Web data editor: Forging MEP design specifications with Forge

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RAMBOLL

FORGE DEVCON

AUTODESK UNIVERSITY

About the speaker

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INTRO TO FORGE

FORGE

Intro to Forge - Platform

- The Forge platform unlocks the power of design and engineering data so you can connect teams, workflows, and build new services to address today's connected customer.

Status on Forge: https://forge.autodesk.com/
November 2019

Viewer

Render 3D and 2D model data within a browser. The models can come from a wide range of applications such as AutoCAD, Fusion 360, Revit, and many more.

- Introduction
- View Documentation

Data Management API

Access data across BIM 360 team, Fusion Team, BIM 360 Docs, and the Object Storage Service to build apps to display and extend your data in ways that add value to your users.

- Introduction
- View Documentation

Model Derivative API

Derive outputs viewable by the For Viewer from more than 60 CAD file formats, and extract metadata abo the models as well as the individua objects within the model.

- Introduction
- View Documentation

Authentication

Generate tokens based on the OAuth 2.0 standard to authenticate requests made to Forge APIs and SDKs.

- View Documentation

Webhooks API

Subscribe to and receive notifications of the occurrence of events within the Forge eco system.

- Introduction
- View Documentation

Design Automation API

Automate repetitive tasks by leveraging on the scale of the Forge Platform and running scripts on your design files in the cloud.

- Introduction
- View Documentation

Reality Capture API

Convert digital images into high resolution textured meshes, dense point clouds and orthophotos.

- Introduction
- View Documentation

BIM 360 API

Integrate with the Autodesk BIM 360 platform to extend its capabilities to reach segments of the construction ecosystem that don't have direct access to BIM data

- Introduction
- View Documentation

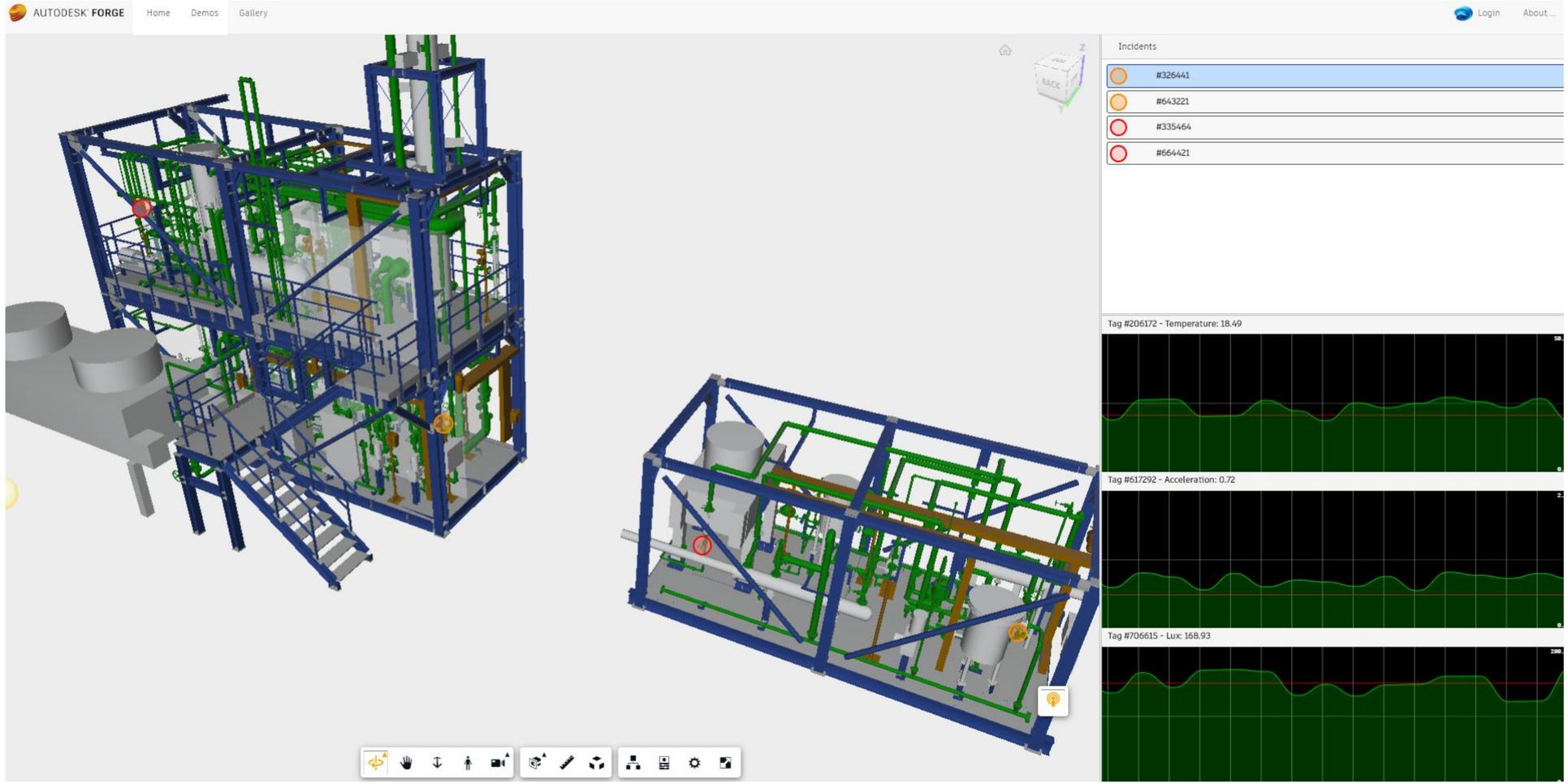
Token Flex API

Access Autodesk Token Flex Usage Data platform to generate reports on consumption, usage, and contract details.

