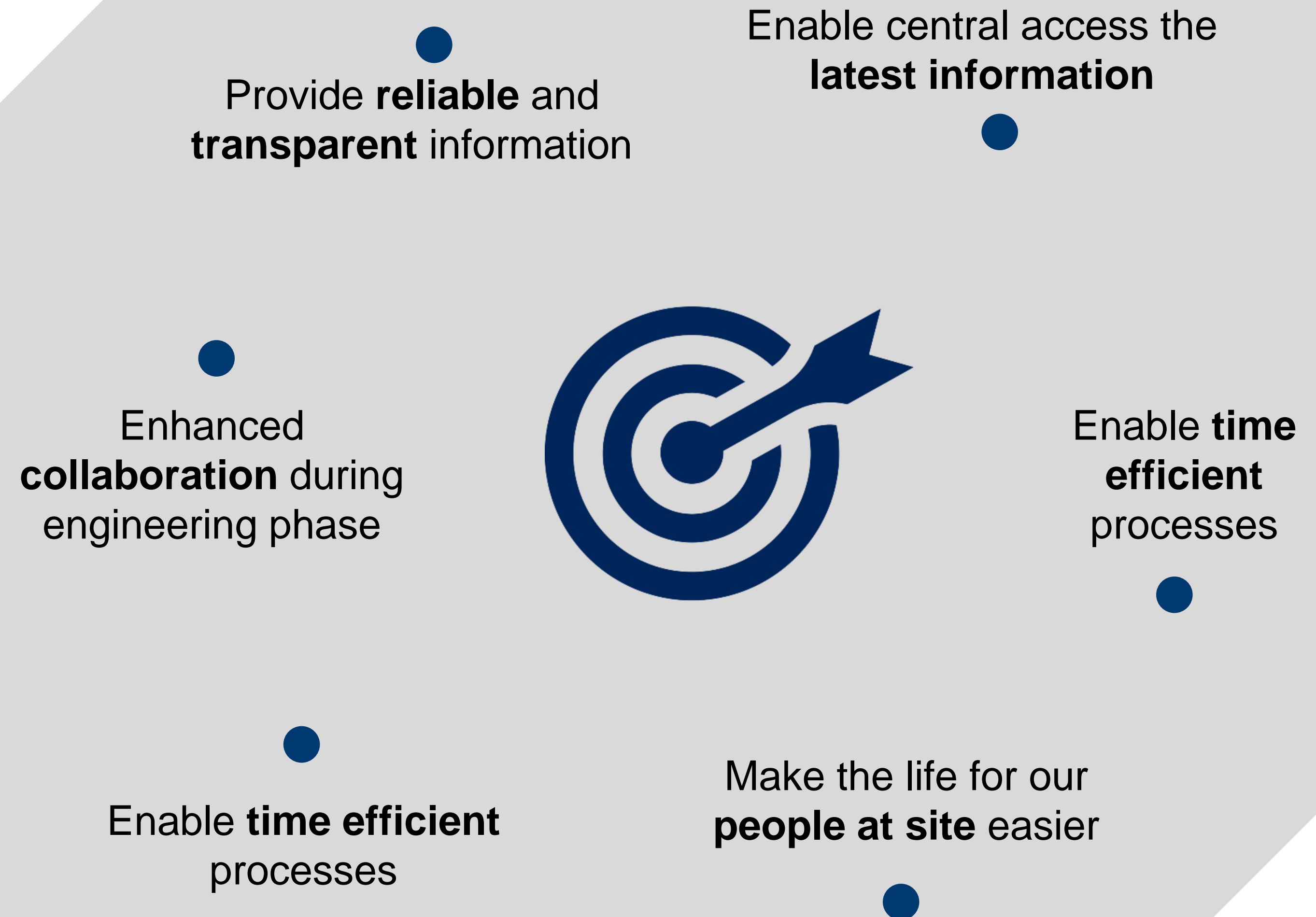


**No full transparency** of design change process

Back-offices do **not get the info** they need to receive



**Missing link** between construction site and back-office





# ECS PLATFORM PROJECT VISION



We provide **one integrated platform** for seamless end-to-end processes

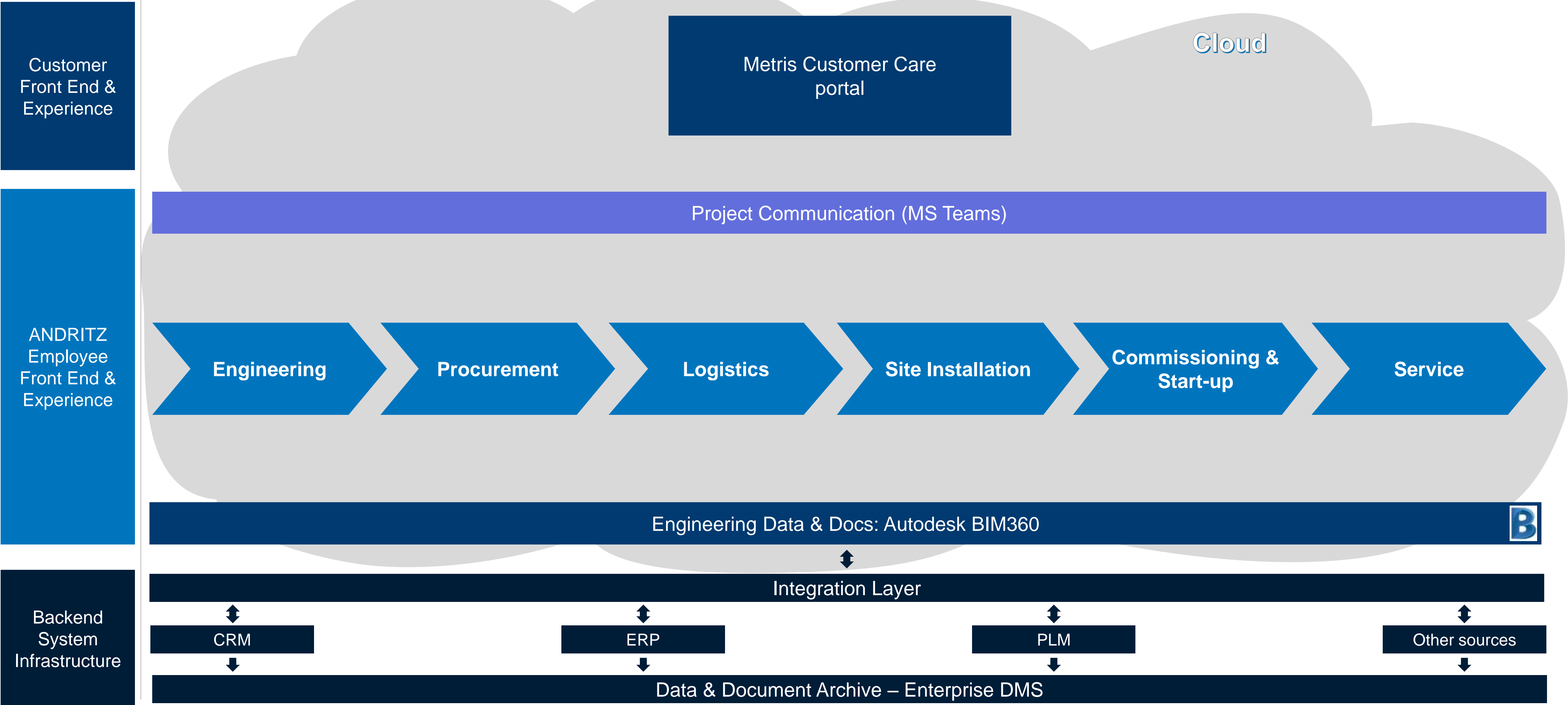


We **digitalize** our **project lifecycle** to have **reliable, transparent information** at our fingertips, to enable **better cost, quality, and time efficient processes** for our ANDRITZ ecosystem.





