

Empowering Forge with Power BI

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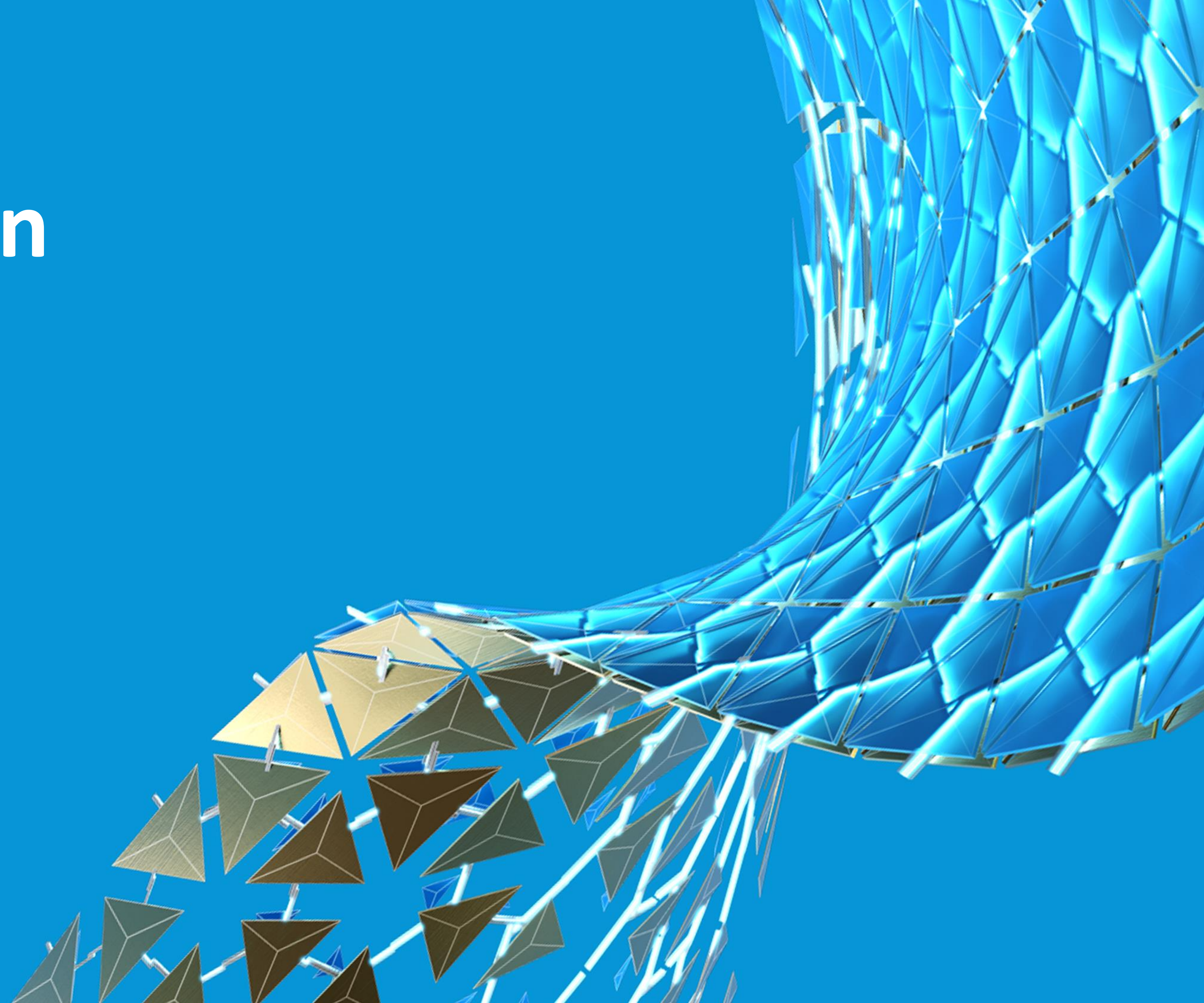
Overview

05

FUTURE

What's next

Introduction



Learning Objectives

FORGE PLATFORM

- Discover how Forge brings data to the center

DATA-CENTRIC APPROACH

- Discover the benefits of a data-centric dashboard accessible to everyone from any device

BUSINESS INTELLIGENCE

- Discover how to get the Ms PowerBI dashboard in Forge

SIMPLIFY ANALYSIS

- Discover how to facilitate the data analysis

Who we are



MARTINA SCOGLIO

Serial dreamer with both feet upon the ground, always optimistic, determined.

In order to guarantee a BIM approach, I believe the concepts to be put in place must be “risks”, “rules”, “interoperability”, “multidisciplinary”, “solutions”, “changes”, with the consequent detachment from the apparent need to be necessarily innovative in favor of doing things. To do useful things.



ALEX GIOSO

Sportaholic, aspiring filmmaker, out of the box thinker.

Since 2010 in Oil & Gas industry, for Saipem. Ensuring the implementation and contributing to the growth of the enterprise software platform turning complexity into simplicity.



LUCA BAZZOCCHI

An explorer and proud Autodesk since 2008, looking always towards the future for new challenges and learnings!

As Principal Solution Architect in Autodesk CSO, works on projects worldwide, covering different industries.

Has been adopting and evangelizing Forge since the very beginning. He is continuously looking to stand at his customers side in their Digital Transformation journey.

Saipem





GLOBAL SOLUTION PROVIDER

WE ARE AN INTERNATIONAL PLAYER IN THE ENERGY
INDUSTRY AND INFRASTRUCTURES

WE ENABLE THE ENERGY TRANSITION

WE OFFER TAILOR-MADE SOLUTIONS

WE HAVE A SENSE OF RESPONSIBILITY

MAIN NUMBERS:

>35,000
EMPLOYEES

€9.1 BLN
REVENUES 2019

70+
COUNTRIES IN WHICH
WE OPERATE

€79 MLN
INNOVATION
INVESTMENT 2019



WHAT DRIVES US

OUR VALUES

Care for people & planet
Striving for trust
Creative intelligence
Enhancement of cultural identities

OUR MISSION

To complete extraordinary projects by pushing beyond the frontiers of innovations, opening the way for our clients towards the energy of the future.

OUR VISION

To turn the dreams of our clients into reality thanks to our ability to innovate and our technological competence, supporting their progress in the energy transition.



Challenges & Objectives



Saipem's Objectives

MACHINE RELIABLE DATA

Make it structured, interoperable, standards-based and let it flow through the stages of a project

Define common standard that guarantee coherent information contents, their flow and their restitution

PROCESS RULES

DATA DRIVEN DECISIONS

Improving decision speed and managing complexity

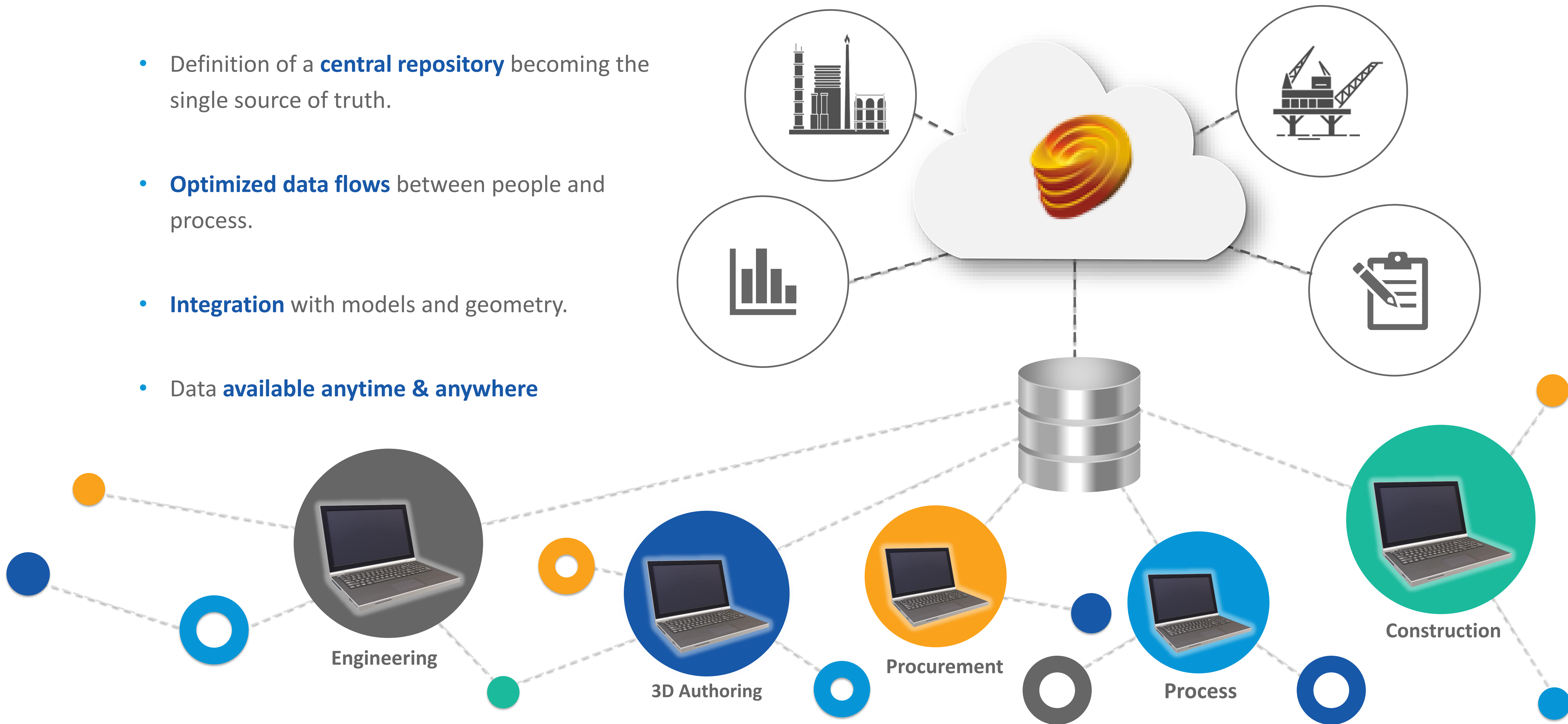
Define multidisciplinary team to create, share, and coordinate vast amounts of project information, maintaining their integrity and decision-making as the project evolves

COMMON FRAMEWORK

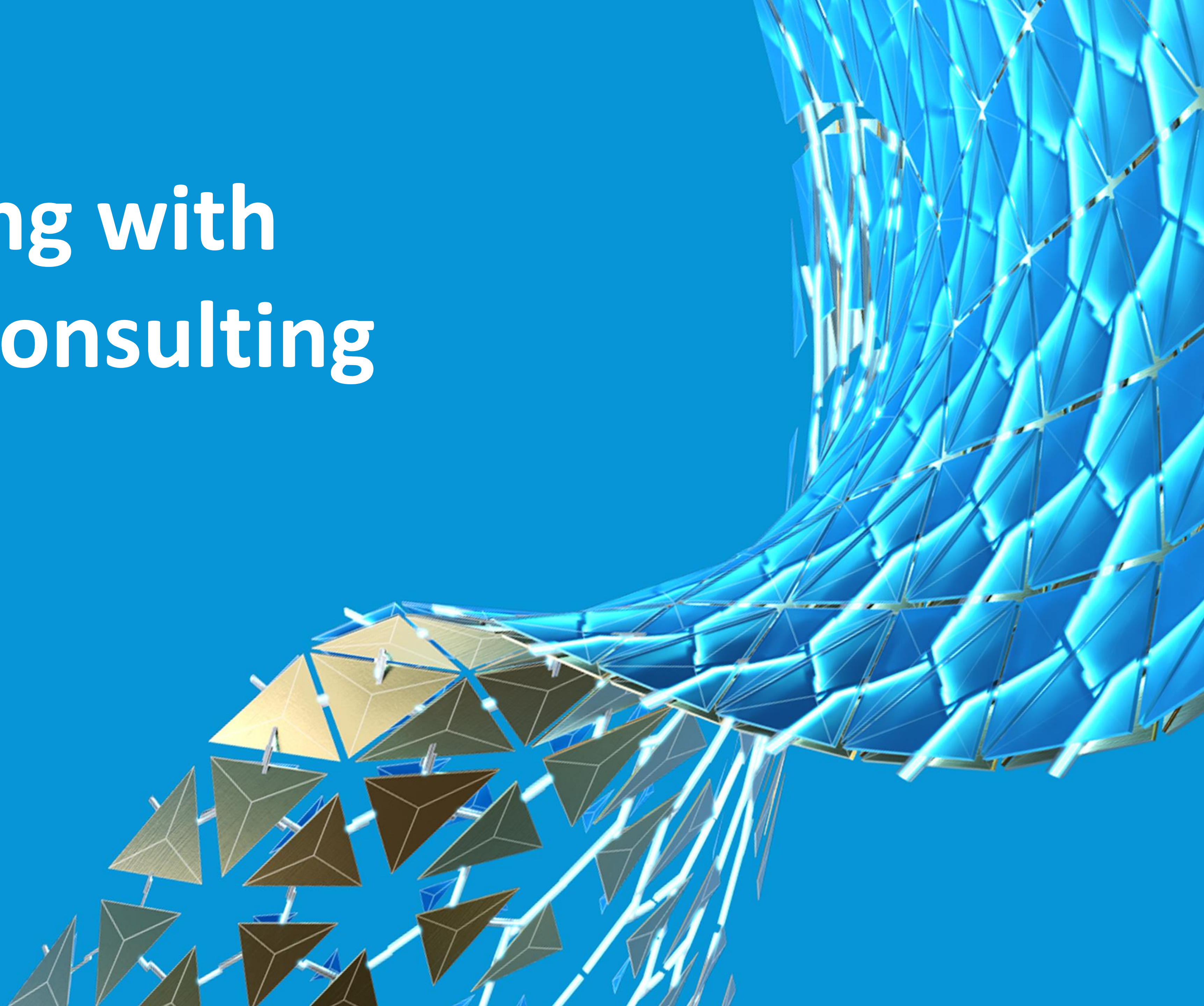


Data-centric Solution/Approach

- Definition of a **central repository** becoming the single source of truth.
- **Optimized data flows** between people and process.
- **Integration** with models and geometry.
- Data **available anytime & anywhere**



Transforming with Autodesk Consulting



A wide-angle photograph of an industrial facility at dusk. In the foreground, several large, white, cylindrical storage tanks are visible, some with blue and white wave patterns at their bases. A complex network of pipes and walkways crisscrosses the ground. In the background, a brightly lit refinery or chemical plant is visible, with numerous tall distillation columns and storage tanks. A tall, slender tower stands out against the dark sky on the right side. The sky is a mix of deep blue and orange, indicating the time is either dawn or dusk. The overall scene conveys a sense of industrial activity and scale.