- View Documentation

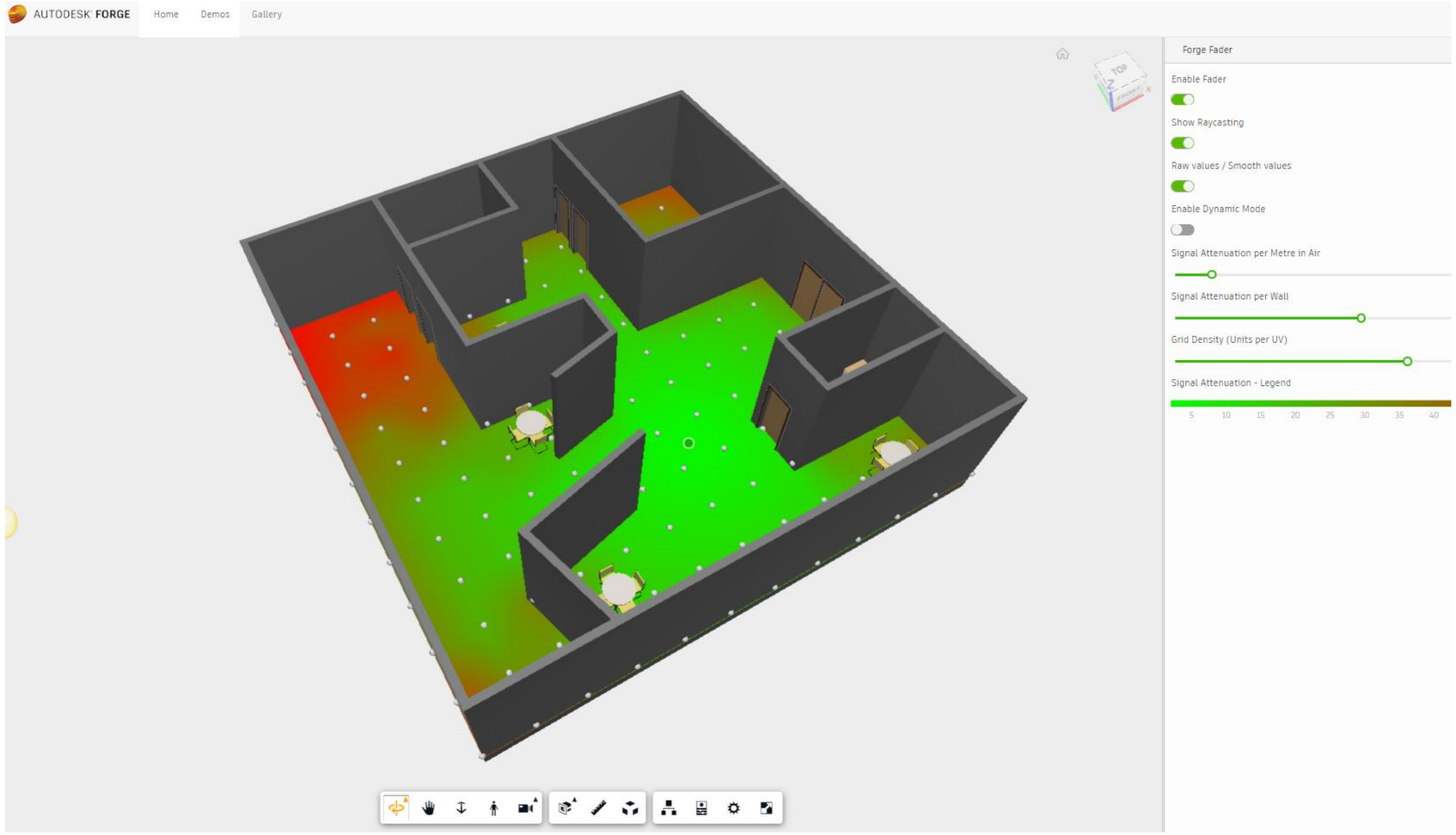
Forge Dev. Examples: MEP Digital Twin

https://forge-rcdb.autodesk.