# PULP&PAPER DIGITALIZATION – TARGET ARCHITECTURE





# ENGINEERING-CONSTRUCTION-SERVICE PLATFORM REQUIREMENTS



Engineering

Procurement

Logistics

Site Installation

Commissioning &  
Start-up

Service

## HANDLING OF DEVIATIONS

- Recording of any deviations (e.g. RFIs)
- Creation of NCRs & FWOs
- Cost controlling
- Solid data base for claims

## MOBILITY

- Access latest engineering documentation on a mobile device
- Offline access to engineering data

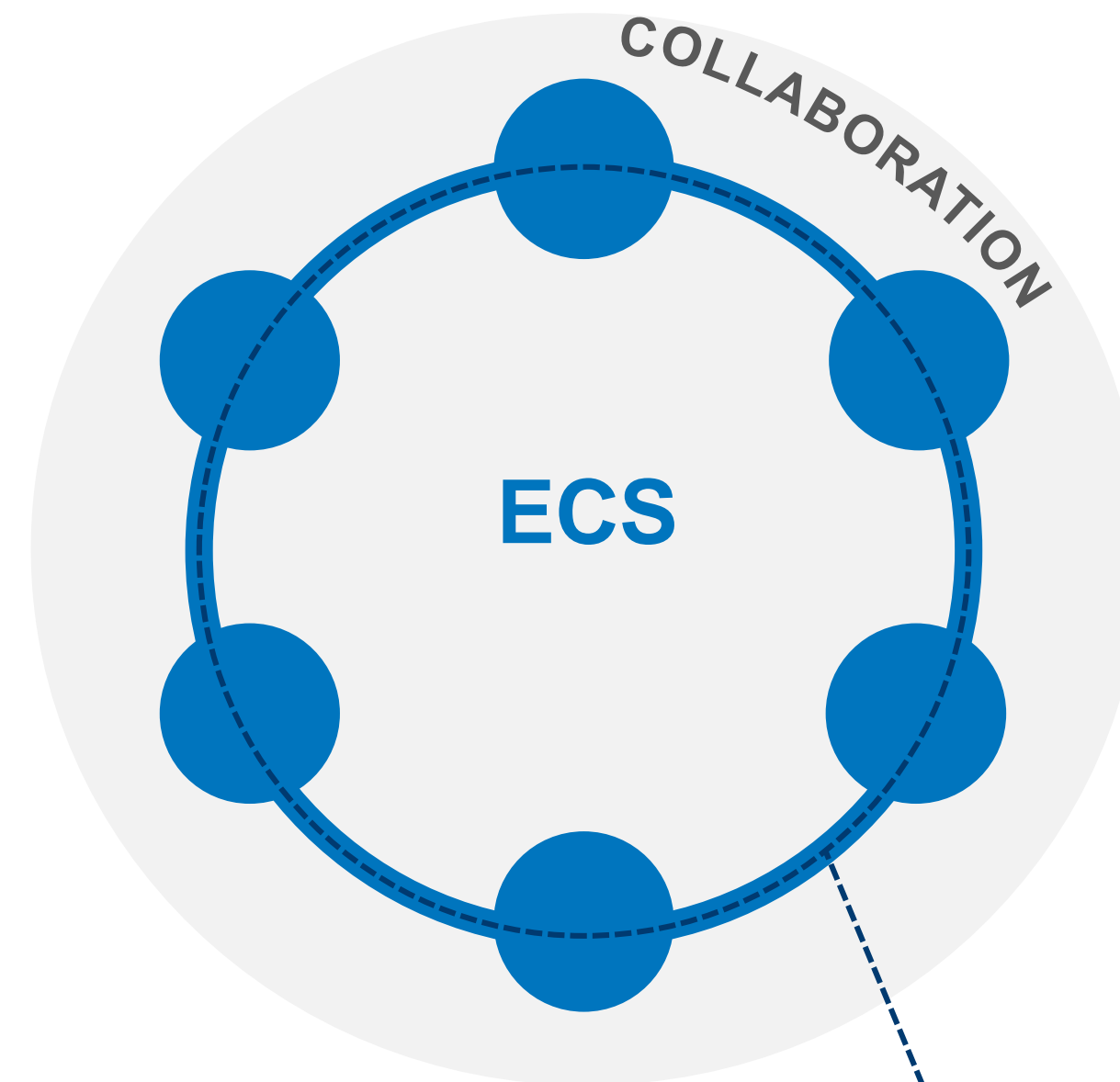
## GET BIM READY

- Digital twin
- Legal requirements
- Way to only extract relevant information

## DATA & DOCUMENT MANAGEMENT

- Fast and reliable access to latest data and documents relevant
  - Status info along the value chain
- One source of truth
- Sustainable & searchable storage of information
- Management of documents generated at engineering phase
  - Access to archived projects
  - Access to past documentation

Project Data & Document Management Layer



## SITE REPORTING

- Daily logs
- Summary reports
- Inspections
- Site project dashboard

## HEALTH, SAFETY AND ENVIRONMENT

- Accident/Incident Reports
- HSE Statistics
- HSE Audits

## COLLABORATION

- Share information with defined persons
- Integrated communication cycles linked to objects
- Red-lining/markups/comments
- Alerts on documentation changes
- Collaboration with external engineering



# PROJECT TIMELINE



## REQUIREMENTS DEF. AND TOOL EVALUATION

- June 2020

The platform concept has been defined based on business requirements along the value chain with focus on:

- Engineering
- Site Installation

## PILOT

July – December 2020

Five BIM360 pilots are currently in progress globally at Pulp&Paper with focus on:

- Engineering collaboration
- Design deviation process at site

today



## IMPLEMENTATION OF PILOT SCOPE

2021

The functionalities that have been part of the pilots will further be adapted and implemented.

## SCOPE EXPANSION

2021 onwards

Additional functionalities of BIM360 would be evaluated against ANDRITZ Pulp&Paper requirements, piloted and implemented.



# MAIN BIM360 PILOT PROJECT

## FACTS



### ANDRITZ project

- New **brownfield pulp line in South America**
- ANDRITZ will provide **four** of the six most **important process islands** in the pulp mill
- Scope of supply on EPCC (Engineering, Procurement, Construction and Civil Construction) basis
- Latest designs in a “new generation pulp mill” to incorporate a bio-refinery concept for energy-efficient and environmentally friendly pulp production
- Currently in **installation phase**; Start up scheduled for 2021

### BIM360 pilot

- September – December 2020
- **One process island**
- Currently about **30 users**
- More than **7000 documents**
- Site: Management and Supervisors
- Engineering: Project Engineering Management, Product Management, Engineers