Transform to THRIVE



PRODUCT
KNOWLEDGE



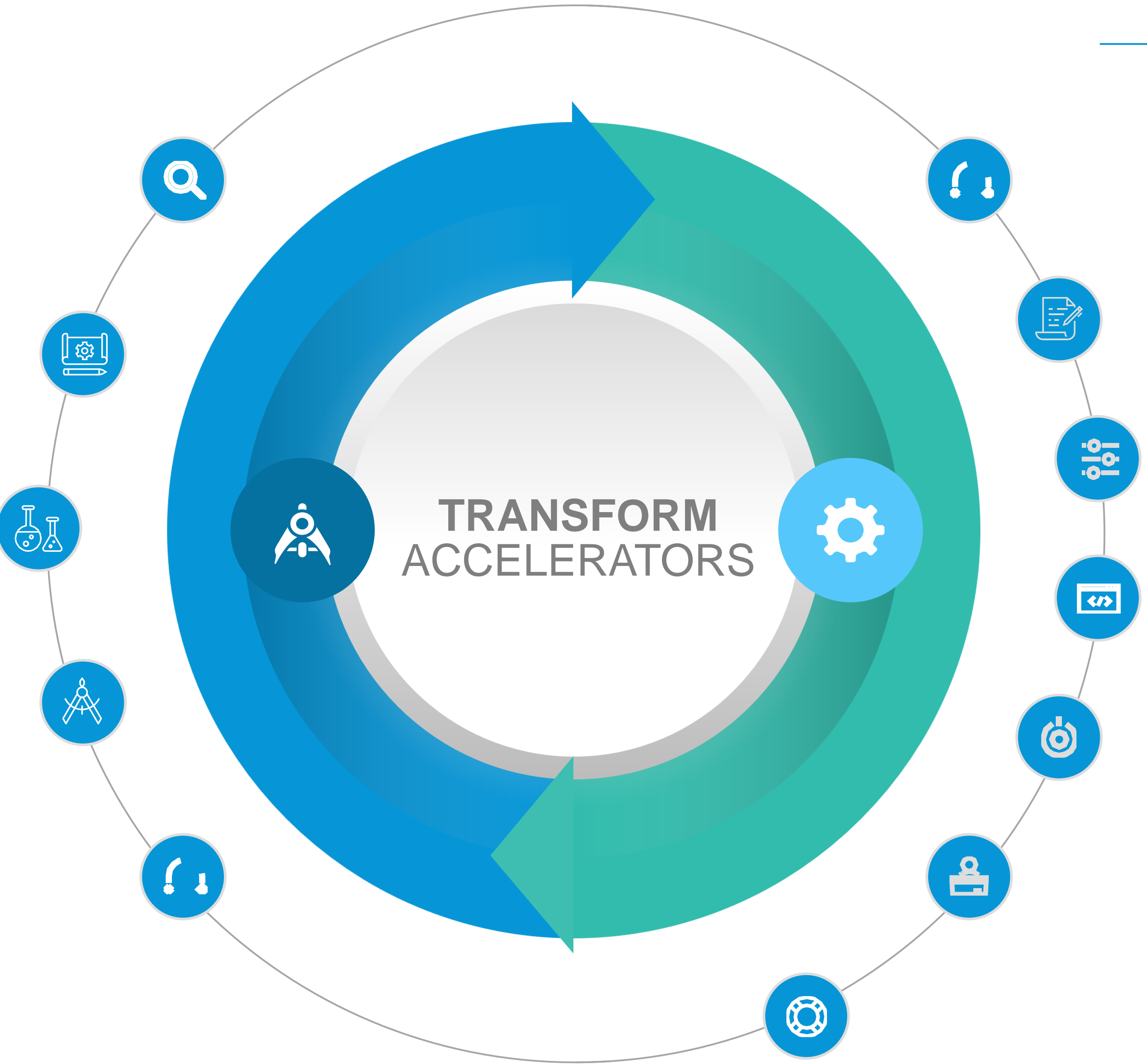
INDUSTRY
INSIGHT



GLOBAL
REACH

Definition

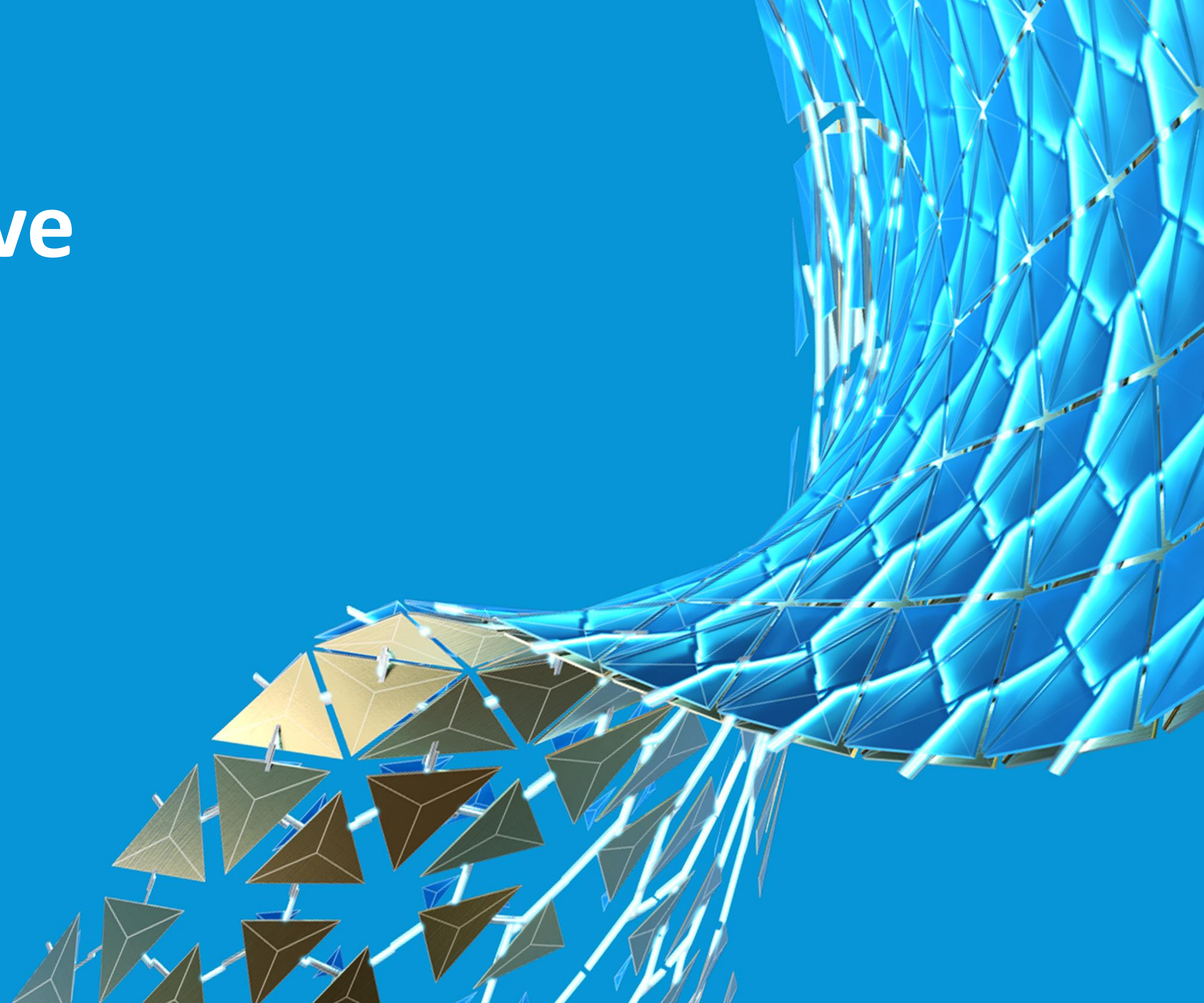
- Assess**
Evaluate your current transformation strategy, processes, practices, and plans for implementation
- Shape**
Refine or define a strategy based on your business requirements and informed by Autodesk insight
- Design**
Define architecture from business, data, application, infrastructure, and integration perspectives
- Validate**
Verify workflow automation, application integration, data connection, and API feasibility
- Plan**
Create a path to develop, integrate, and deploy the solution with visibility of key dependencies



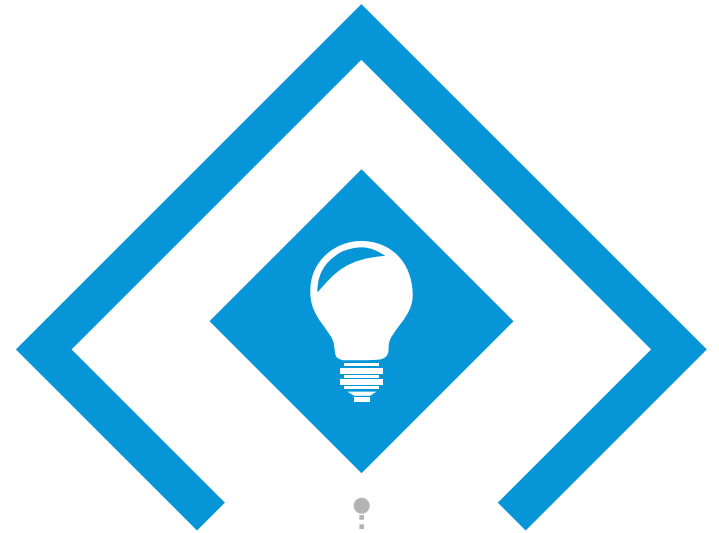
Execution

- Plan**
Schedule, budget, and plan implementation activities in detail
- Define**
Define and document solution processes and workflows
- Configure**
Adjust settings of standard software and configure content
- Develop**
Sprint-based development using public APIs
- Deploy**
Install or upgrade Autodesk technology in the solution
- Train**
Train key users and project teams on the new solution
- Support**
Analyze and troubleshoot implementation related issues

The Initiative

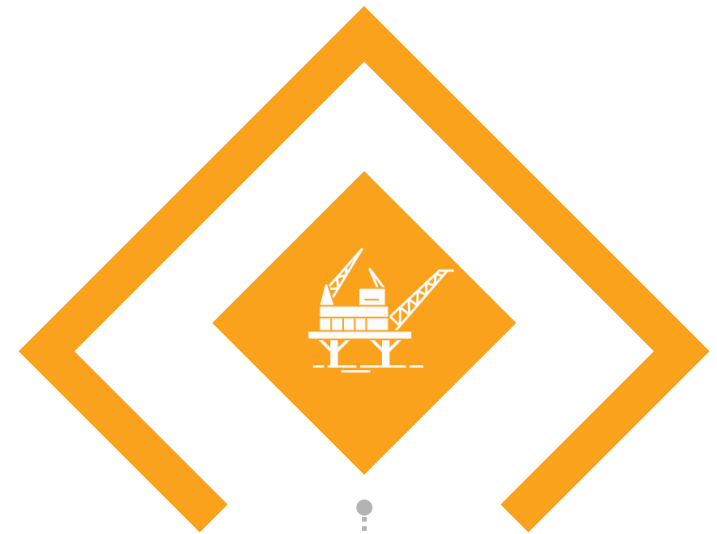


Initiative Progress



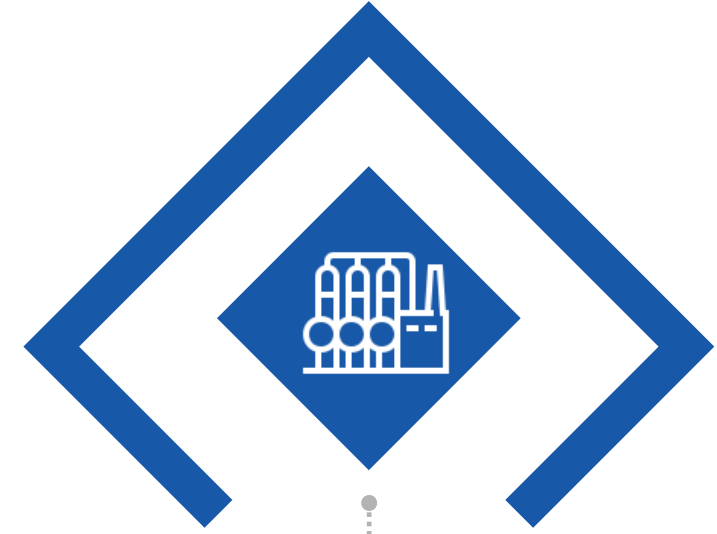
2017

First Proof of Concept
E&C Offshore



2018

WFA & Feasibility
E&C Offshore



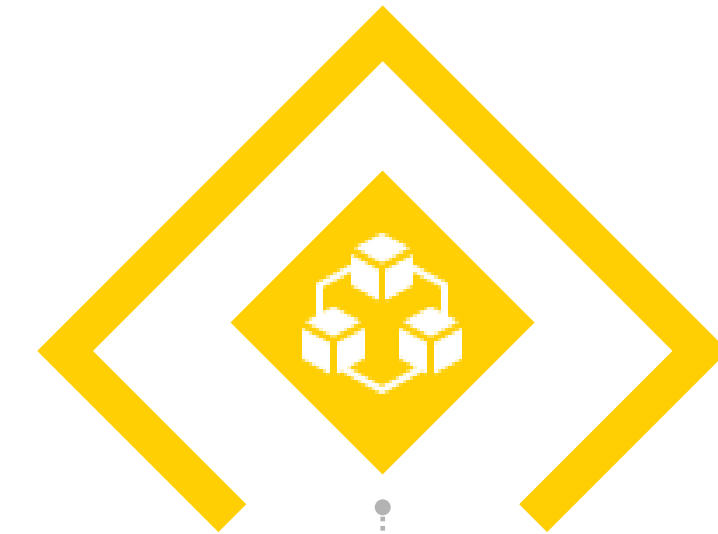
2019

WFA & Feasibility
E&C Onshore



2019

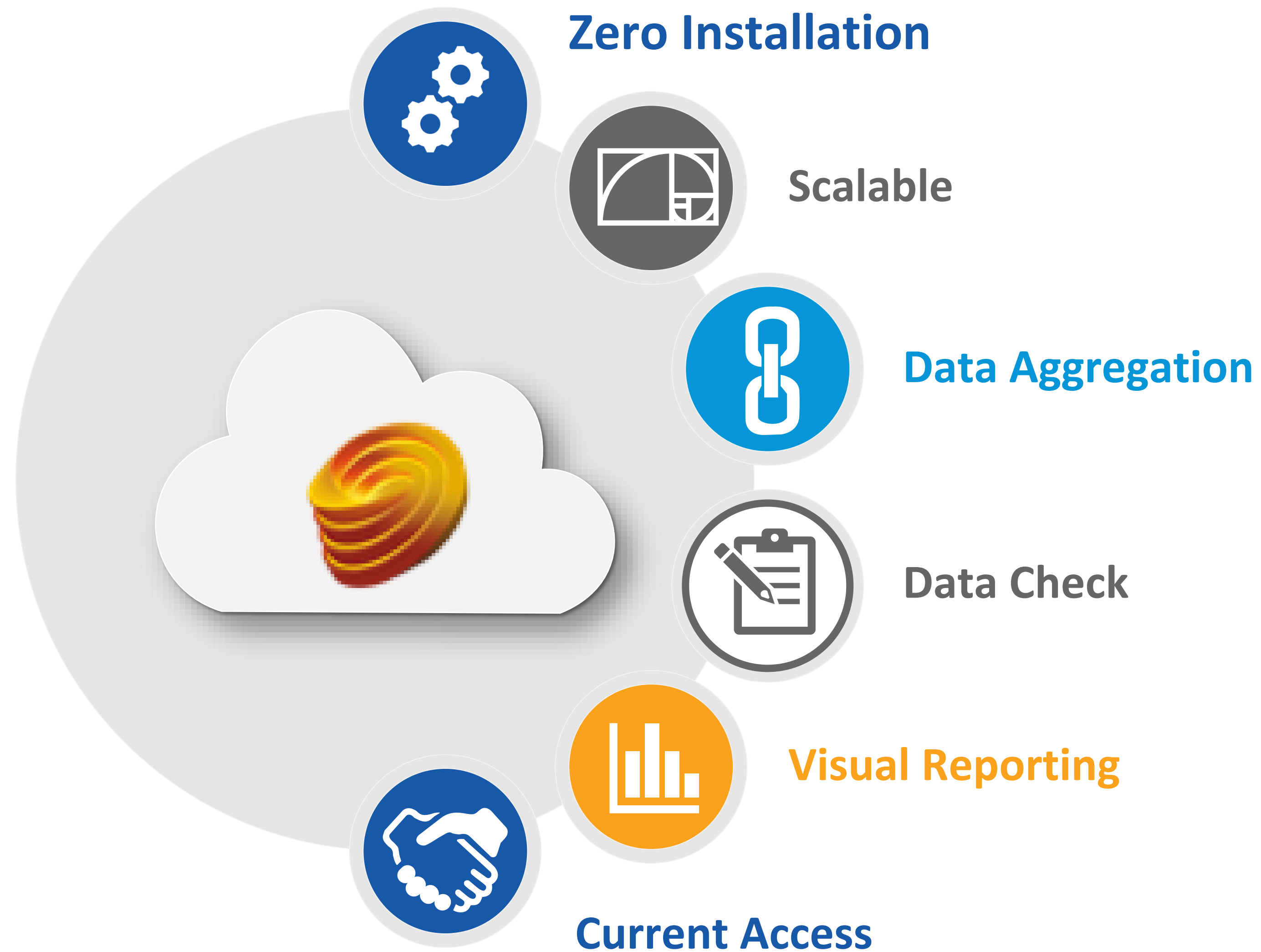
BIM 360 Steel Structures
E&C Offshore
E&C Onshore