io/configurator?id=58adee163e6f342cf1e92dae



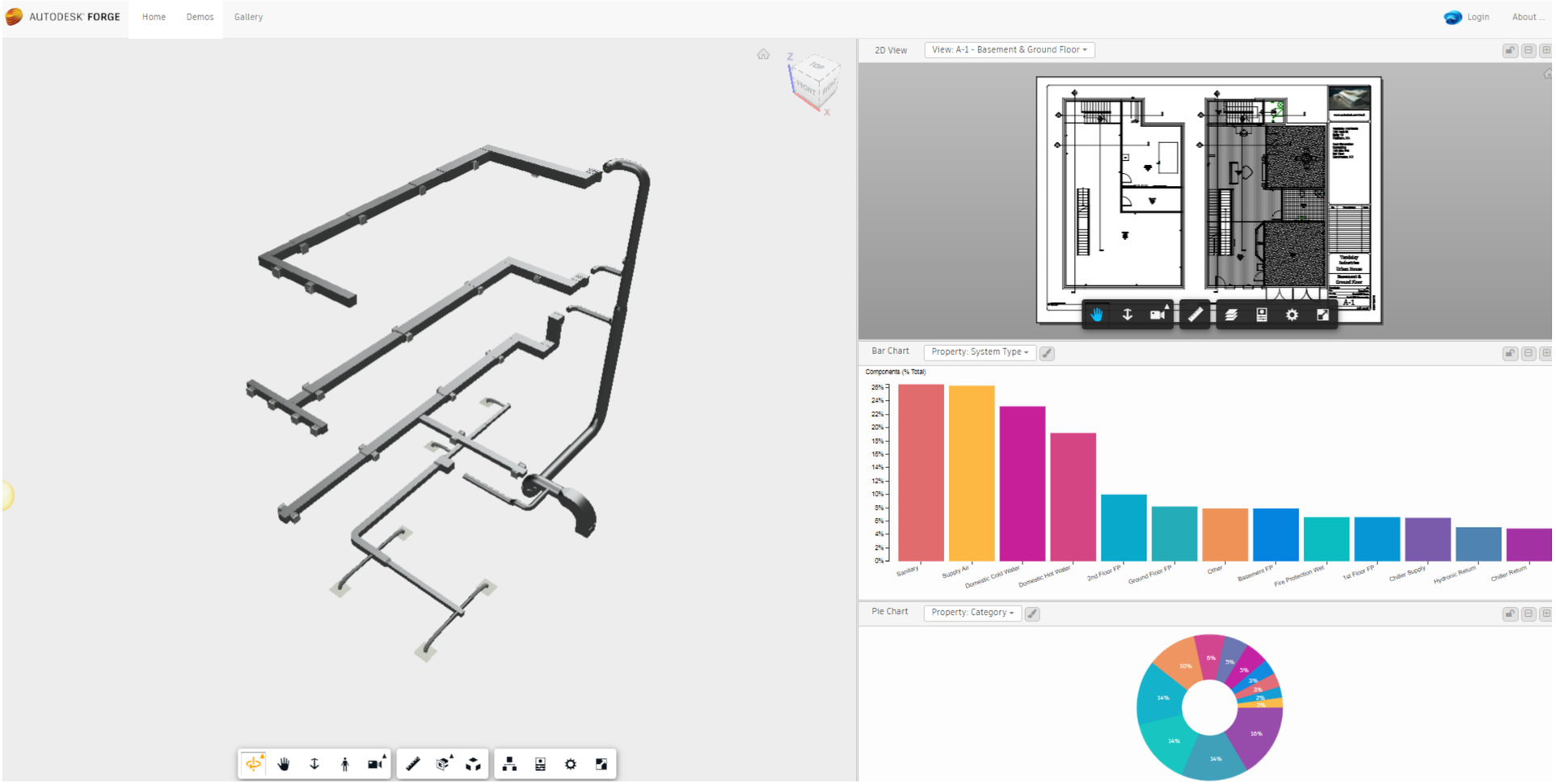
Forge Dev. Examples: Wifi Design Analysis