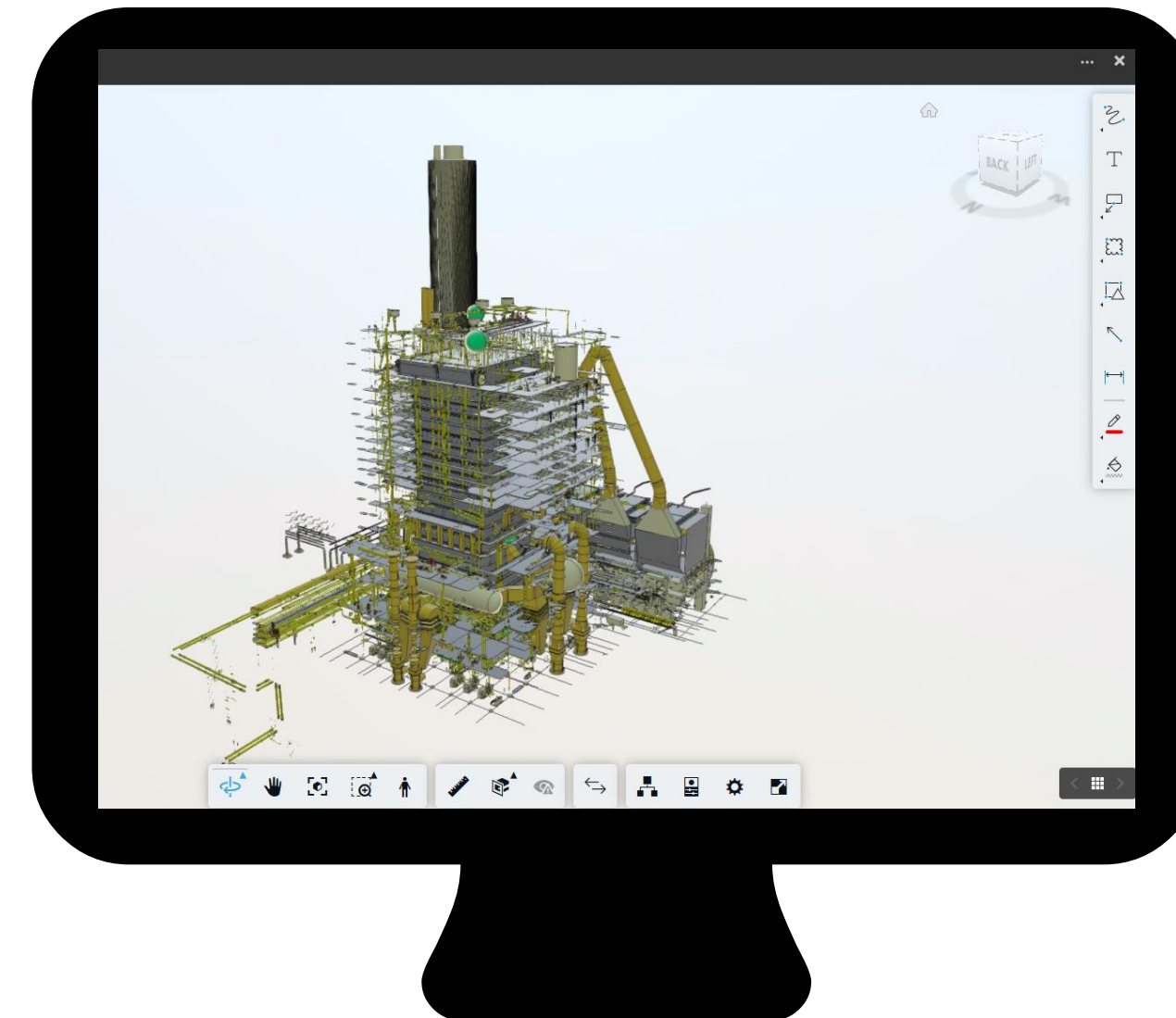
# BIM360 PILOT SCOPE



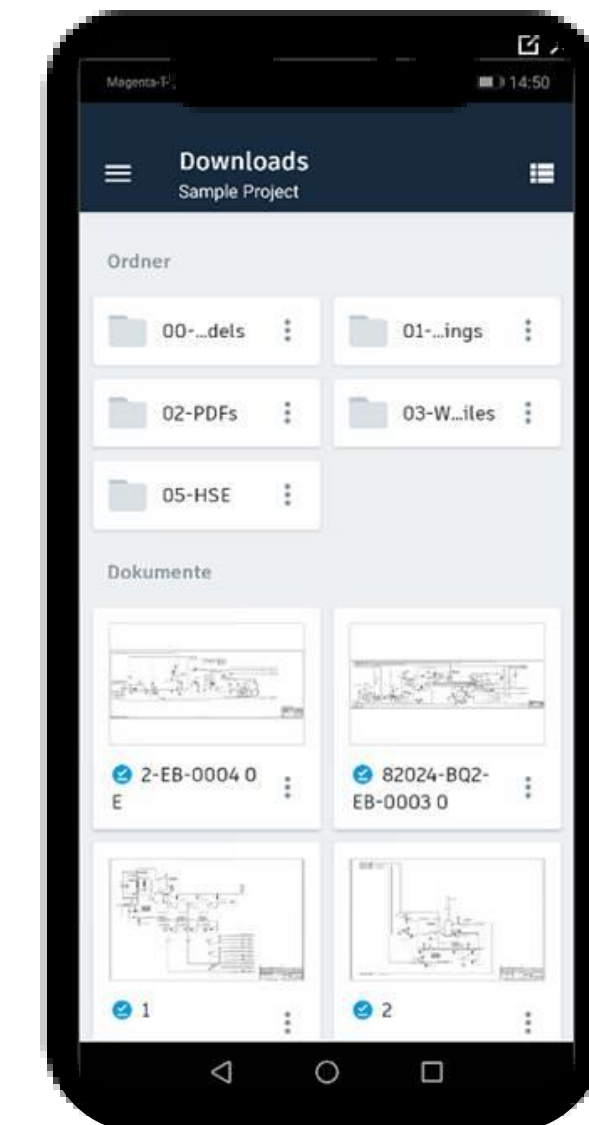
September – December 2020



Perform **red-lining** on engineering documents, create **design deviations** and perform workflow to responsible engineers.



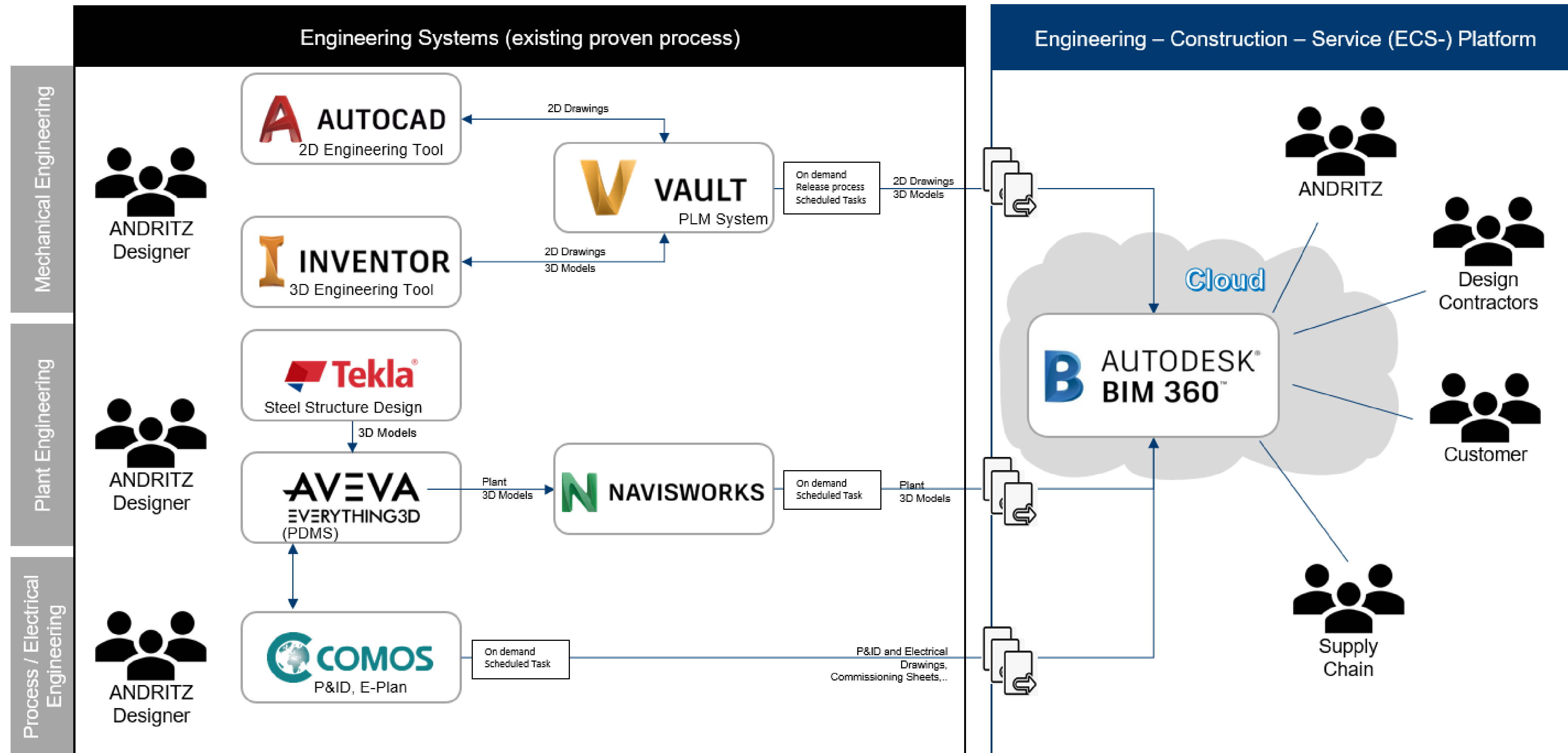
Easy and **central access** to relevant engineering documents.



Functionalities are tested on **mobile devices and offline**.