2020

Ent. Dashboards AWP
E&C Offshore
E&C Onshore

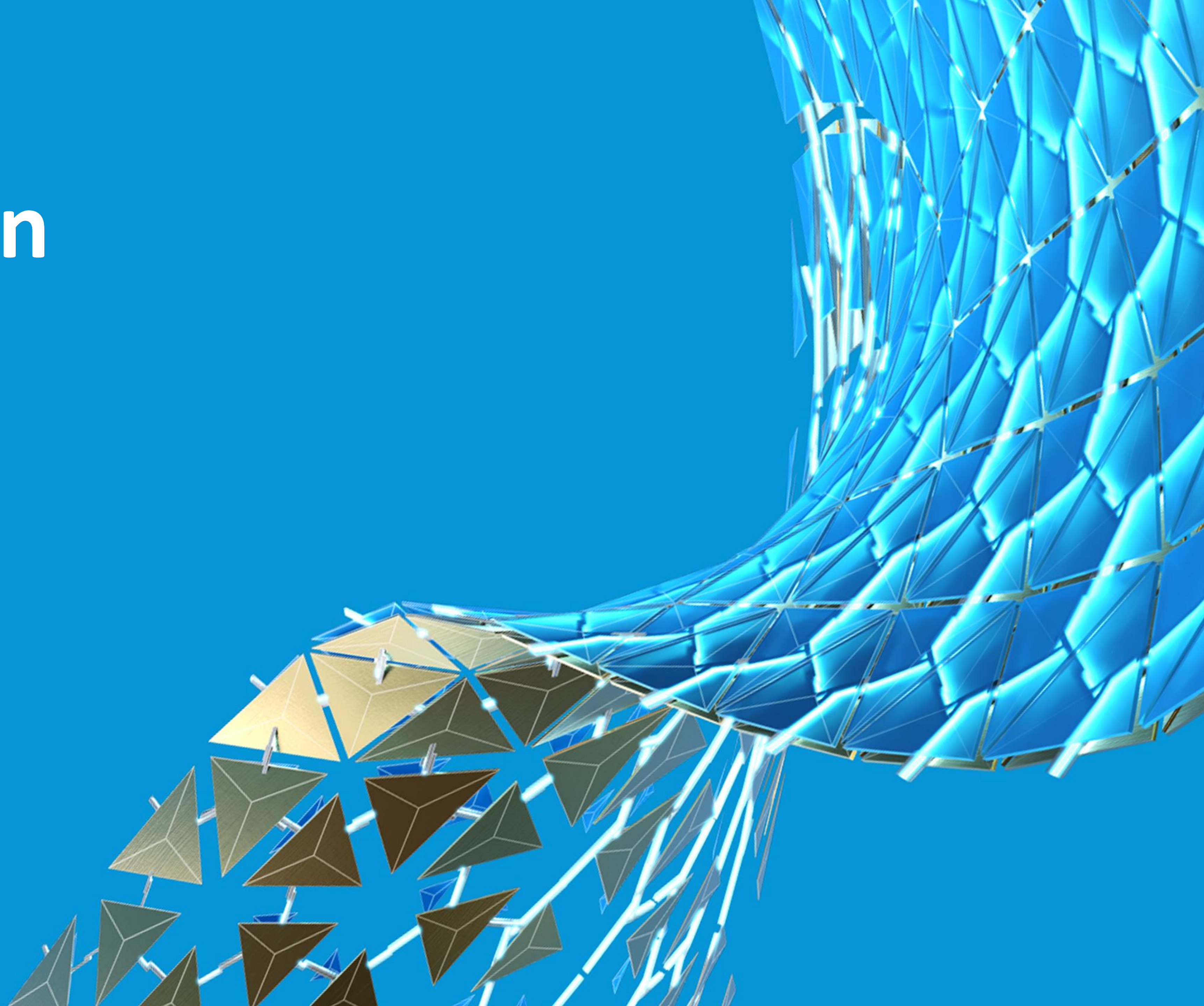
Benefits of Using Forge Platform



Solution Overview



The Solution

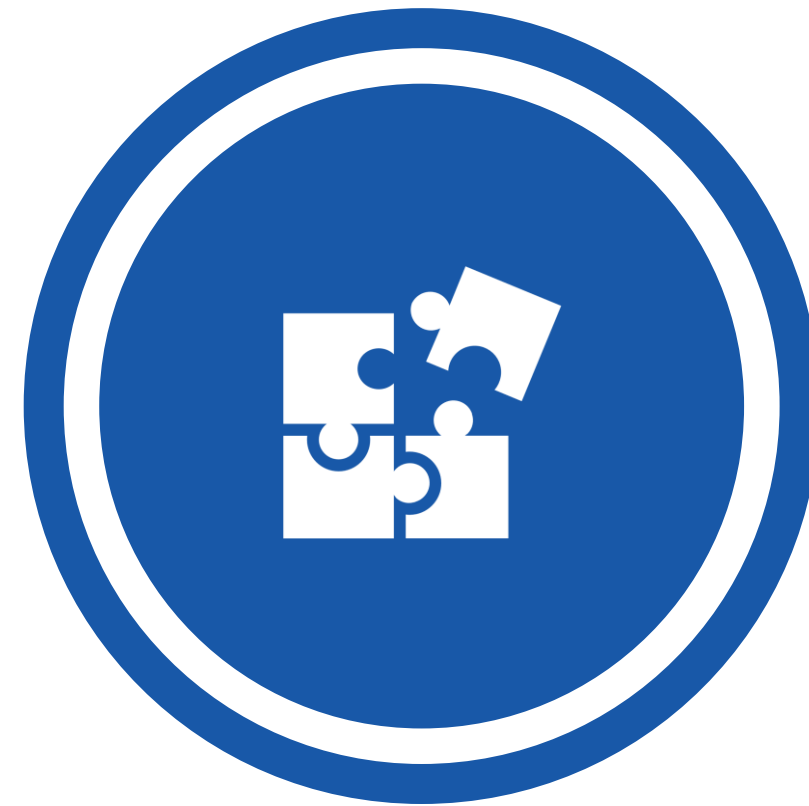


The Solution



MS POWER BI

moving
from a legacy
system to a smart
solution...



AWP

making simple the
uneasy...



MULTIMODEL

creating endless
comparisons...



DATA ANALYSIS

...solution, what
else?



OTHERS

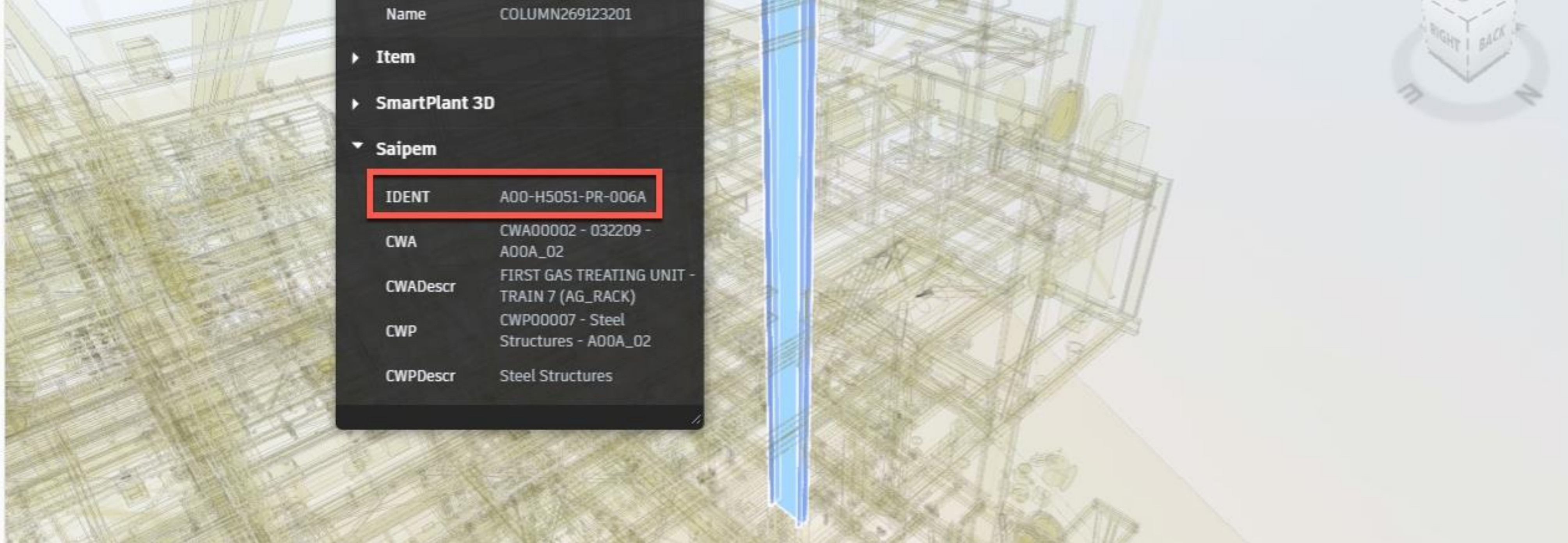
smallest, but
greatest...

Ms PowerBI Integration



DEVELOP VISUAL AND INTERACTIVE DATA ANALYSIS

Allow users to ask questions and find answers on their own, have new insights, understand how a critical point has been reached and make decisions accordingly.



< Back to report

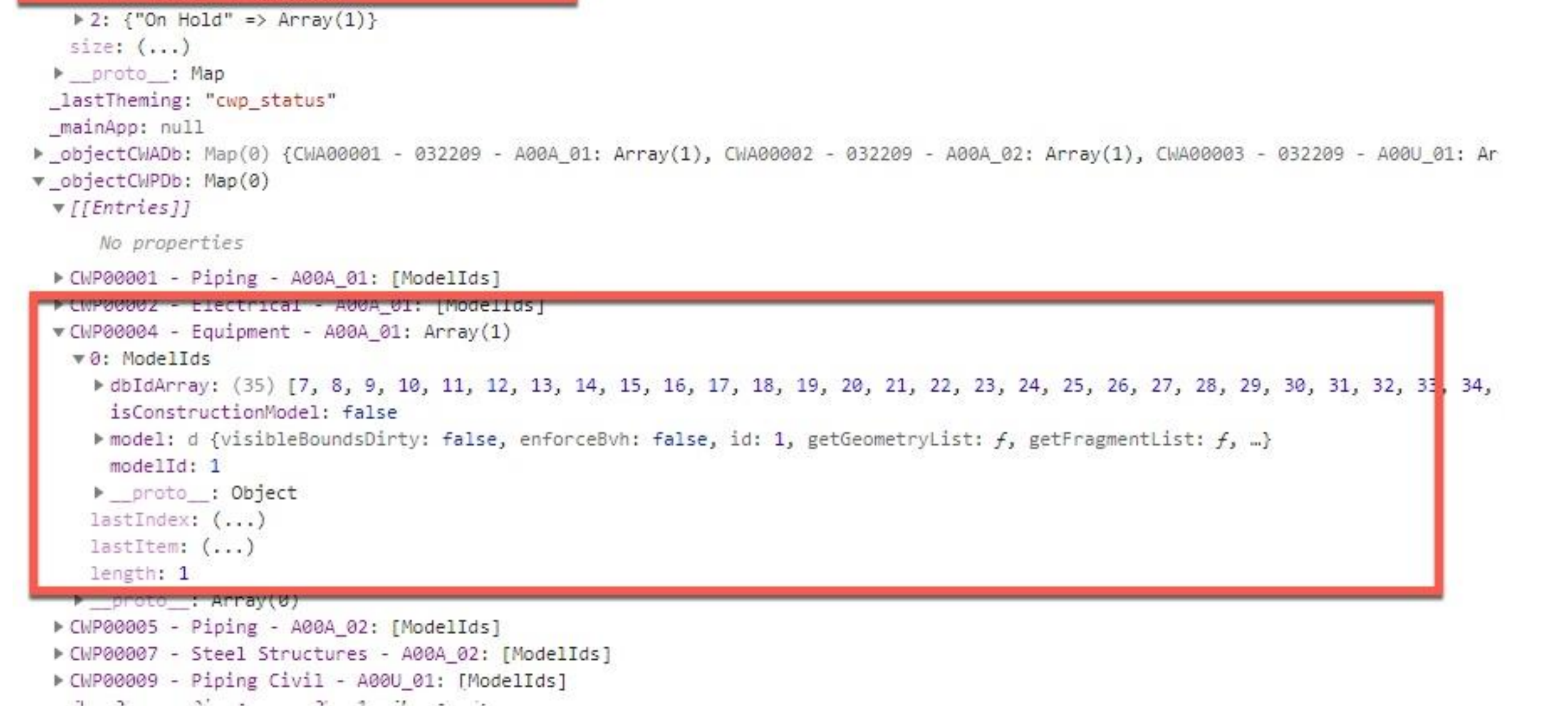
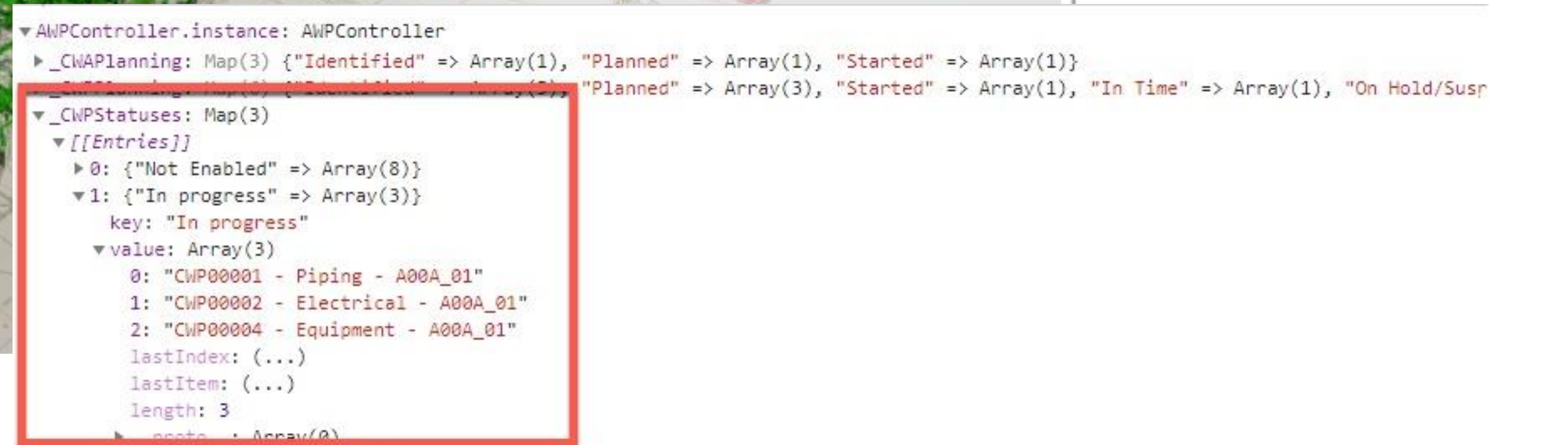
ITEM
A00-H5051-PR-006A
A00-H5051-PR-006A
A00-H5051-PR-006A