https://forge-rcdb.autodesk.io/configurator?id=59041f250007f5c0eef482f2



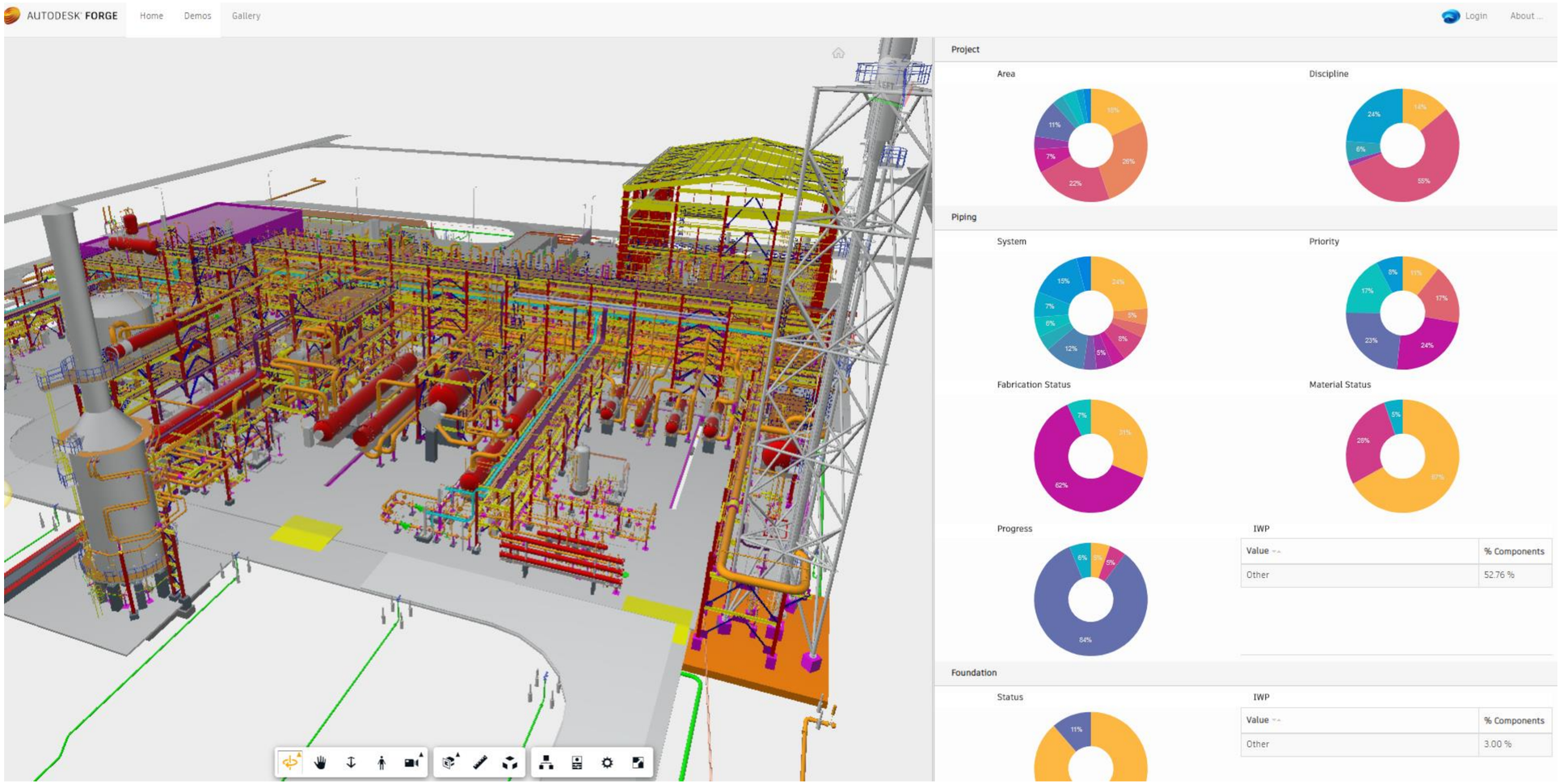
Forge Dev. Examples: MEP Design Viewer

https://forge-rcdb.autodesk.io/configurator?id=57f3739777c879f48ad54a44



Forge Dev. Examples: MEP Construction Status

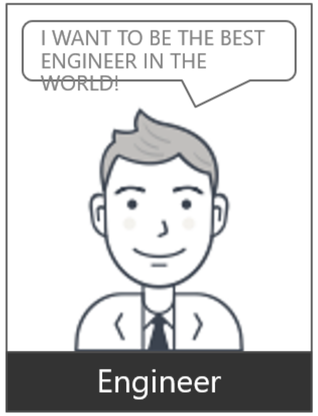
https://forge-rcdb.autodesk.io/configurator?id=58cac141597e53832268b88e