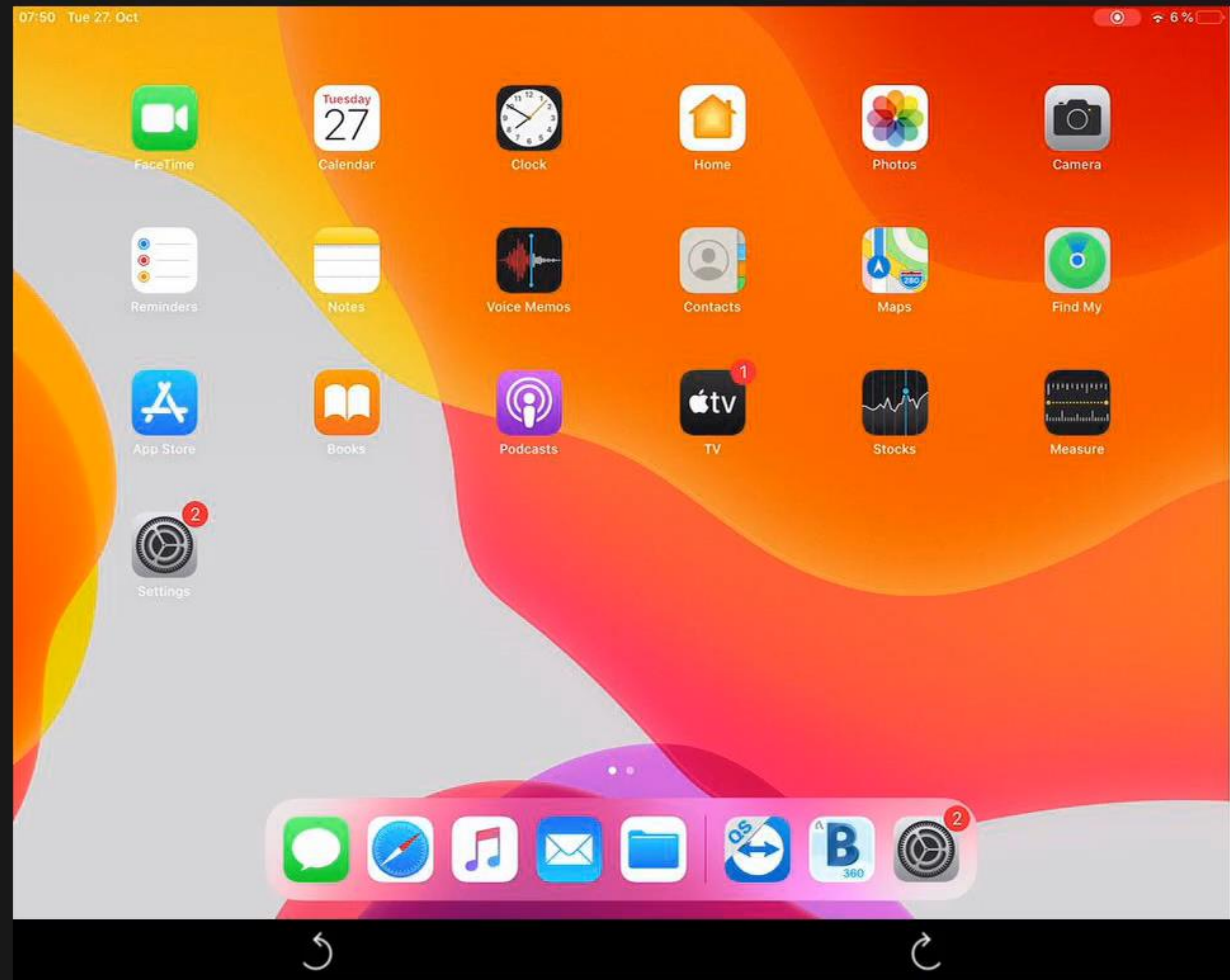
# INTEGRATION OF ENGINEERING DATA AND DOCUMENTS TO THE BIM360 PLATFORM













Document Management

FOLDERS

REVIEWS

TRANSMITTALS

ISSUES

⌵

Search

Filtering is on

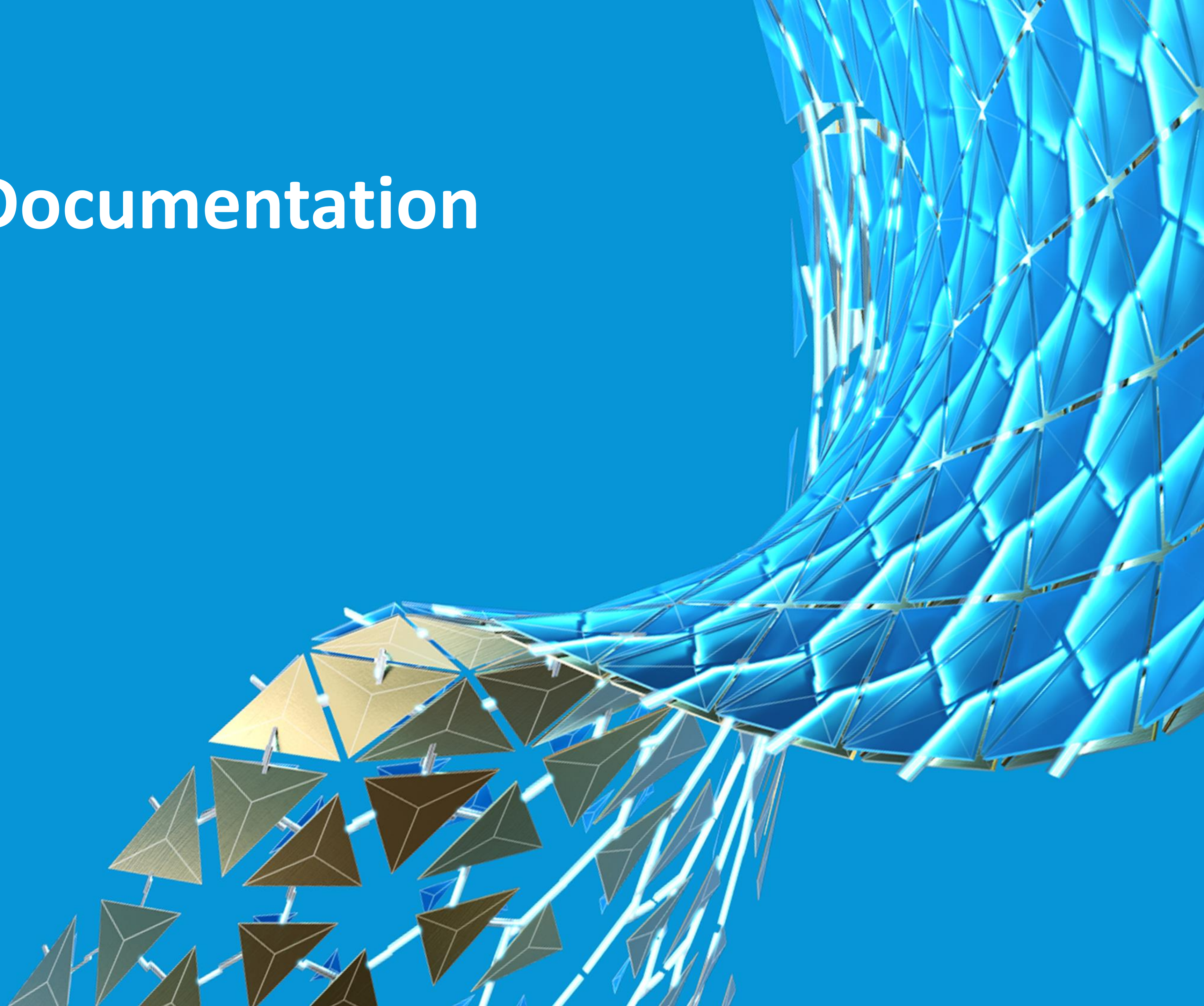
Export

Create Issue

ID	Type	Sub-type	Title	Location	Assigned to	Company	Due date	Linked document			
15	Design	Design	2 holes are missing	111_Furnace Up...	Christian Gartner (outlook)	Andritz AG	Nov 26, 2020	STEEL PA...0.dwg	0	0	
14	Design	Client Feedback	test issue type	-	Antonio Bosnjak	Andritz AG	-	-	0	0	
13	Design	Client Feedback	new process workflow t...	-	Patrick Rodziewicz	Andritz AG	Oct 17, 2020	-	0	2	
12	Design	Design	Potential design change	-	Patrick Rodziewicz	Andritz AG	Oct 6, 2020	Not Available	0	0	
11	Design	Design	Potential design deviati...	102_Water Drum	Patrick Rodziewicz	Andritz AG	Oct 9, 2020	-	0	1	
9	Design	Design	[Describe the issue in s...	-	Antonio Bosnjak	Andritz AG	-	Not Available	1	2	
7	Design	Design	Potential design change	102_Water Drum	Patrick Rodziewicz	Andritz AG	Sep 28, 2020	-	0	3	
6	Design	Design	UpdateDrawingNotifica...	-	Antonio Bosnjak	Andritz AG	-	Not Available	0	0	
5	Design	Design	Needs redesign	204_Boiler han...	Antonio Bosnjak	Andritz AG	Sep 23, 2020	Not Available	1	1	