<

AREA, SUBCMC, SUBCMC DESCR., ITEM, % PROGRESS
A00, MC2410, Ere.medium-heavy str.steel, A00-H5051-PR-006A,
A00, MC2420, Ere.of light str.steel, A00-H5051-PR-006A, 53.19%
A00, MC2426, Ere.grating panels/stair step, A00-H5051-PR-006A

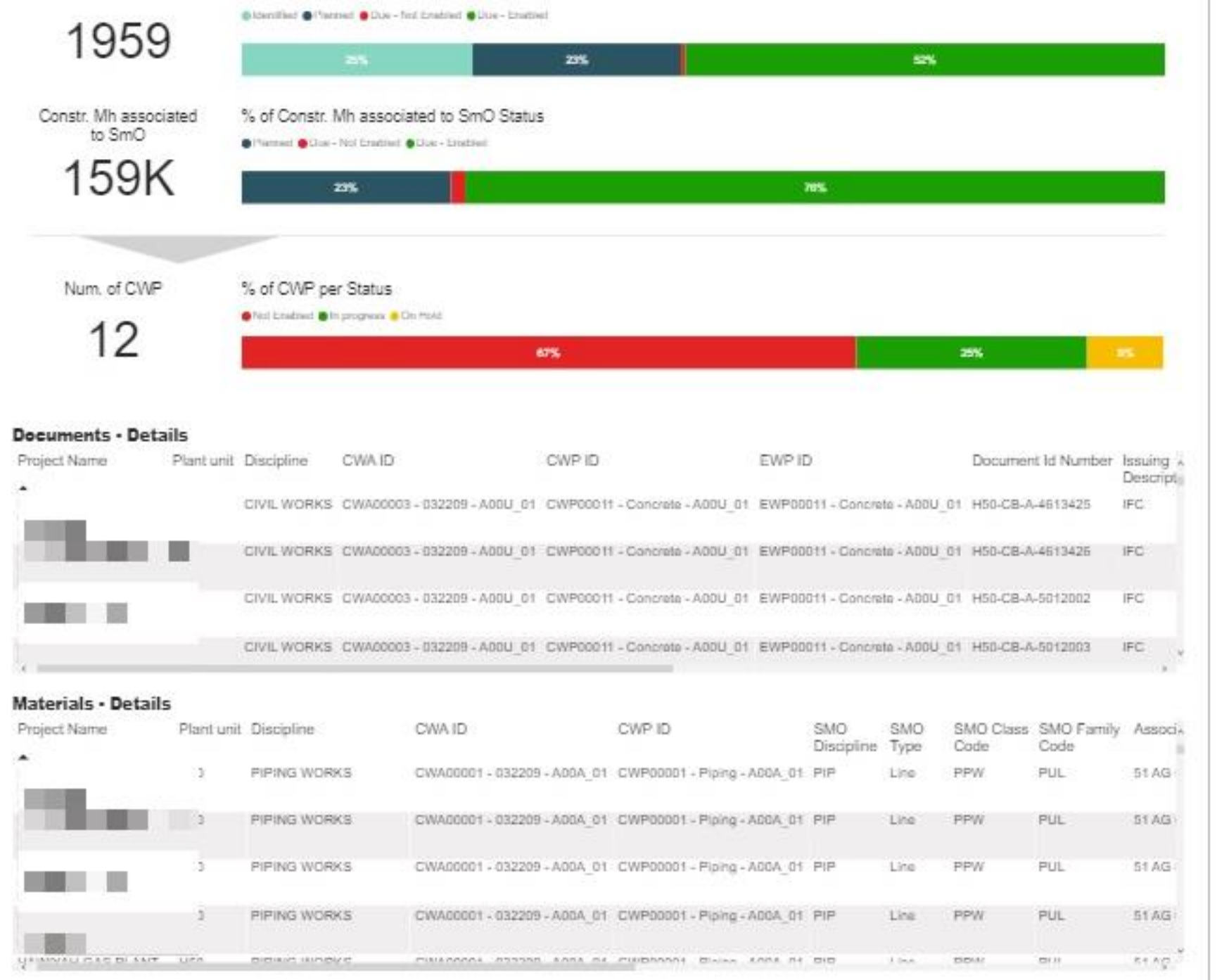
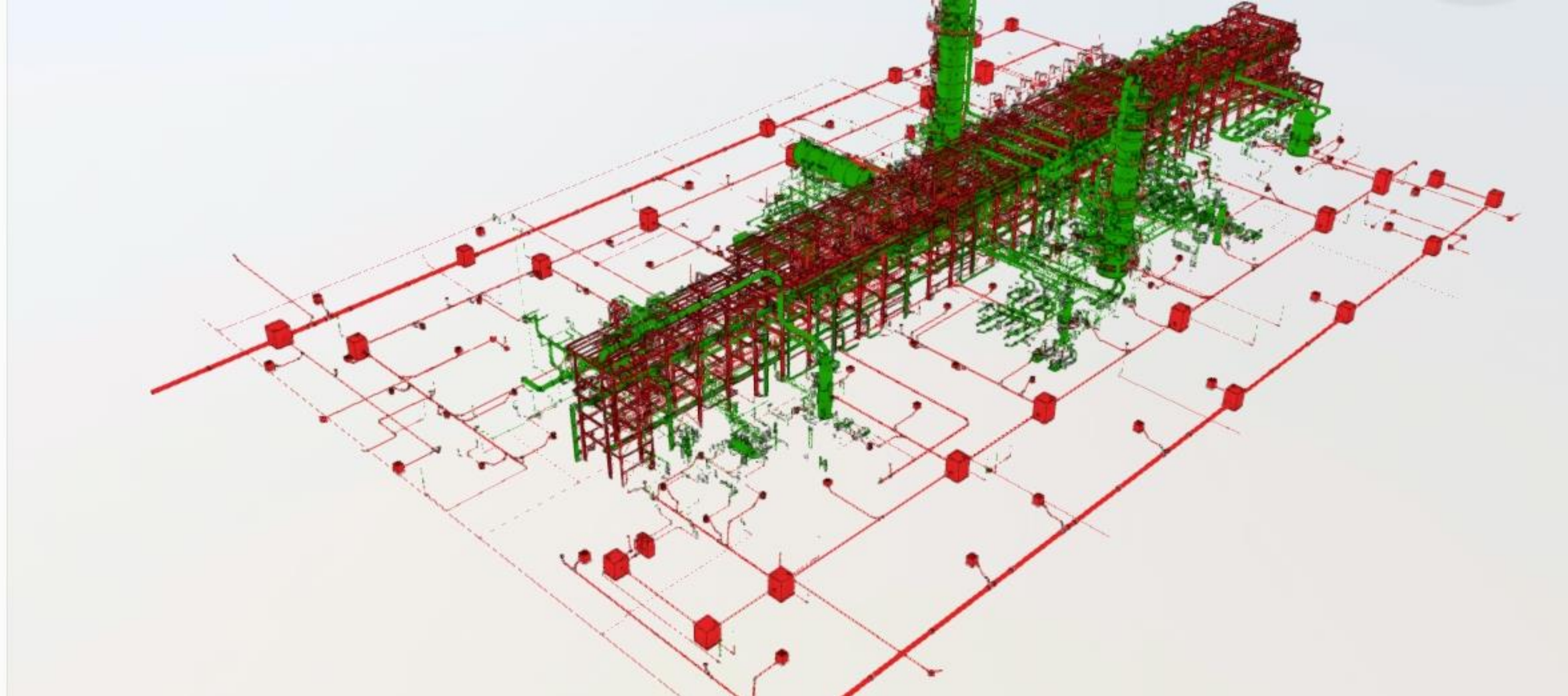
Ms PowerBI Integration

It is all a matter of data....



Ms PowerBI Integration

It is all a matter of data....



Ms PowerBI Integration

....handling Events properly....

```
// Report.off removes a given event listener if it exists.
report.off("pageChanged");

// Report.on will add an event listener.
report.on("pageChanged", function (event) {
    console.log( "Event - pageChanged: " );
    var page = event.detail.newPage;
    console.log("Page changed to \" " + page.name + "\" - \" " + page.displayName + "\"");
    PowerBIContainerController.instance.ShowCWACWPChooser(false);
    PowerBIContainerController.instance._isAwp = false;

    //Check if it is AWP report
    if (page.displayName.startsWith("AWP")) {
        PowerBIContainerController.instance._isAwp = true;
        if (page.displayName.startsWith("AWP - Status Overview")) {
            AppController.instance.applyThemeNeutral();
            page.getVisuals().then(function (visuals) {
                visuals.forEach(visual => {
                    console.log(visual);
                });
            });
        }
    }
});
```


H02755

Description

Test Project

Project Type

Onshore

Unit

H5051

Structure

H5051-UDP

Model

PLANT_H5051_ADSK_A

Project Configuration

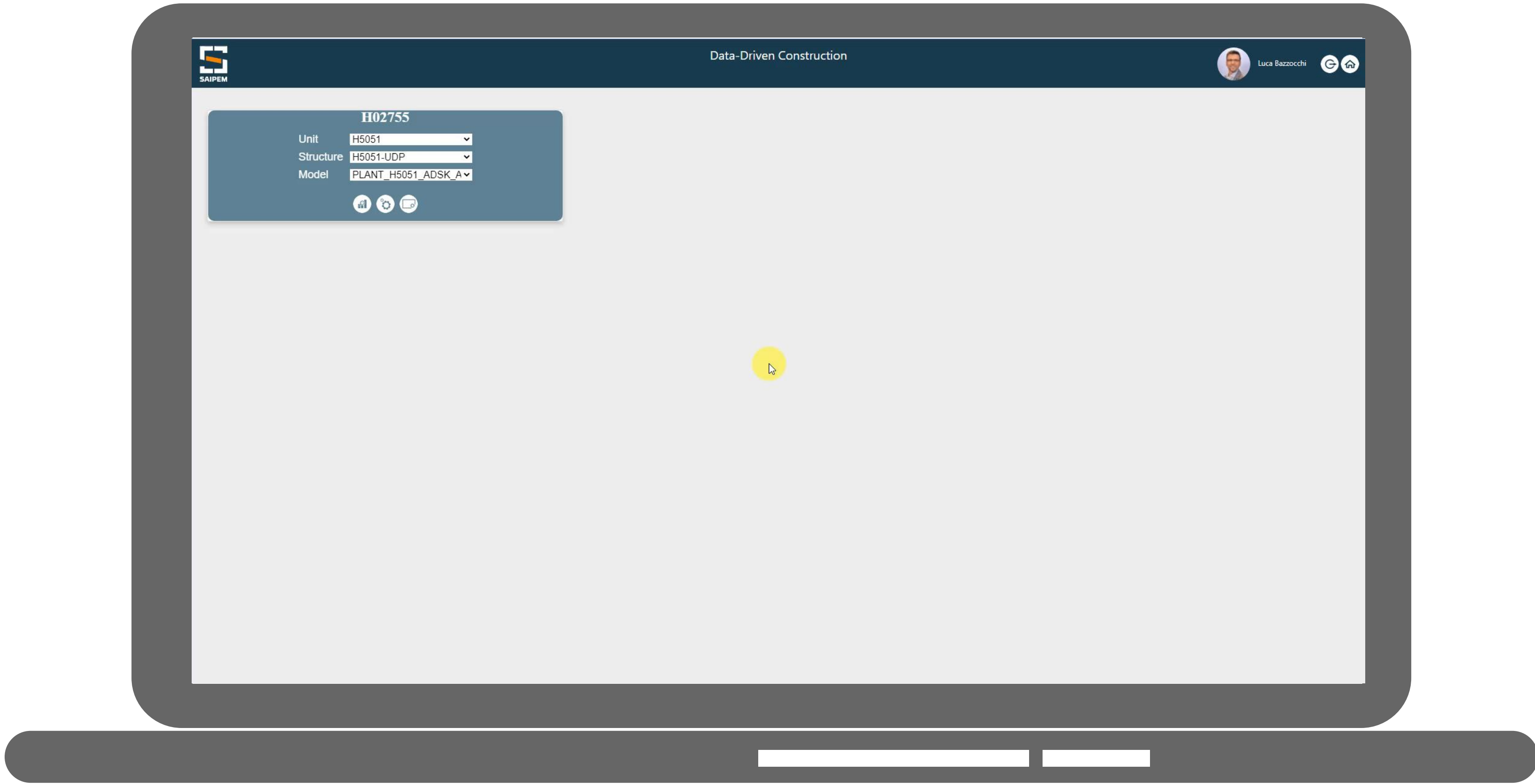
Model Configuration

Users	Analysis	Disciplines	Properties Map	BI Configuration	Properties Charts
Analysis Type	Group	Report	Dataset	Page	<div><div>+</div><div><div></div><div></div></div><div><div></div><div></div></div></div>
Progress	64036112-165e-4b05-b327-b89884999601	2b8593c5-00e6-4c7d-9961-b6f30fa9fb6d	425be335-6dc0-45a1-a8fa-a4dd85ac19db	ReportSectionde75348a75c5340cec64	<div><div></div><div></div></div> <div></div>
AWP	218359ae-e445-4708-bd16-3e6e4d835713	e64f016e-1007-422e-ac8e-1f064975abb4	1742dec8-33e5-4dee-8033-671c77b88ce1	ReportSection0b2ef6066865938c0df7	<div><div></div><div></div></div> <div></div>

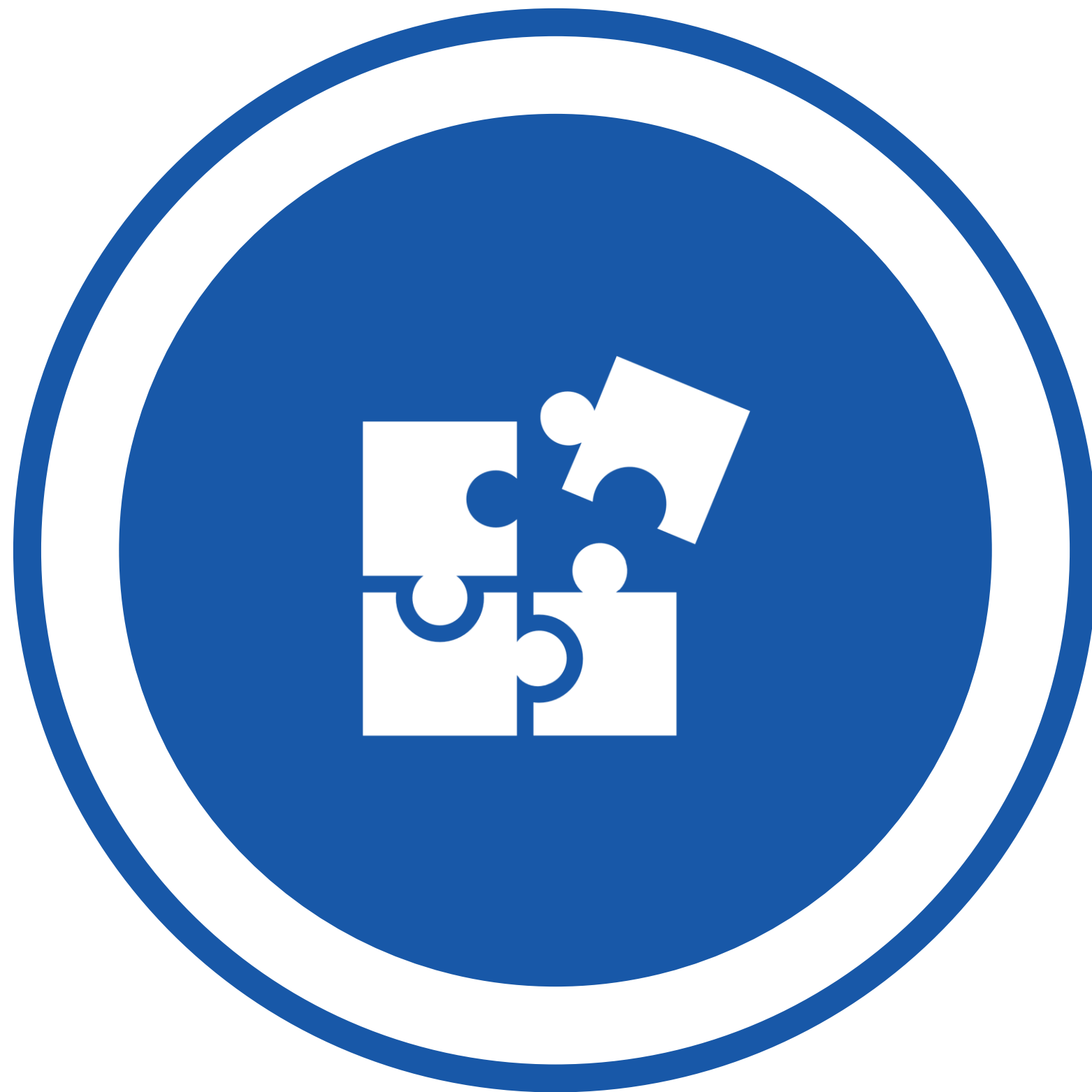
Ms PowerBI Integration

....and make things easy configurable!