WEB DATA EDITOR DEVELOPMENT PROCESS

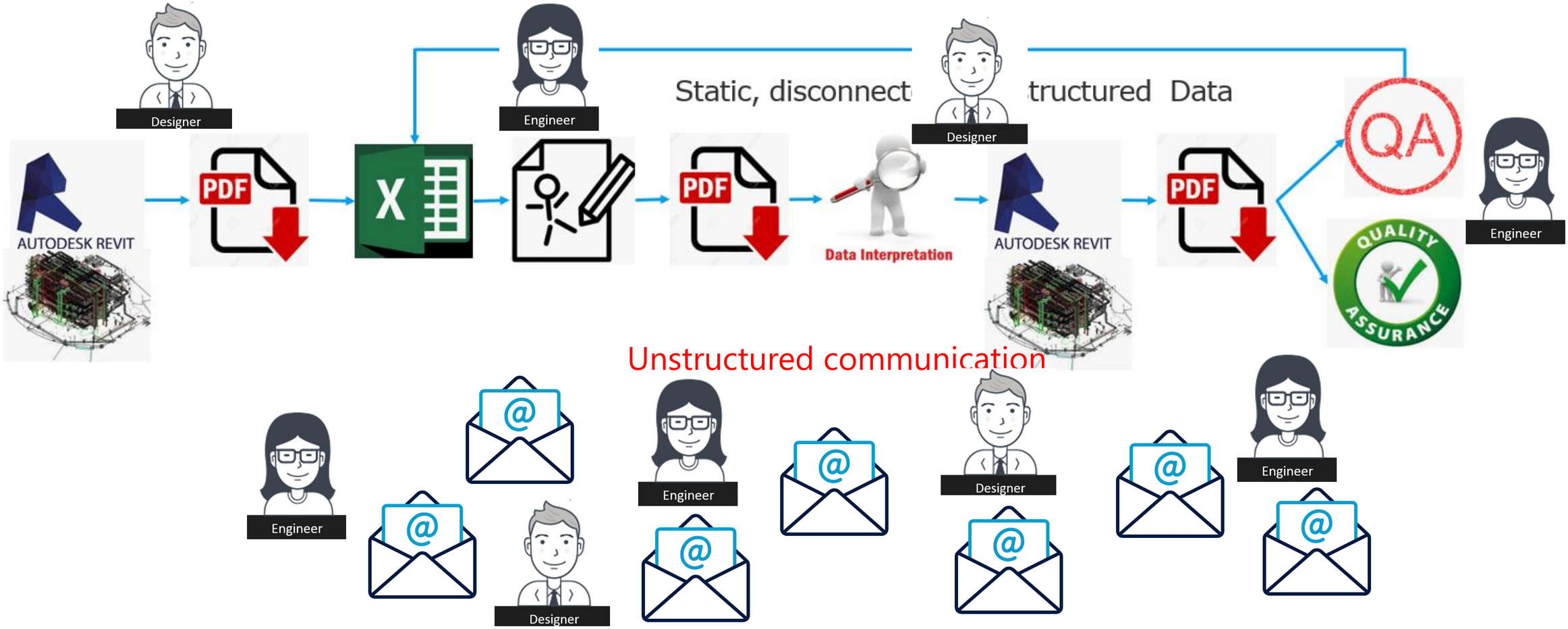
We help our engineers and designers by Automating MEP specification process:

1. Provide Ramboll a **web application for engineers to work with data** in BIM models and diagram **wit basis or none Revit skills**
2. Provide **engineers the ability to extend information** of a model within the **same ecosystem than designers**
3. Provide **designers the possibility to receive** the extended **information from** the **engineers within** the **same platform**
4. **Enhance the communication process** between engineers and designers
5. **Easy to use and small scope** : Just Automation of “Anlægsliste”



THE PROBLEM

Engineers love to work with unstructured data in excel and disconnected from BIM models



Inspiration To Solve The Problem

Signify Philips Lighting Designer

Who

Xinaps

Geert van Gorp
Antoine Meurillon
Frank Schuyer
Hans de Kruijff

Solution

Supported RVT files are displayed from BIM 360 using the Data Management API. The model is then converted and loaded into a Unity webgl viewer. Using the BIMobject API a list of products is provided and the RFA is converted to a Unity viewable lighting object using Design Automation for Revit and the Model Derivative API.

After placement a calculation for the fixtures per room using clashing \ energy demand \ lux per room is completed and a bill of quantities is generated. The lighting fixtures are then integrated back into the Revit file by pushing the RFA from BIMobject, the added locations from our web viewer and the base Revit file to Design Automation for Revit.

The newly generated Revit file is saved as a new file version to BIM 360 using the Data Management API.