# Digital Plant Documentation





# METRIS DIGITAL PLANT DOCUMENTATION

## Product Vision

- **Linking 3D and 2D engineering data**

Enabled the link between objects/parts in 3D and 2D – visualizing their connections and interoperability

- **Central access to all relevant engineering metadata**

All relevant metadata and object properties available with a button click

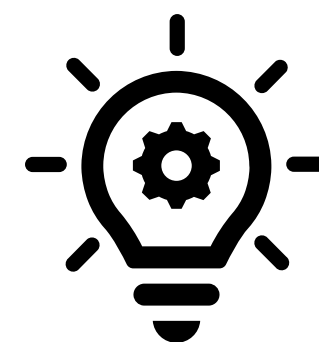
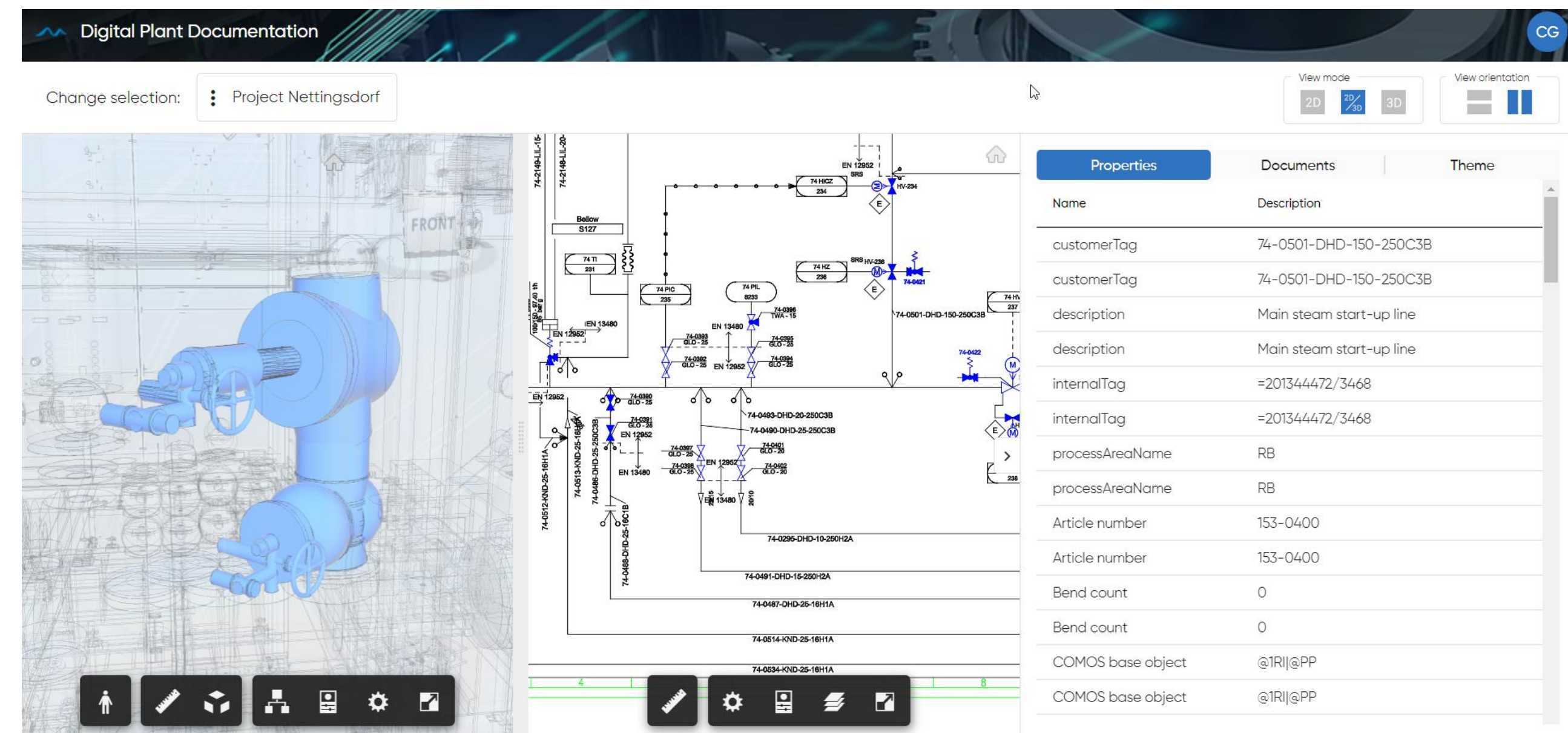
- **Color coded views**

Filtering by specific object properties visualizes and focuses the model with color codes

- **Documentation linkage to DMS - system**

Linkage with relevant documentation from DMS system on a granular (object/part) level

Provide a **digital version of a plant** with all relevant information connected within **one application**



## Usage scenarios

- as ANDRITZ branded **digital twin** for engineering documents
- as **final-customer documentation** instead of paper folders
- connect with **machine performance data**....