Ms PowerBI Integration



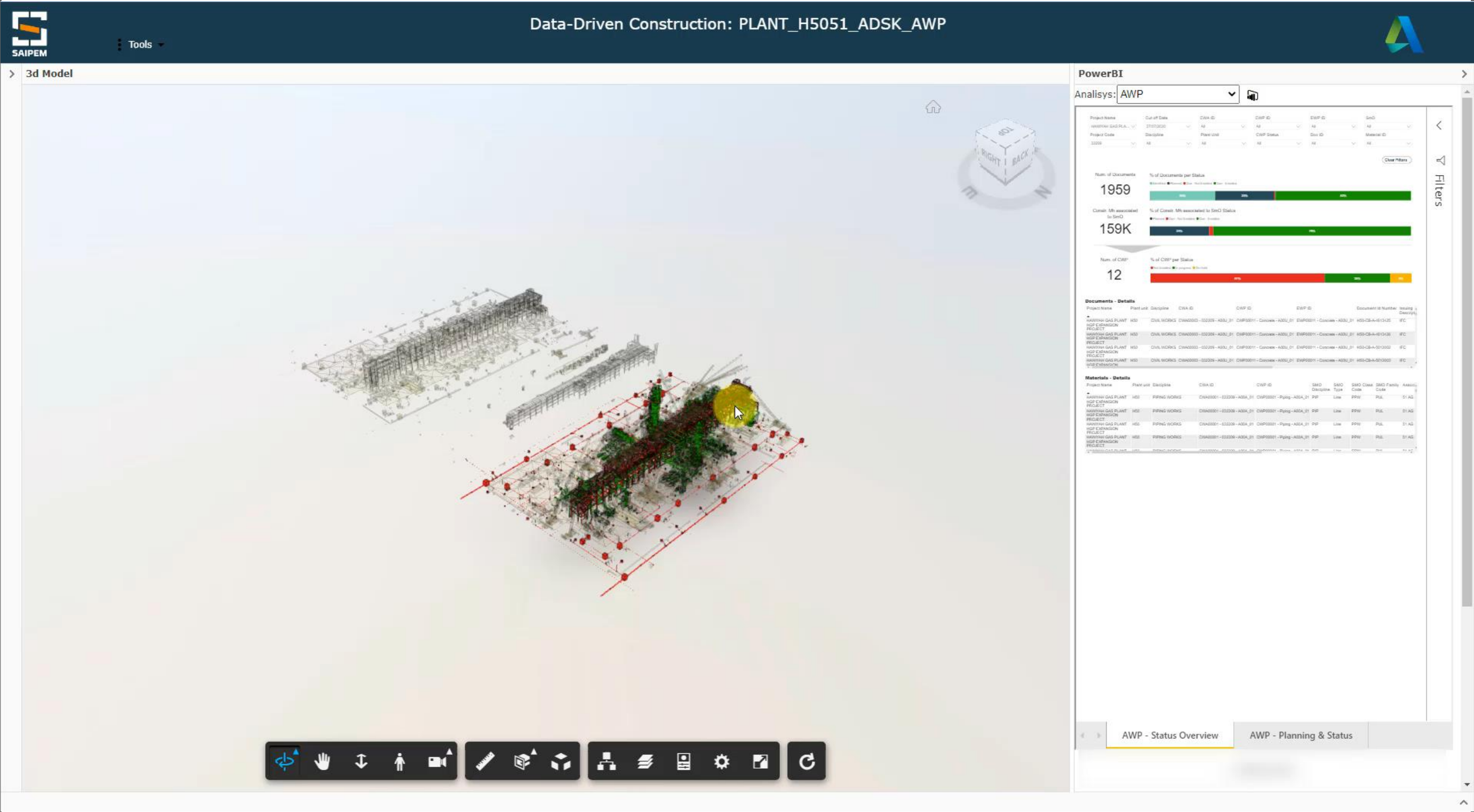
AWP Management



TAKE THE PROJECT BY THE HAND AND DRIVE IT TO SUCCESS

Provide design standards in order to bridge the gap between design results and construction needs during construction work.

AWP Management



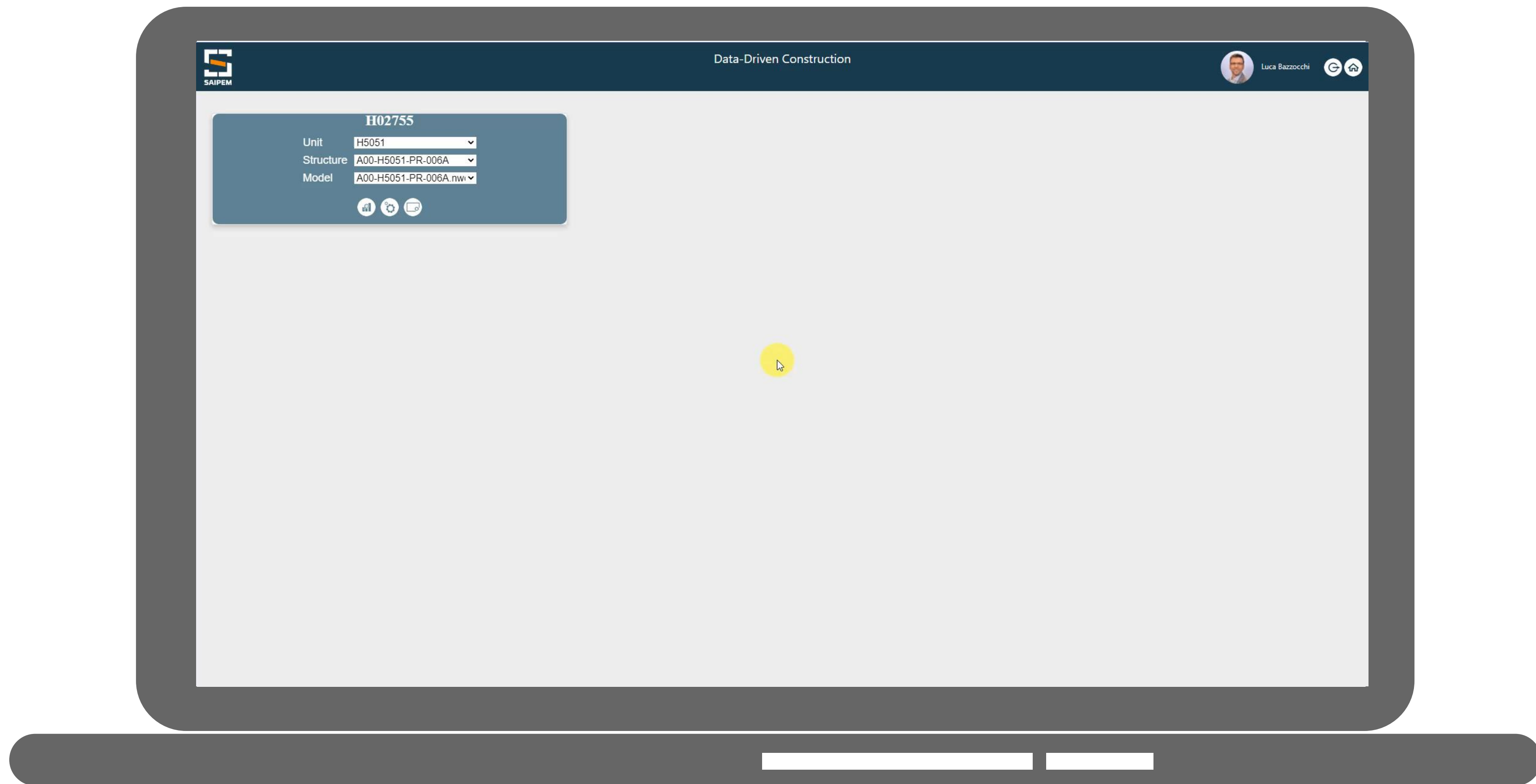
Multimodel

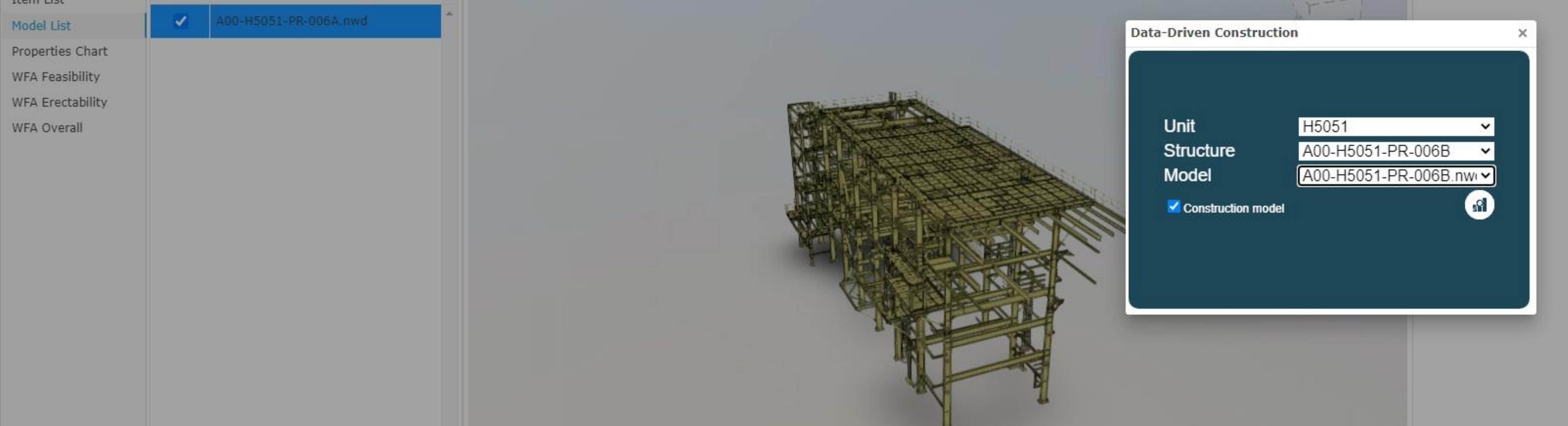


COMPARISON OF DIFFERENT MODELS

Add construction model information to the engineering model and compare different revisions in the same environment.

Multimodel





Multimodel

This functionality allows users to load multiple models in the same Forge Viewer instance with some trick

```
public loadAdditionalModel(urn: string, modelName: string): void {
    this.showLoading("Requesting additional model to Forge " + modelName + "..");

    let documentId: string = urn;

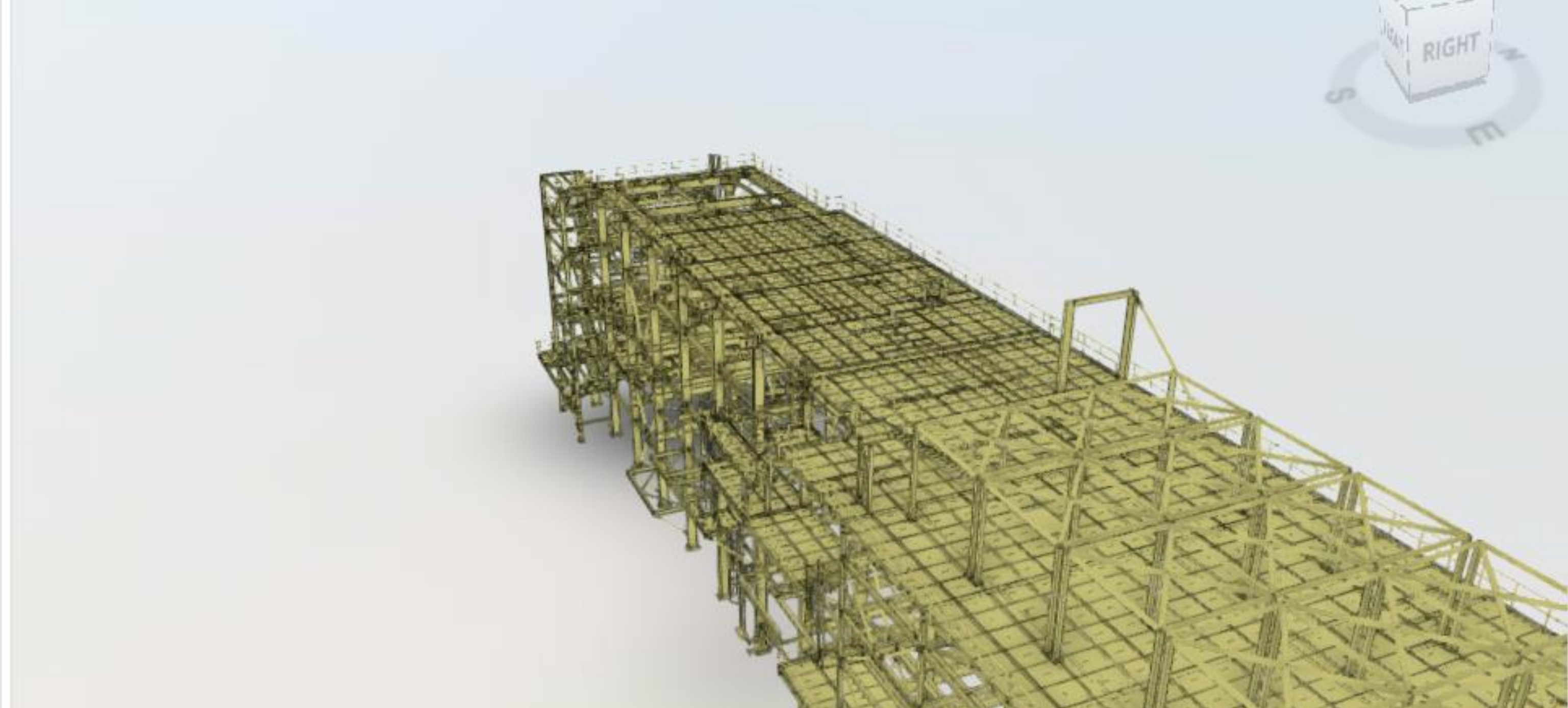
    if (documentId.indexOf('urn:') !== 0) {
        documentId = 'urn:' + documentId;
    }
    this.currentModel = modelName;

    Autodesk.Viewing.Document.load(documentId, (doc: Autodesk.Viewing.Document) => {
        const viewables = doc.getRoot().getDefaultGeometry();
        ViewerController.instance.setCurrentModelName(modelName);

        ViewerController.instance.viewer.loadDocumentNode(doc, viewables, {
            keepCurrentModels: true, applyScaling: 'm', globalOffset: { x: 0, y: 0, z: 0 }
        }).then(() => {
            ($('#mySelectDlg') as any).window('close');

            DisciplineController.instance.invalidateCache();
        });
    }, (errorCode: number, errorMsg: string) => {
        this.onDocumentError(errorCode, errorMsg);
        this.hideLoading();
    });
}
```