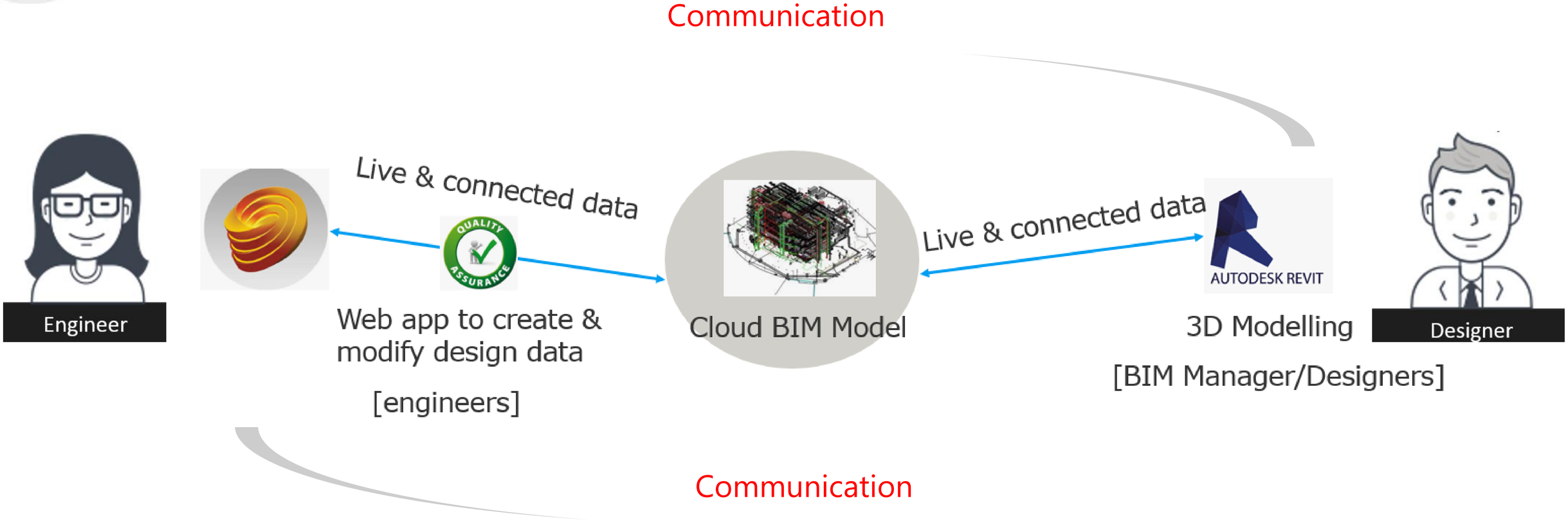
Xinaps

APIs Used:

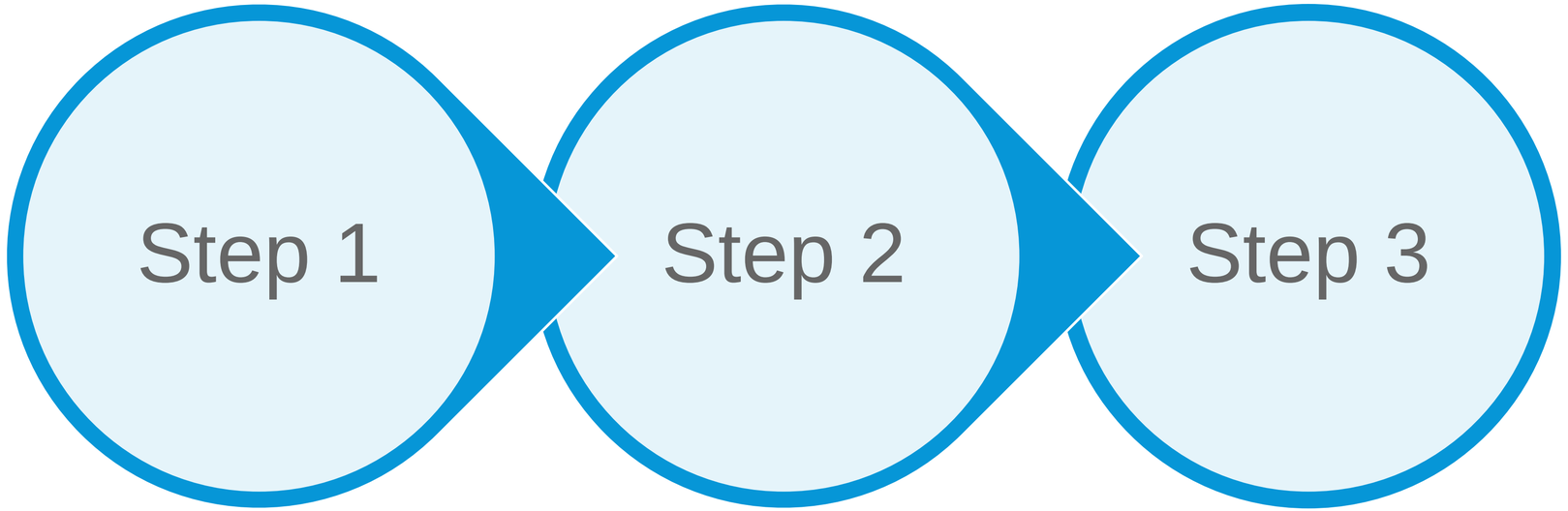
Design Automation
Viewer
Data Management
Model Derivative

INTRODUCING - ramboll web data editor

Rambøll web data editor is a platform that enables engineers to read and modify data from the browser