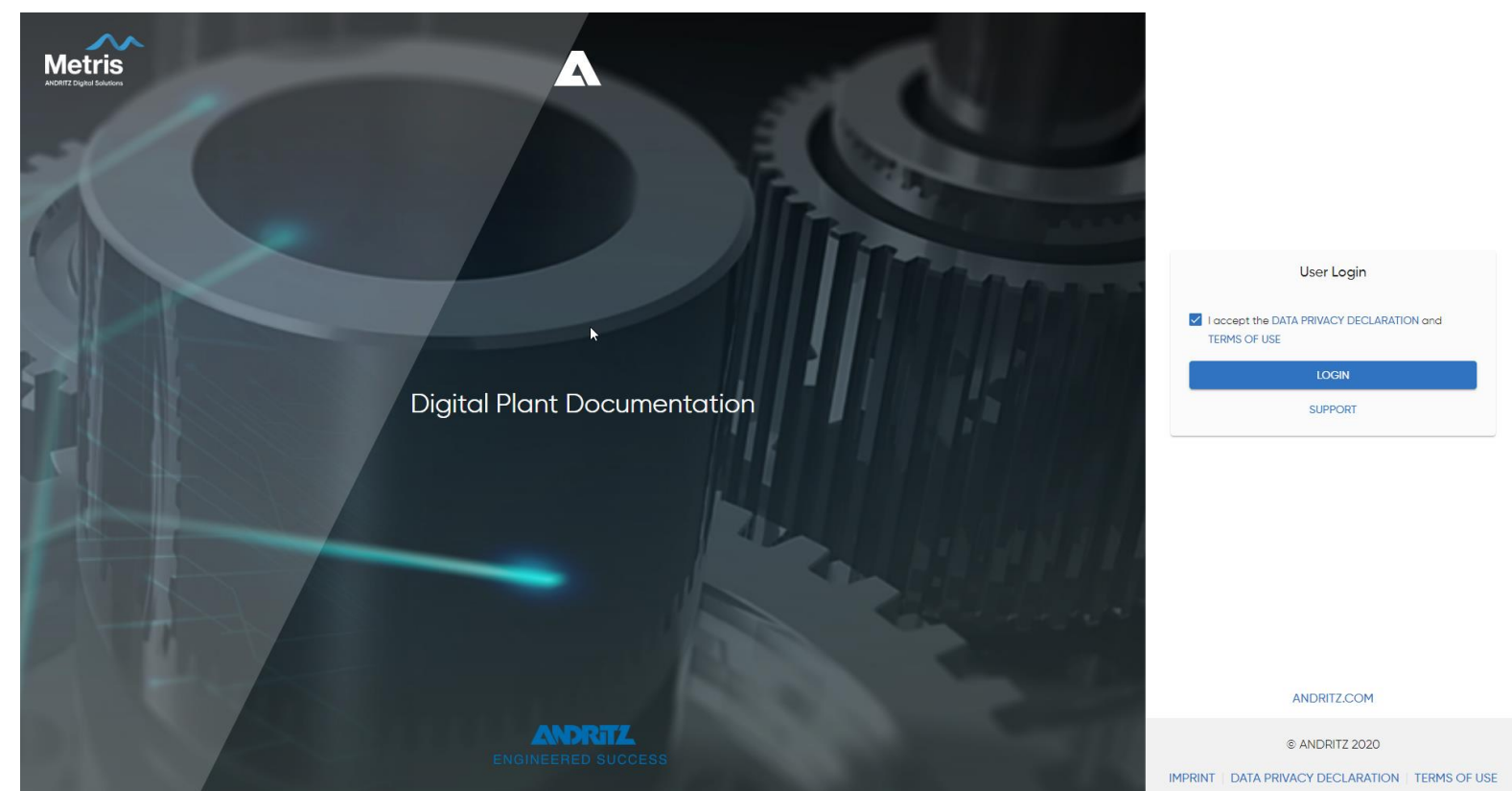


digitalplant.andritz.com

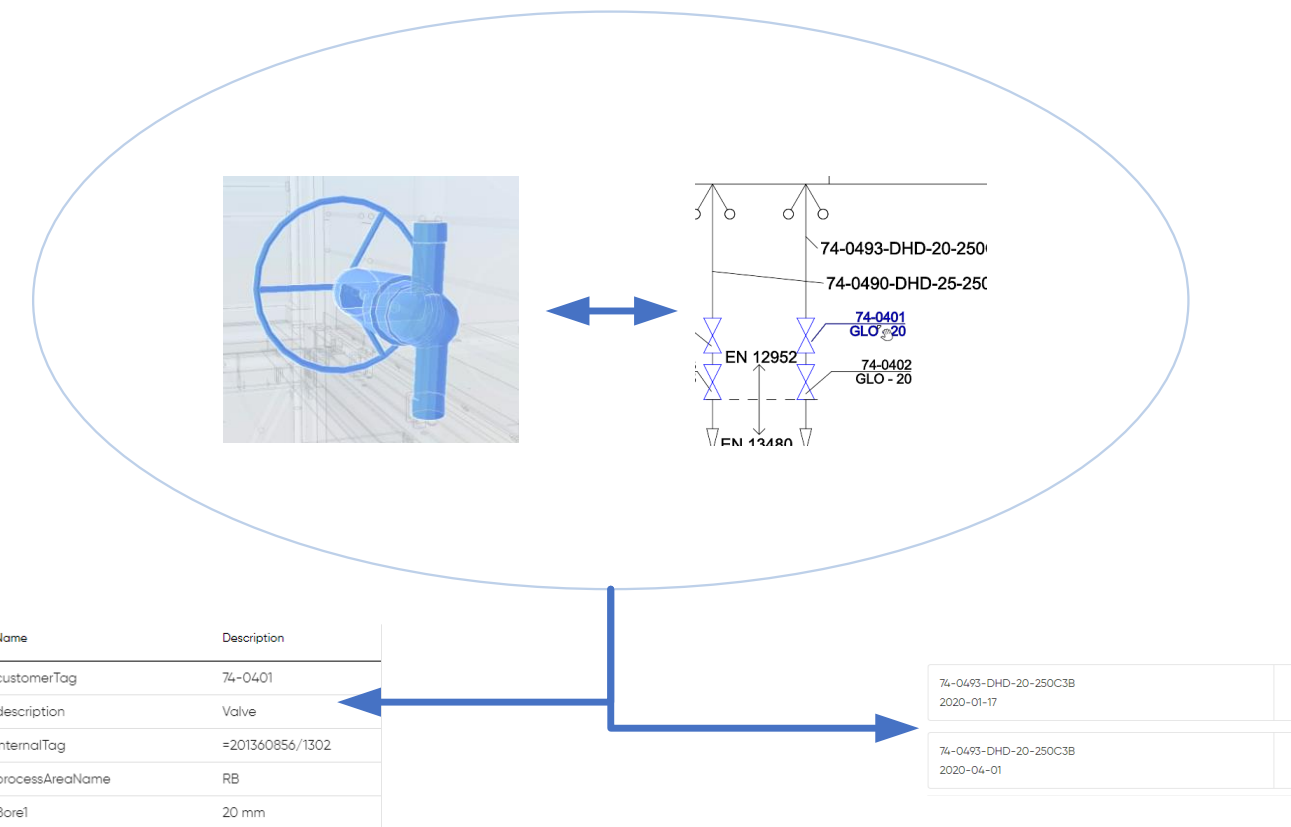


# WHY AN OWN APPLICATION

## ANDRITZ corporate branding



## Extend BIM360 functionality

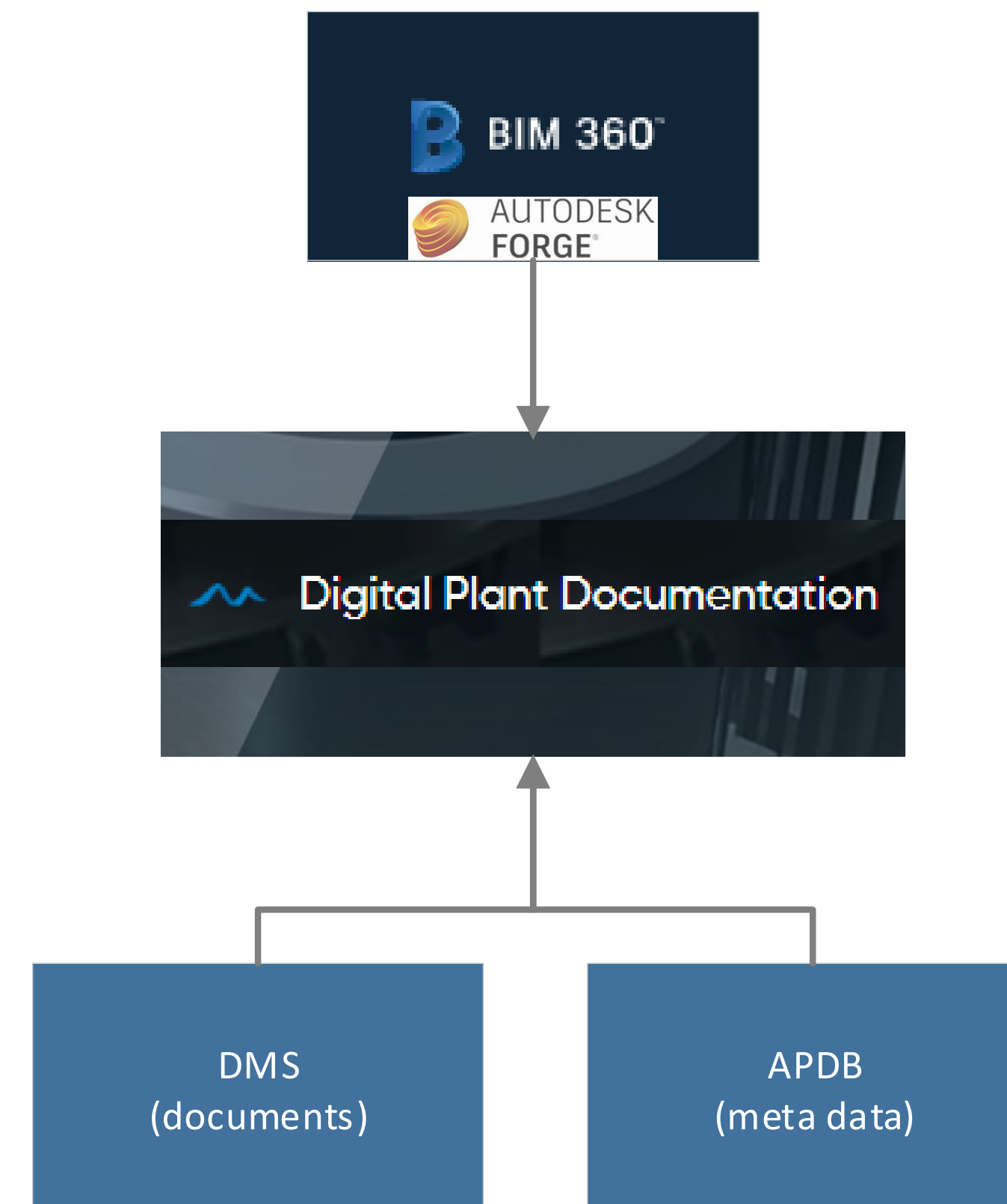


- Linking of 2D & 3D on object level in a single view
- Integration of other data sources (meta data, IoT)
- Theming: Apply color coded views on the 3d model