Model List	<input checked="" type="checkbox"/>	A00-H5051-PR-006A.nwd
Properties Chart	<input checked="" type="checkbox"/>	A00-H5051-PR-006B.nwd
WFA Feasibility		
WFA Erectability		
WFA Overall		



Multimodel

This functionality allows users to load multiple models in the same Forge Viewer instance with some trick

```
public loadAdditionalModel(urn: string, modelName: string): void {
    this.showLoading("Requesting additional model to Forge " + modelName + "..");

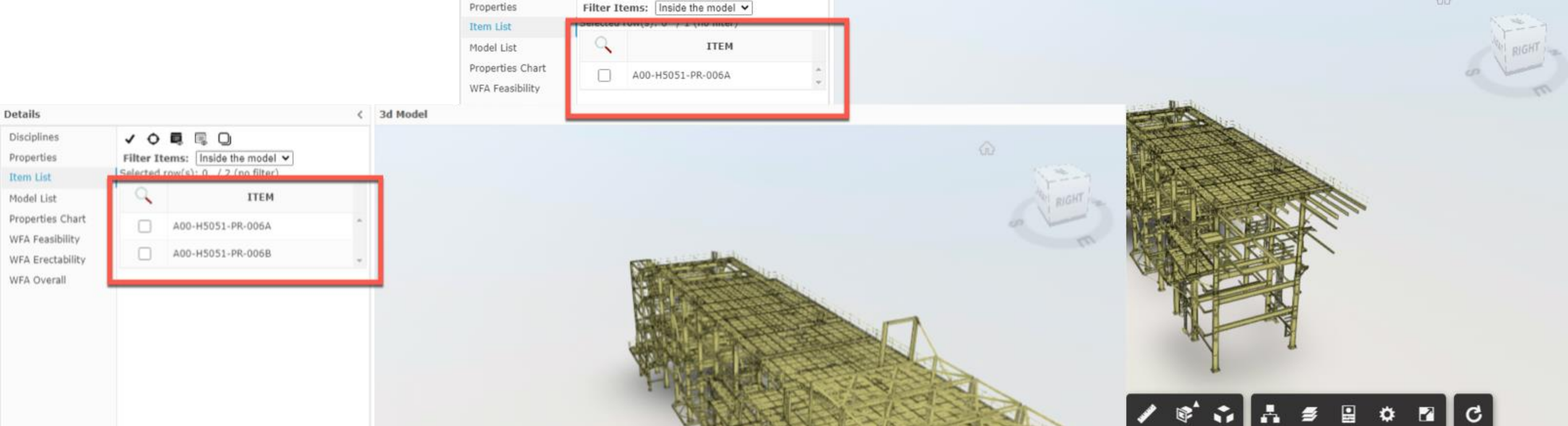
    let documentId: string = urn;

    if (documentId.indexOf('urn:') !== 0) {
        documentId = 'urn:' + documentId;
    }
    this.currentModel = modelName;

    Autodesk.Viewing.Document.load(documentId, (doc: Autodesk.Viewing.Document) => {
        const viewables = doc.getRoot().getDefaultGeometry();
        ViewController.instance.setCurrentModelName(modelName);

        ViewController.instance.viewer.loadDocumentNode(doc, viewables, {
            keepCurrentModels: true, applyScaling: 'm', globalOffset: { x: 0, y: 0, z: 0 }
        }).then(() => {
            ($('#mySelectDlg') as any).window('close');

            DisciplineController.instance.invalidateCache();
        });
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        this.onDocumentError(errorCode, errorMsg);
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```

Multimodel

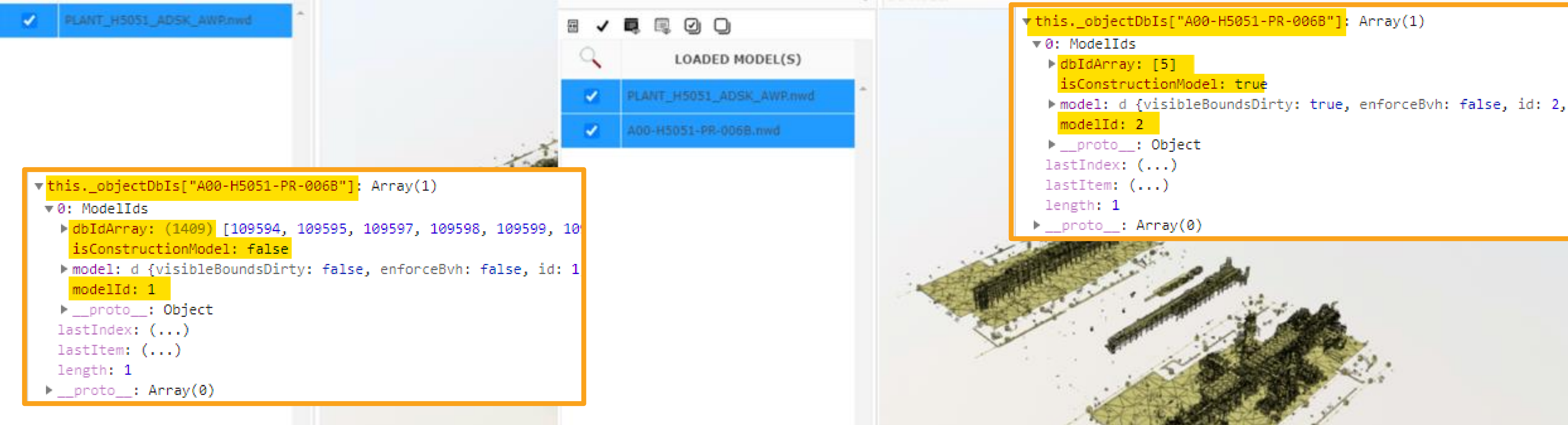
The Solutions also manage all information coming from the different models to manage properly:

- Items
- Discipline
- Analysis