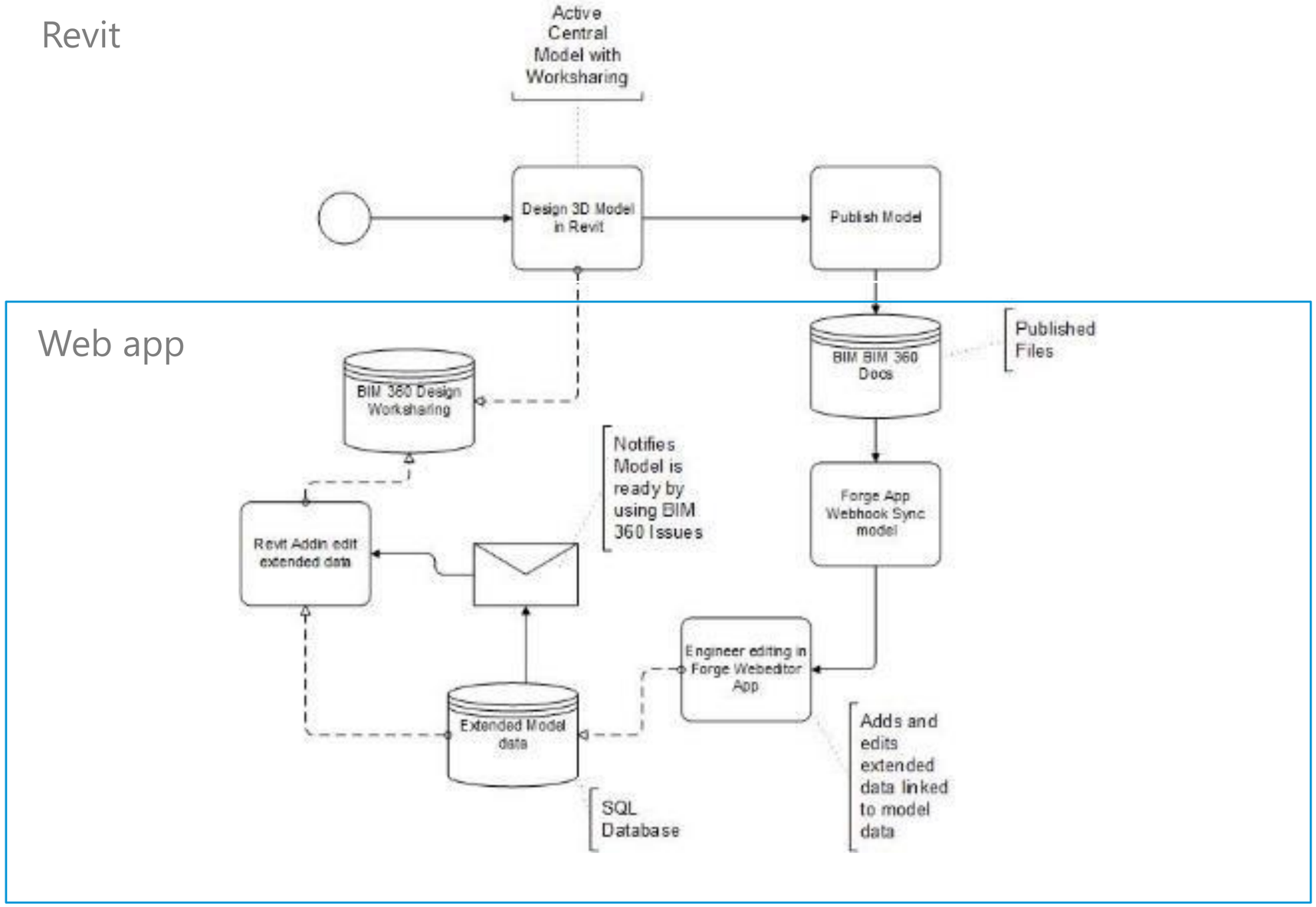
Forge app: It works like this



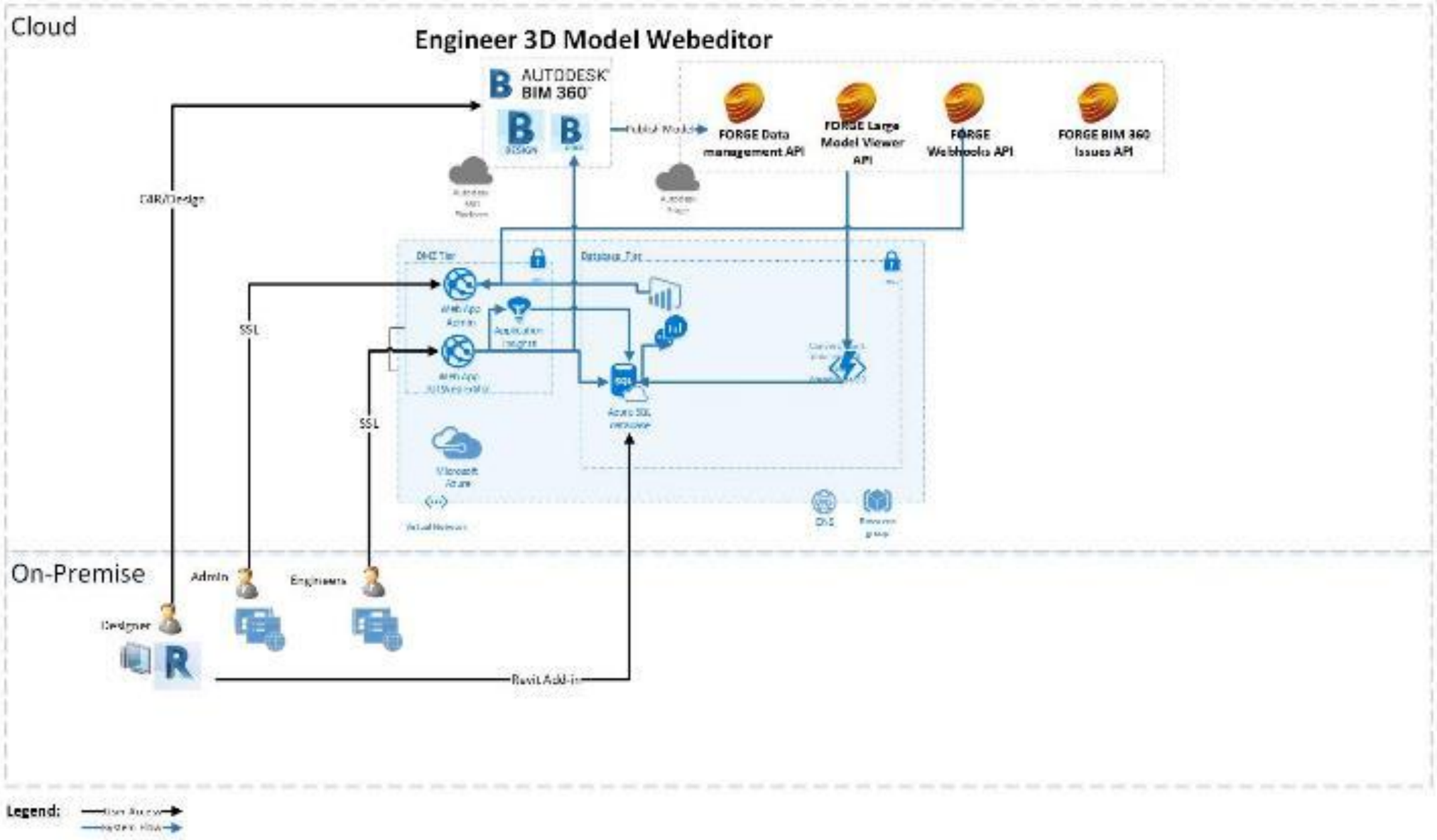
- Model auto publish to BIM360 docs
- Engineer adds data and specifications in web application
- Designer synchronizes only wished data to Revit model via plugin