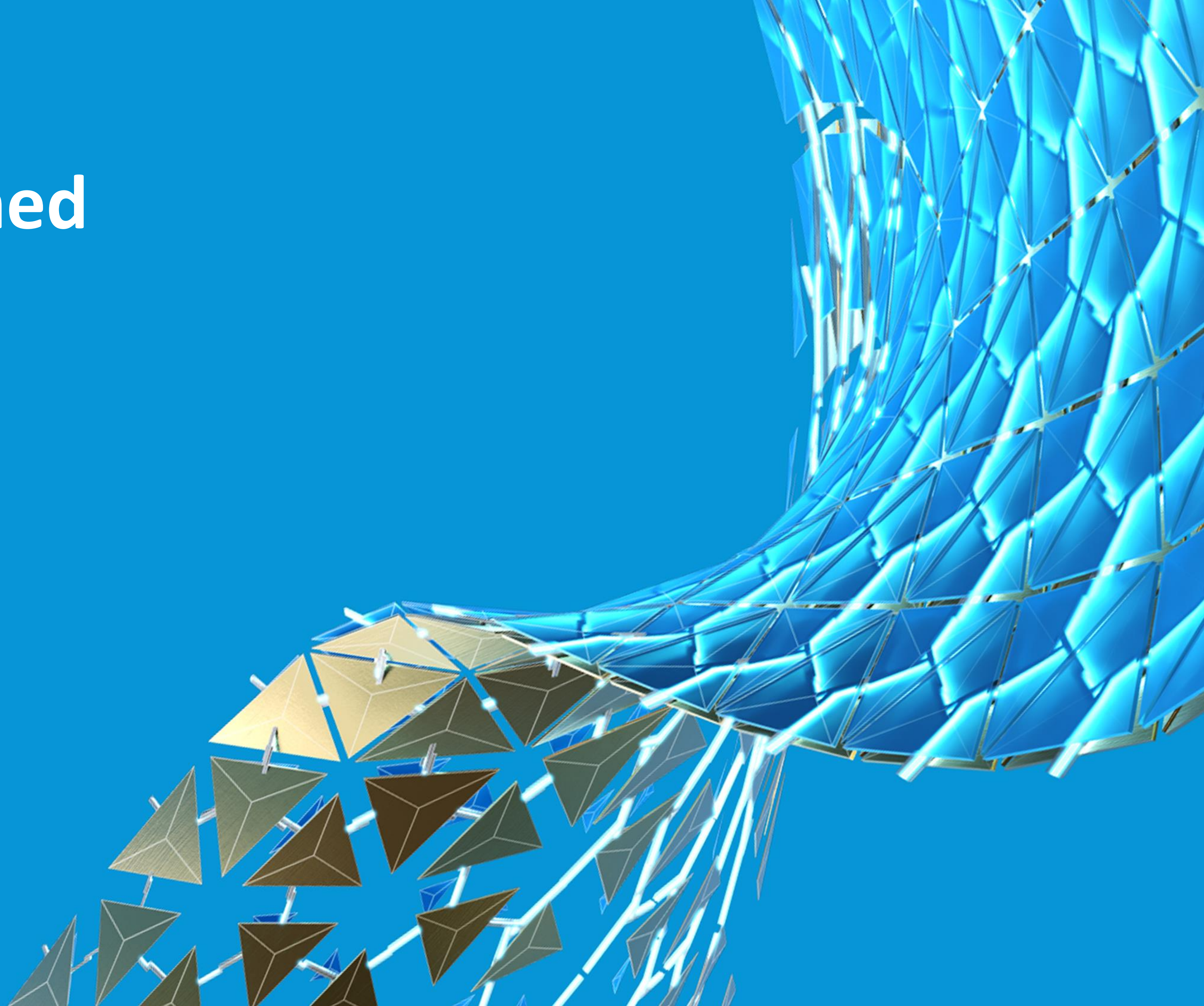
# SOLUTION ARCHITECTURE

- Digital Plant app
  - Custom developed web app.
  - Stack: Angular / Node.
- BIM360
  - Storage of all engineering documents.
  - User & permission management.
- APDB
  - Contains all relevant meta data & document links.
- DMS
  - Enterprise document mgmt system.





# Lessons Learned

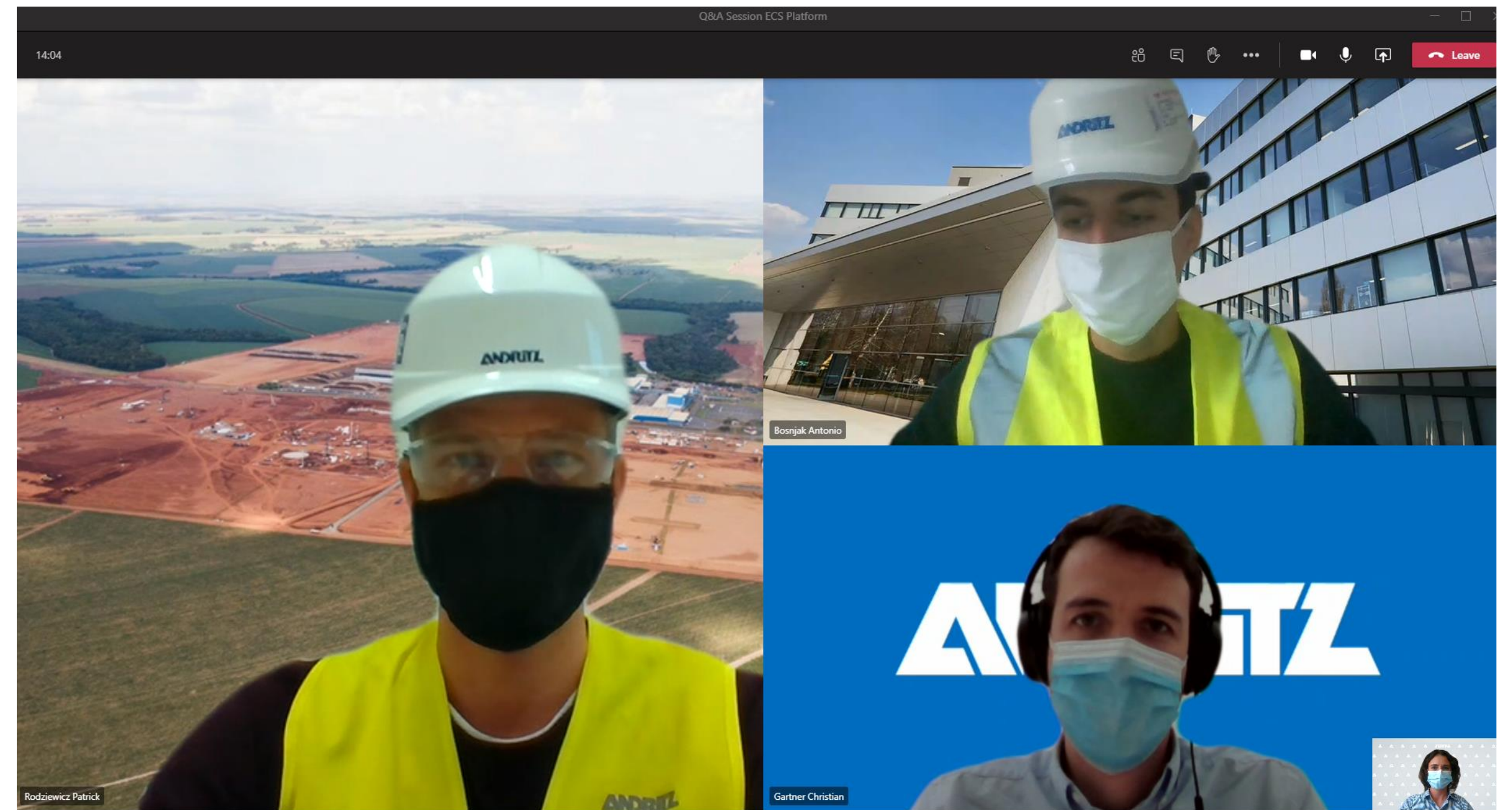




# Close collaboration with end users

## Basis for success

- On boarding sessions with the users
- Trainings
- Weekly Q&A sessions
- Weekly alignment meeting with the site