```

▼ this._objectDbIs: Map(0)
  ► [[Entries]]
    ▼ A00-H5051-PR-006B: Array(1)
      ▼ 0: ModelIds
        ► dbIdArray: [5]
        ► isConstructionModel: true
        ► model: d {visibleBoundsDirty: false, enforceBvh: false, id: 2, get...
          ► modelId: 2
          ► __proto__: Object
          lastIndex: (...)
          lastItem: (...)
          length: 1

```

Multimodel

How the data structures are managed behind the scenes to manage Engineering and Construction models in the same Forge Viewer instance

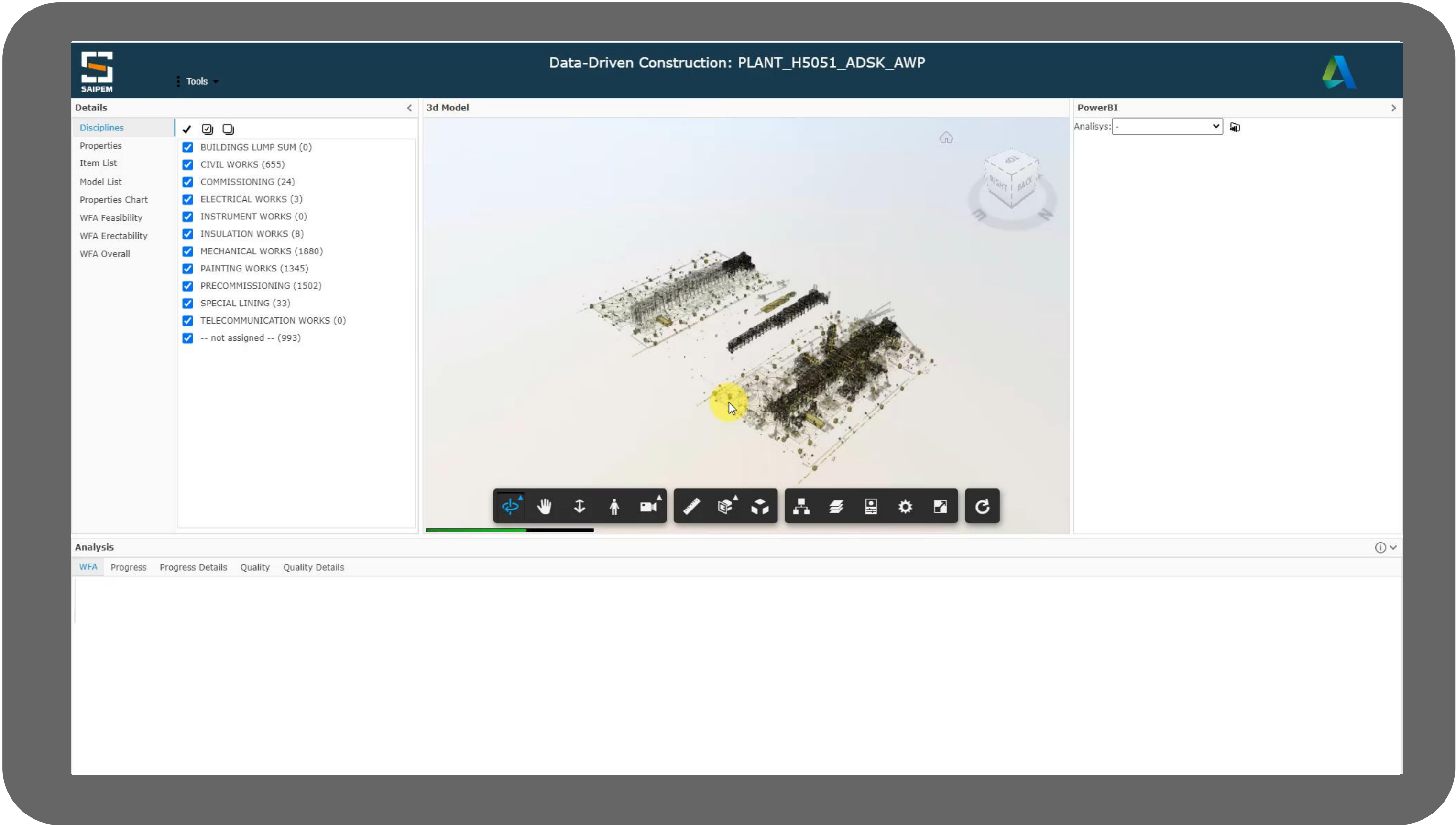
Data Analysis



**DIFFERENT USERS, NEEDS ANALYSIS
AND ONLY ONE ENVIRONMENT**

Guarantee a visualization and navigation of
data customized to the needs of users.

Data Analysis

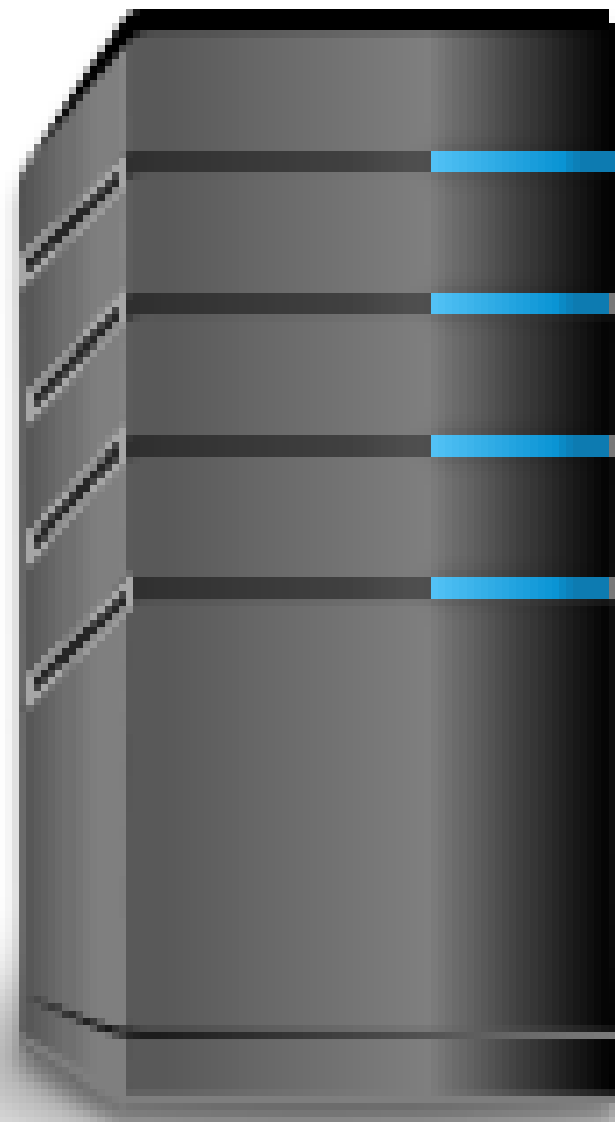


Others

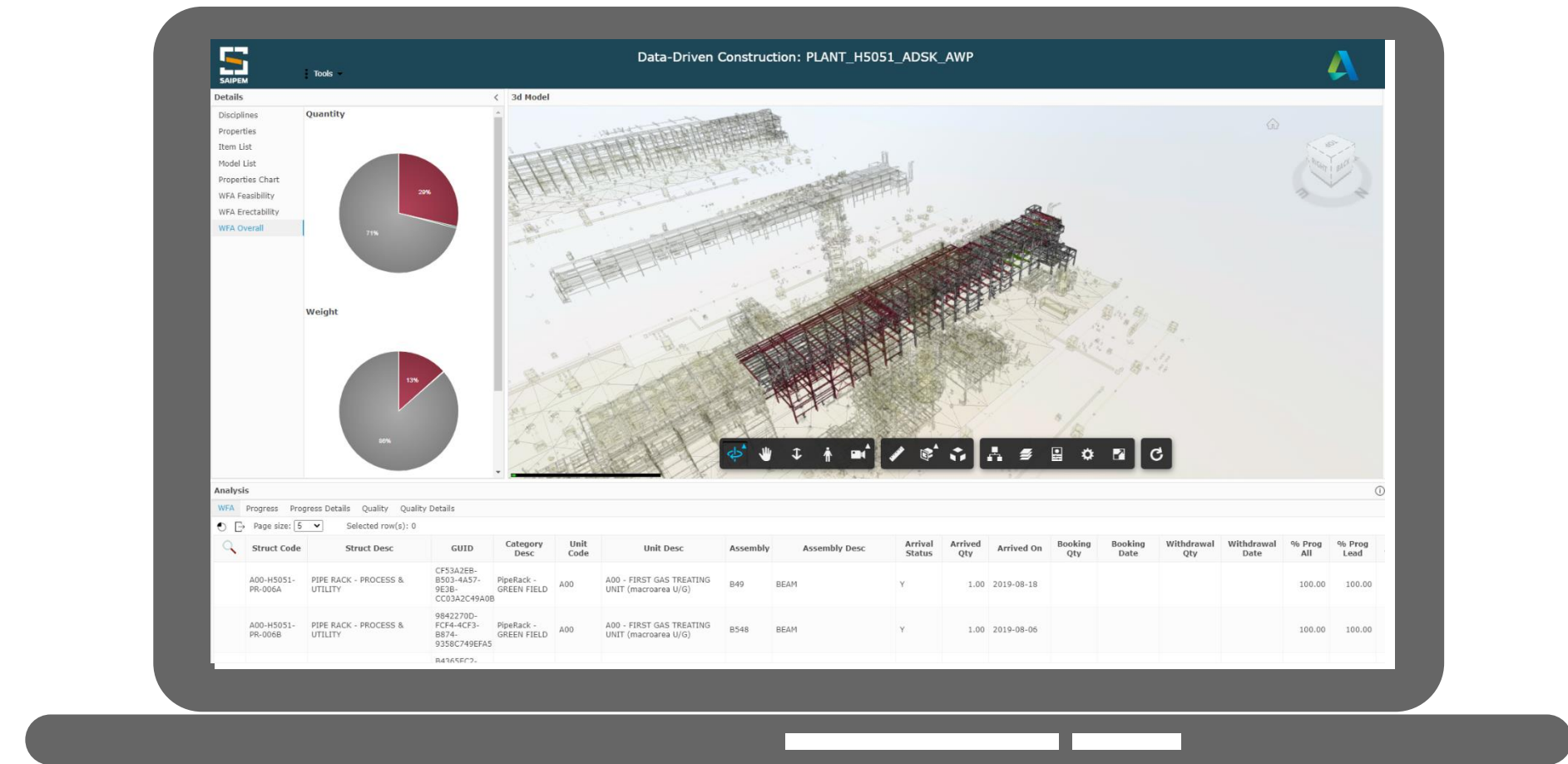


A SINGLE AND SCALABLE SOLUTION TO ENSURE SECURE SHARING

Ensure easy configurations on project, token management and high-level performance.



**2-legged
data: read
account: read**



**3-legged
viewables: read**

Others

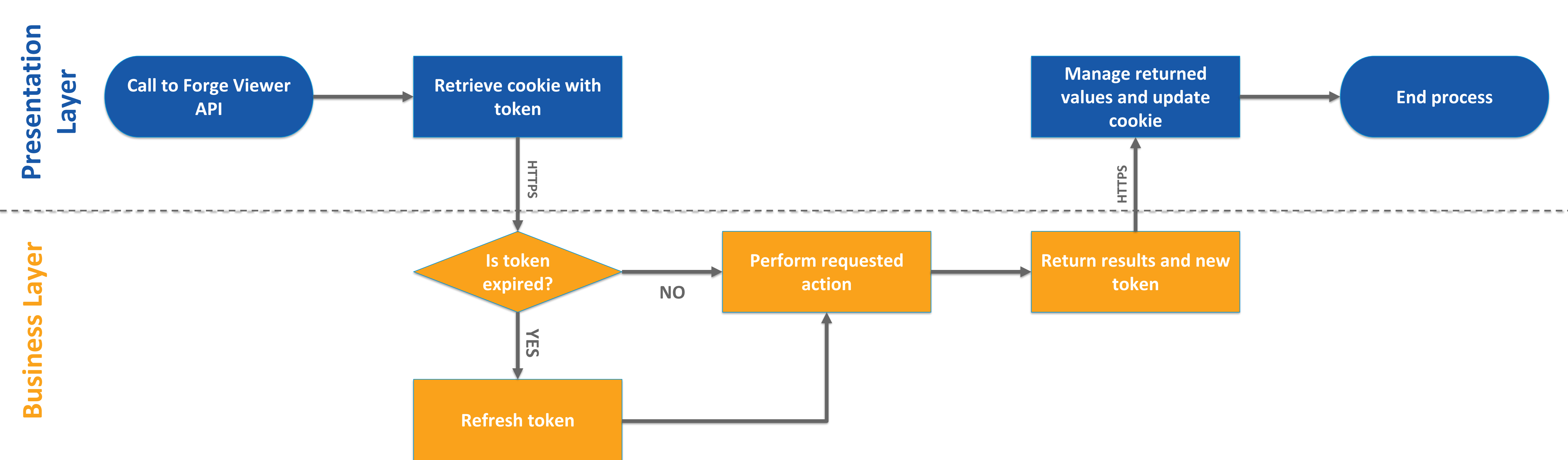
Token Management & Secure Connection

User Experience

Model viewable management

Project Configuration

Enhanced access control



Others

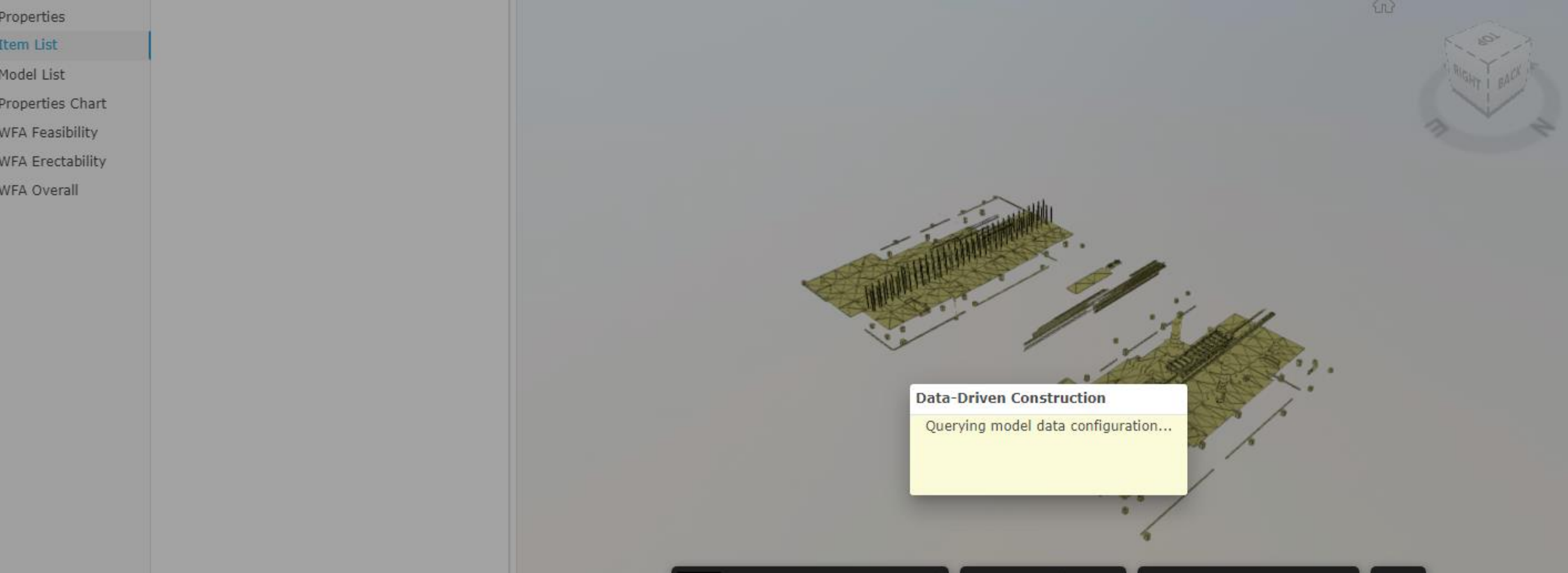
Token Management & Secure Connection

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Others

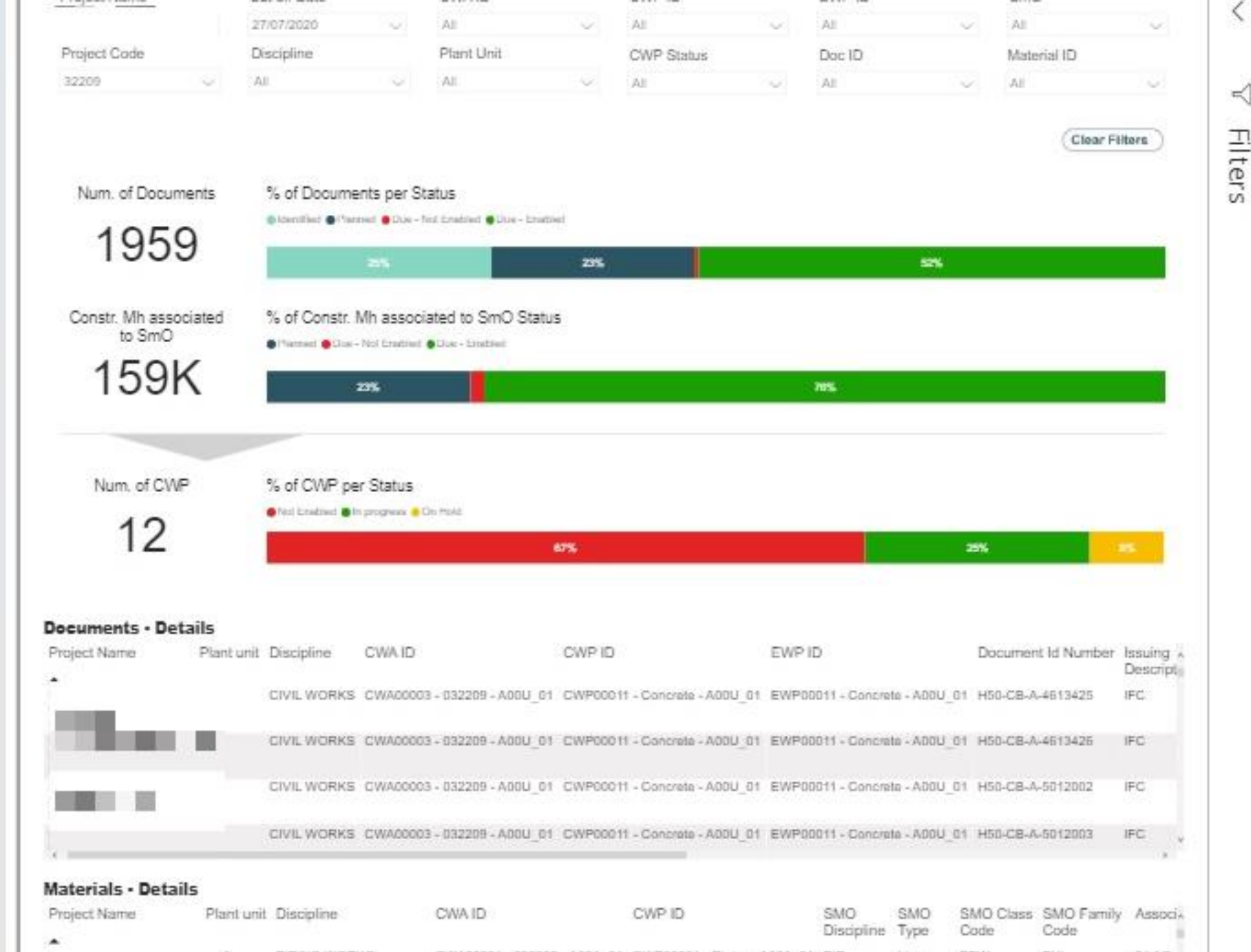
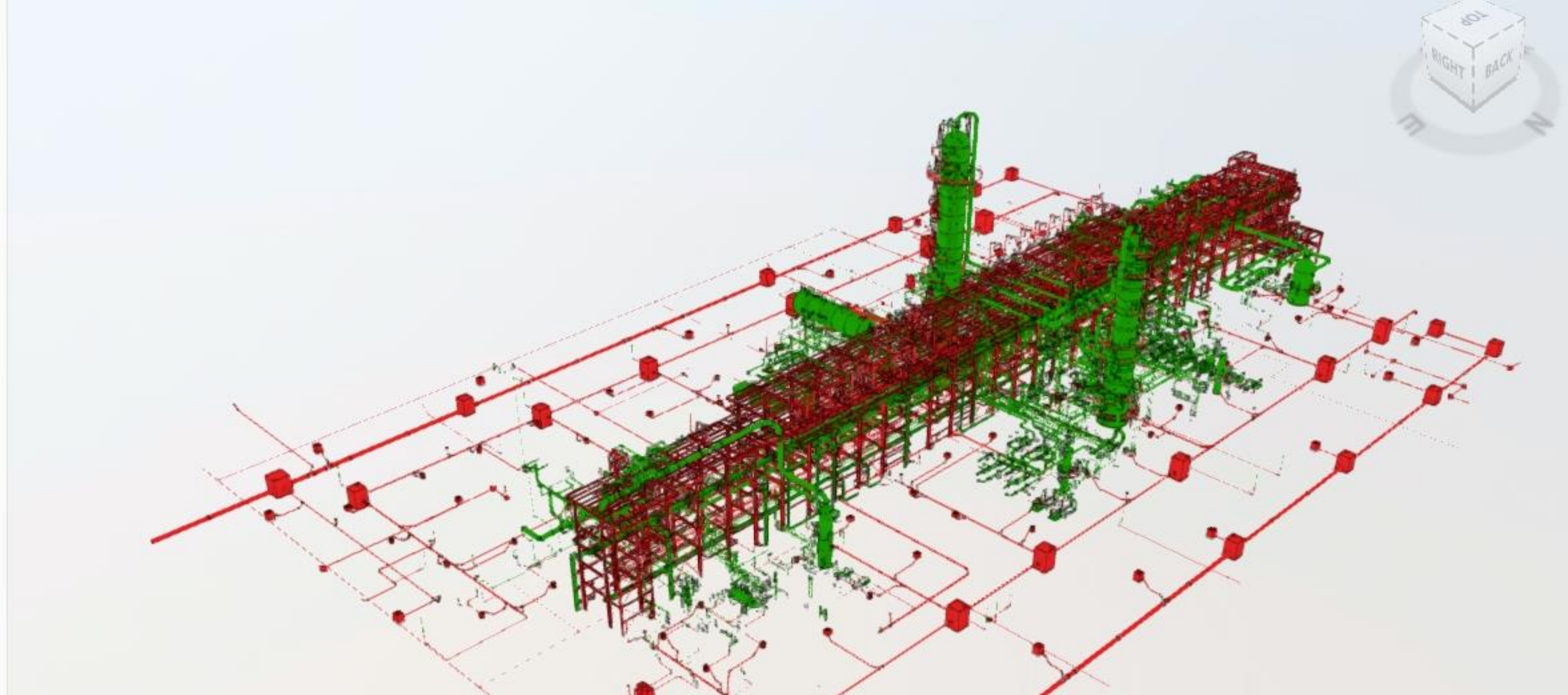
Token Management & Secure Connection

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Others

Token Management & Secure Connection

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Description

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Structure

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Project Configuration

Model Configuration

Users

Analysis

Disciplines

Properties Map

BI Configuration

Properties Charts

Analysis Type

User

Password

Data Source

Query



Progress