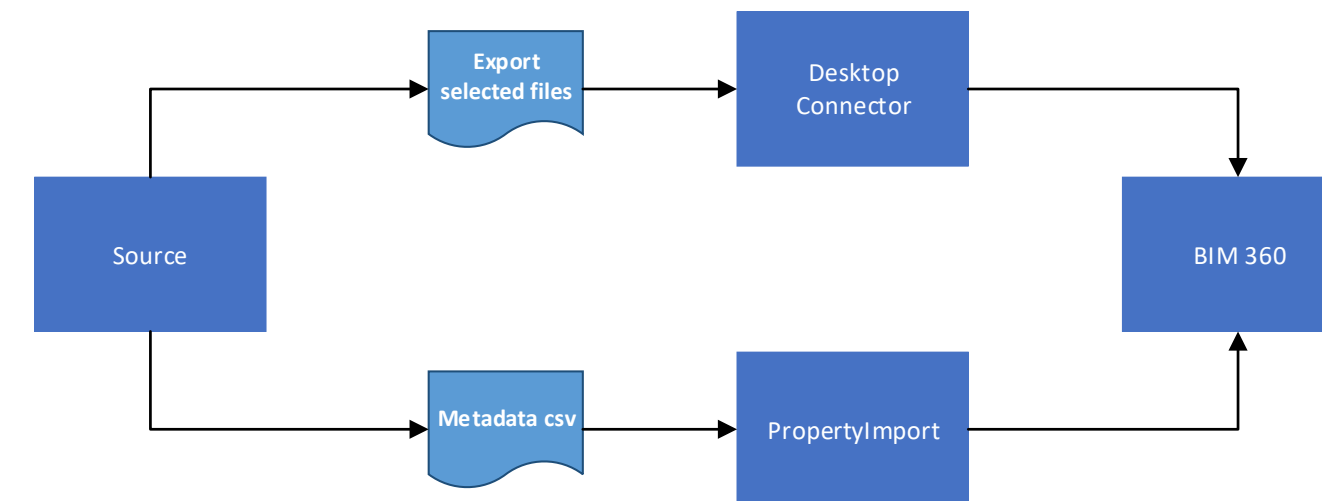




# Data management

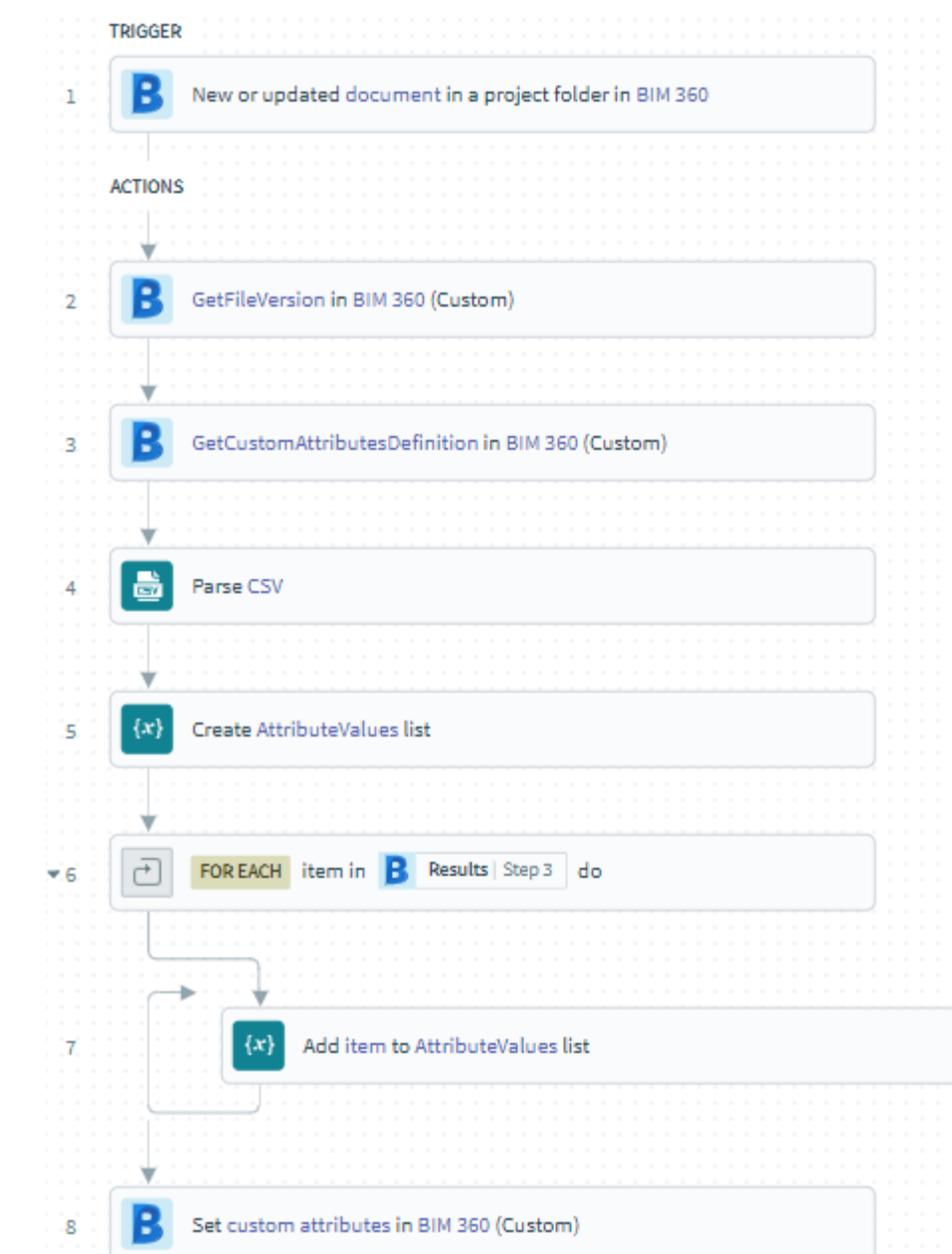
## Handling of data from different source systems

- Import files
- Import meta data



## Folders & permissions

- Avoid too many nested folders
- Assign permissions to roles instead of users directly.
- Don't allow users to edit files which are automatically uploaded.





# Process definition

- There are mainly **2 ways** for the definition of the digitally supported process:
  - Define the whole workflow and process first, then start.
  - Start with **basic process** and perform **continuous adaption**s. → this is OUR WAY
- Define **streamlined processes** as much as possible so that they fit for all stakeholders (e.g. site installation and service)
- Implement requirements of **daily tasks first**
- Define when **which system** should be used for **which purpose** (PDM/PLM <-> BIM 360 <-> Enterprise DMS)



# Expected Benefits

- Time saved in **searching** for documents during the project lifecycle
- **Early prevention** of potential, **costly errors** by having real time project information easily accessible for stakeholder along the value chain
- Enhanced **collaboration** and reduced information transfer effort (ANDRITZ, supplier, customer)
- **No engineering or installation errors** due to not having the latest version available
- Workflow based **deviation process** increases efficiency and transparency
- Efficient and increased **collaboration** between construction **site** and **engineering**
- Increased **transparency** on project status and progress





**THANK YOU FOR YOUR  
ATTENTION!**

**BETTINA KLEMKE**

**CHRISTIAN GARTNER**





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