SELECT * FROM V_PROM_AGGR_NAVIS WHERE ITEM IN '{ITEMIDS}' and COMMOPER = '{PROJECTNAME}'



Quality

SELECT * FROM V_PCOS_AGGR_NAVIS WHERE ITEM IN '{ITEMIDS}' and COMMOPER = '{PROJECTNAME}'



- - -

SELECT * FROM V PROM NAVIS WHERE ITEM = '{ITEMID}' AND COMPOSITION='{COMPOSITION}' AND



Others

Token Management & Secure Connection

User Experience

Model viewable management

Project Configuration

Enhanced access control

H02755

Description

Test Project

Project Type

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Unit

H5051

Structure

H5051-UDP

Model

PLANT_H5051_ADSK_A

Project Configuration

Model Configuration

Users

Analysis

Disciplines

Properties Map

BI Configuration

Properties Charts

Autodesk ID	Saipem ID	WFA	AWP	Progress	Quality	
		YES	YES	YES	YES	<div><div></div><div></div></div>
		YES	YES	YES	YES	<div><div></div><div></div></div>
		YES	YES	YES	NO	<div><div></div><div></div></div>

Others

Token Management & Secure Connection

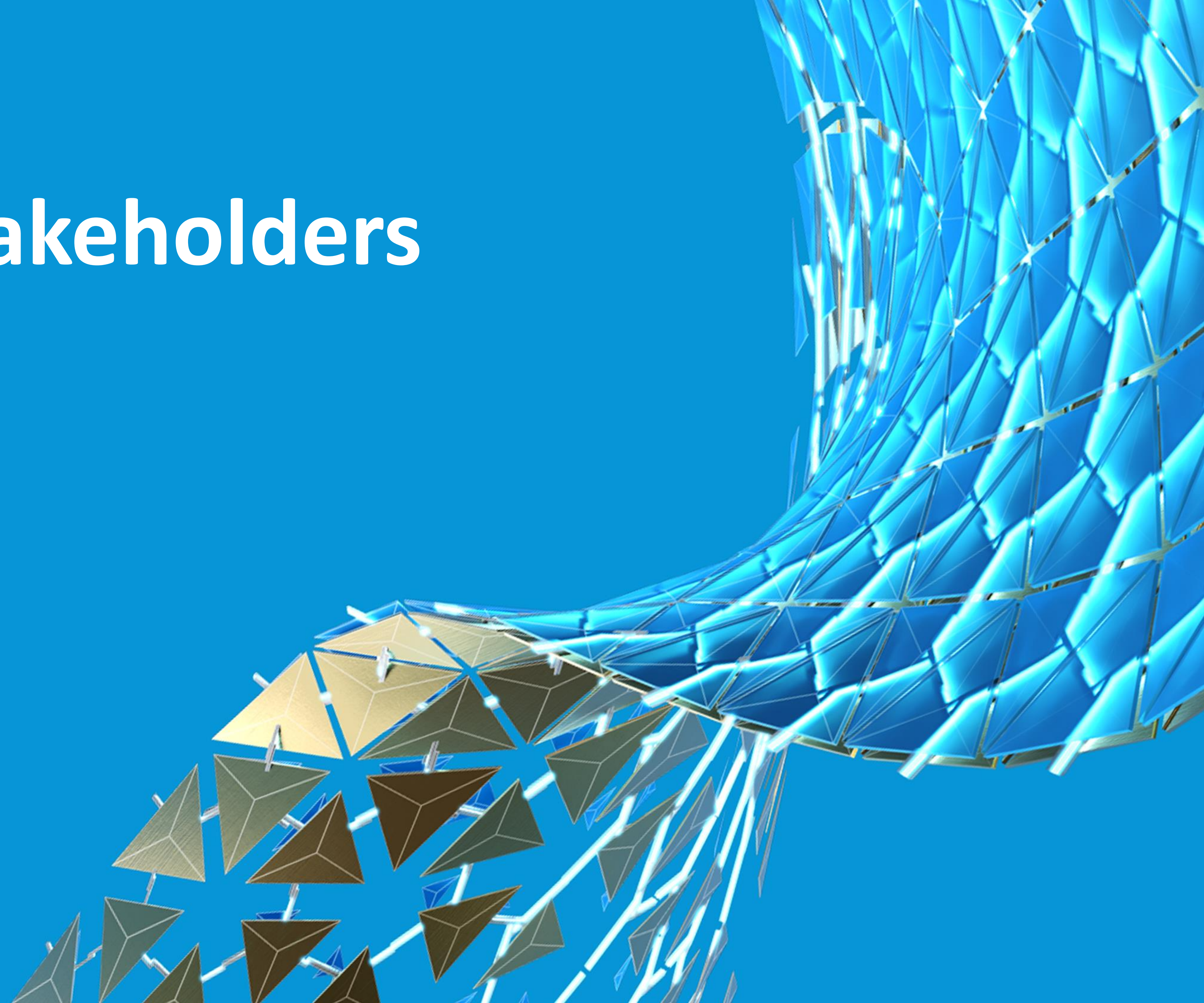
User Experience

Model viewable management

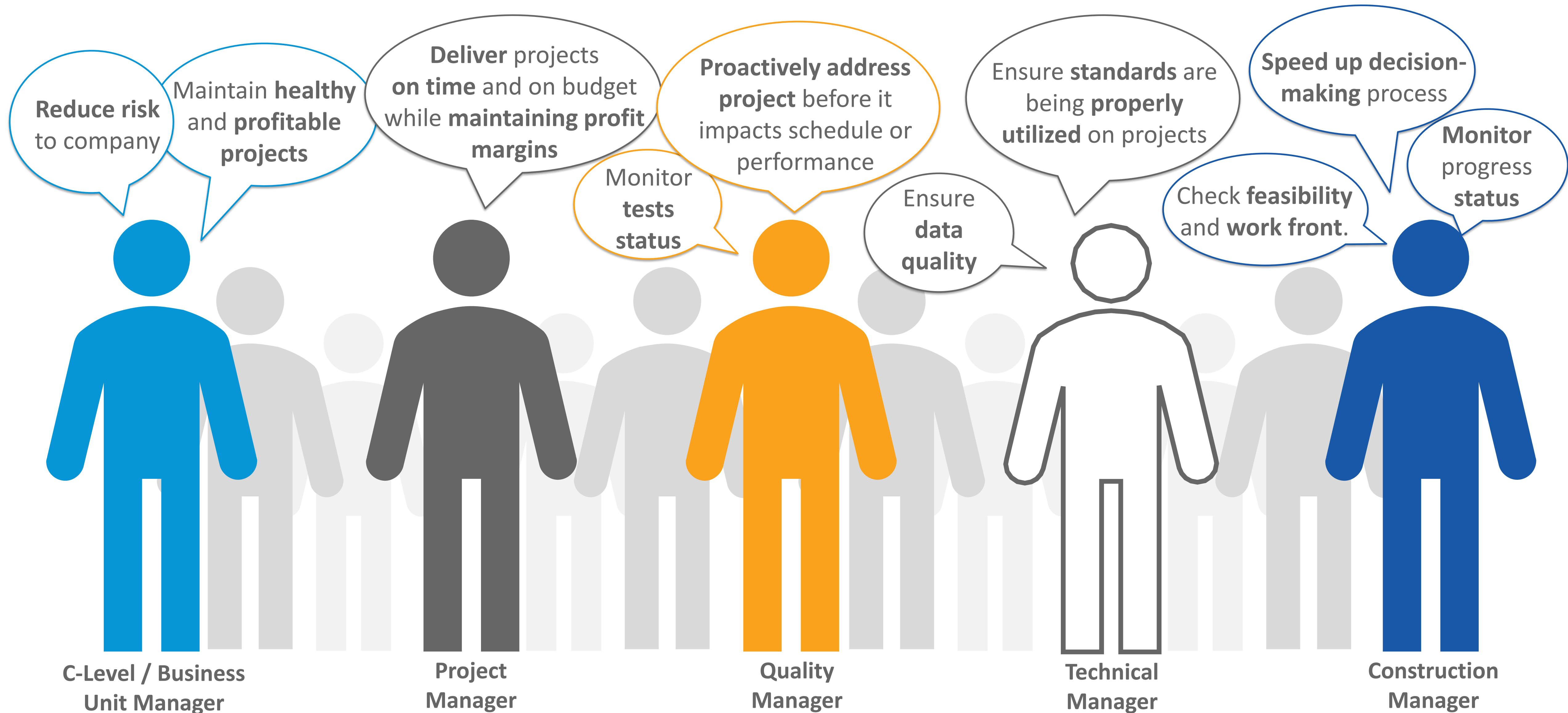
Project Configuration

Enhanced access control

Value to Stakeholders



Value to Stakeholders



User Voice





“Now **data** is truly **driving the Business**”

Business Unit Manager

“With the new reporting I can take **better choices** in **less time**”

Technical Manager

“Millions documents...**just a click away**”

Quality Manager

“Two words: **powerful and useful** ”

Construction System Manager

“Visual representation **simplifies feasibility analysis**”

Construction Manager

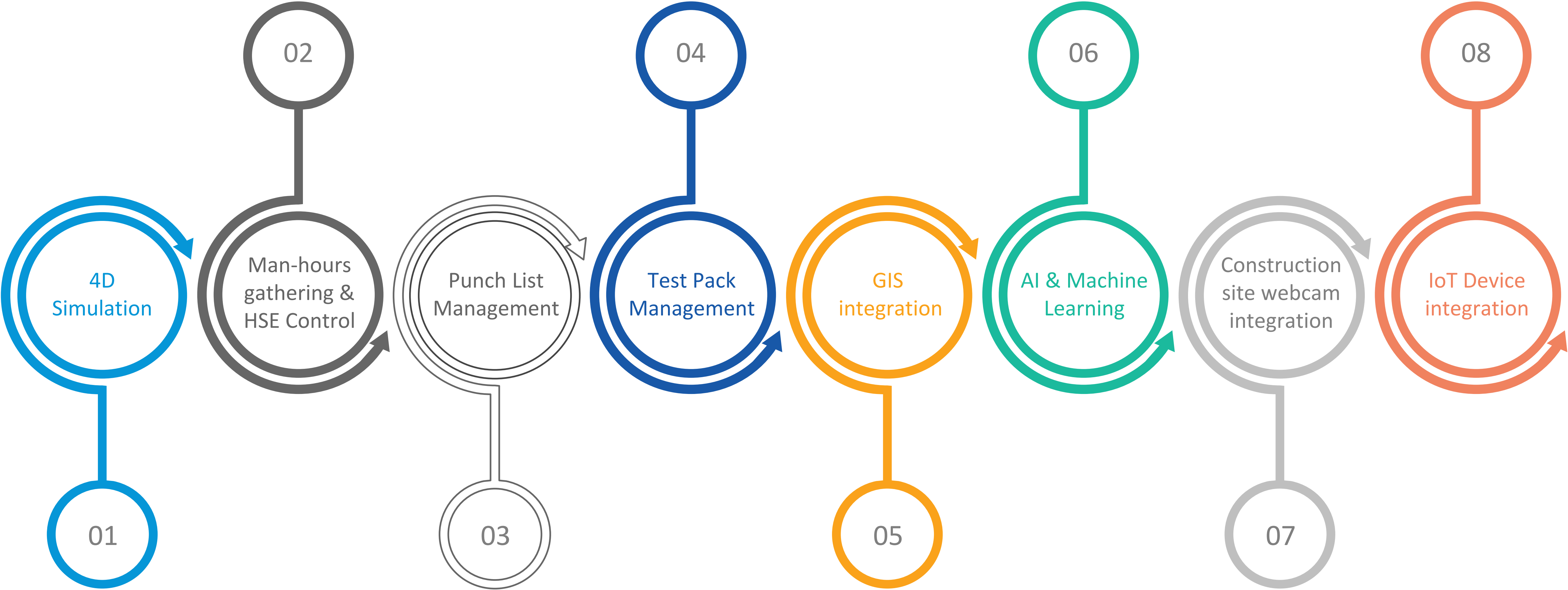
“Models contains a lot of **useful information** that is always **up to date**”

Project Manager

Future



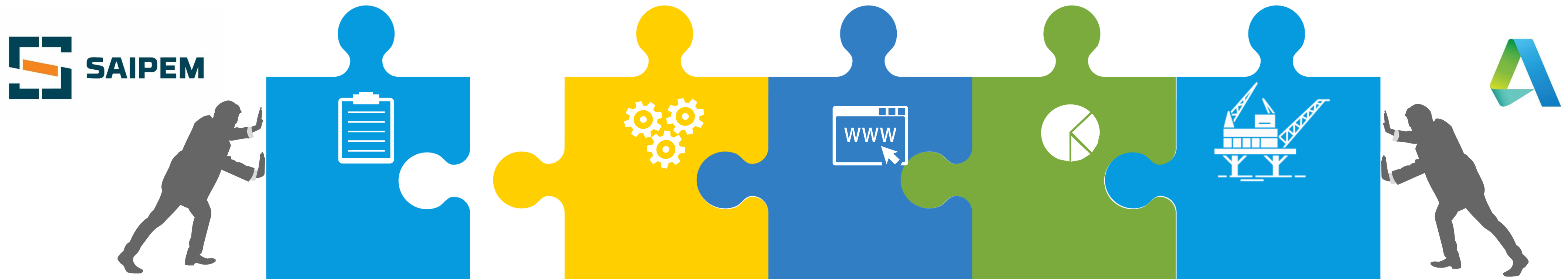
Next Steps



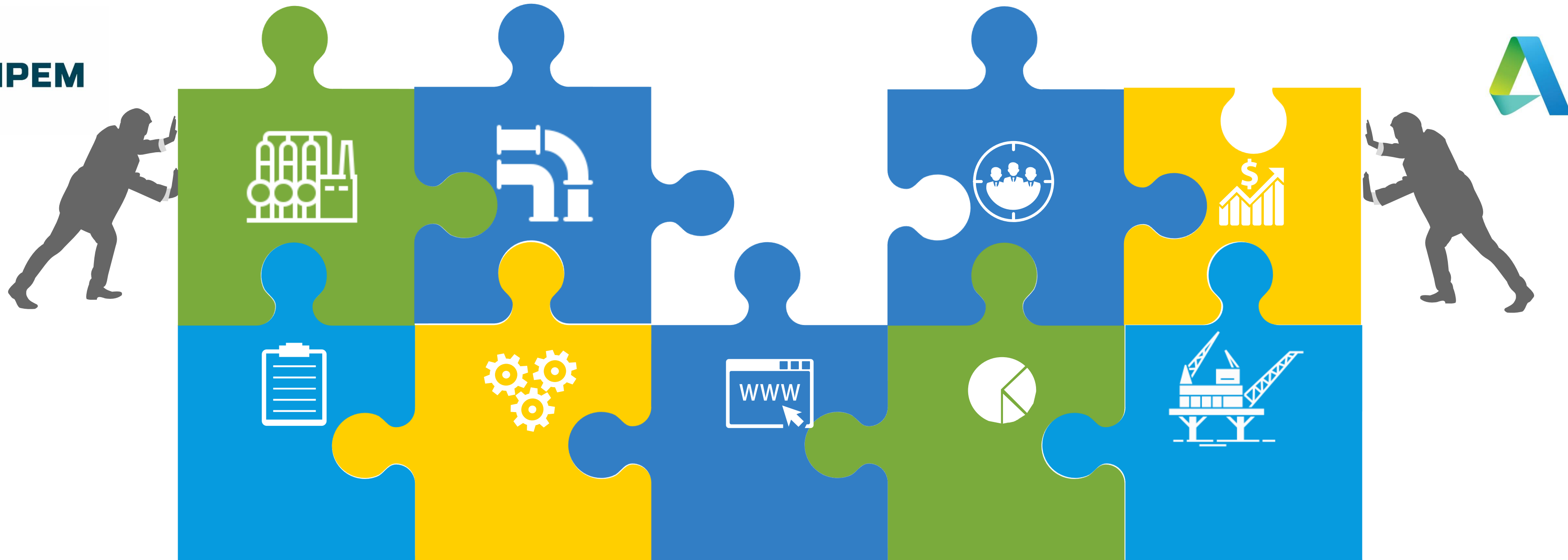
Summary



Autodesk University 2018



Autodesk University 2019



Autodesk University 2020



we know the way...we just want to make it
better...





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