WEB DATA EDITOR: FORGE TECHNOLOGIES & DATA ARCHITECTURE

Technical - business process



Technical - DATA ARCHITECTURE



Technical – technology components

- Autodesk
  - Forge App for Web viewer
  - Forge App for Forge App for sync webhook
  - BIM 360 Revit Design Work-sharing
  - BIM 360 Docs
  - Revit 2019
  - Revit Add-in
- Microsoft
  - Azure WebApp
  - Azure SQL Database
  - Azure Application Insights
  - Azure Log Anlytics
  - Power BI

WEB DATA EDITOR: MOCKUP DEMO

Engineer 3D Model Webeditor

http://webeditor.ramboll.com

RAMBOLL Webeditor

Sign in

Email

name@example.com

NEXT

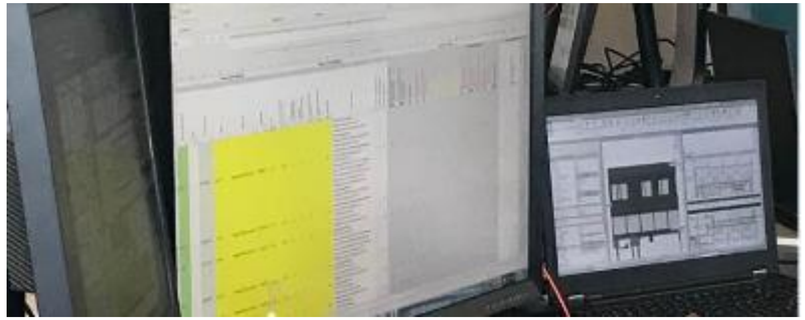
NEW TO AUTODESK? CREATE ACCOUNT

WEB DATA EDITOR: WRAP UP

BUSINESS CASE – SAVING POTENTIAL

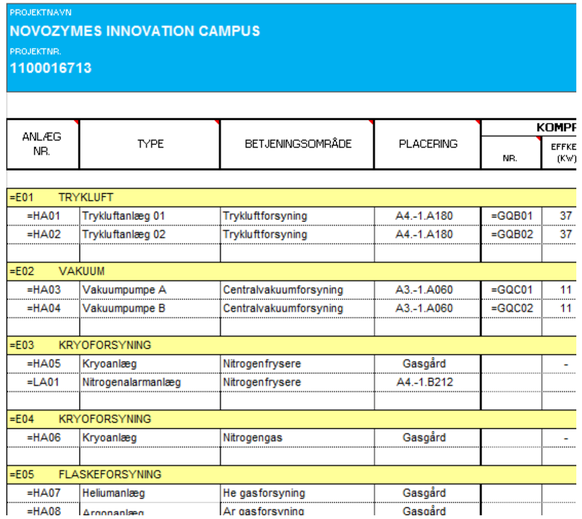
- “MEP Component List” automation from **60 hours to 10 hours -> 80% time saving in this task**
- This web app **enables a better culture to work with structured data**

FROM BIM MODEL → TO EXCEL SHEET → TO PDF SOFTWARE → TO PDF



COORDINATION OF “ANLÆGSLISTE” IN PAPER AND PDF SOFTWARE WITHOUT BIM MODEL

CREATION OF “ANLÆGSLISTE” IN EXCEL WITHOUT BIM MODEL

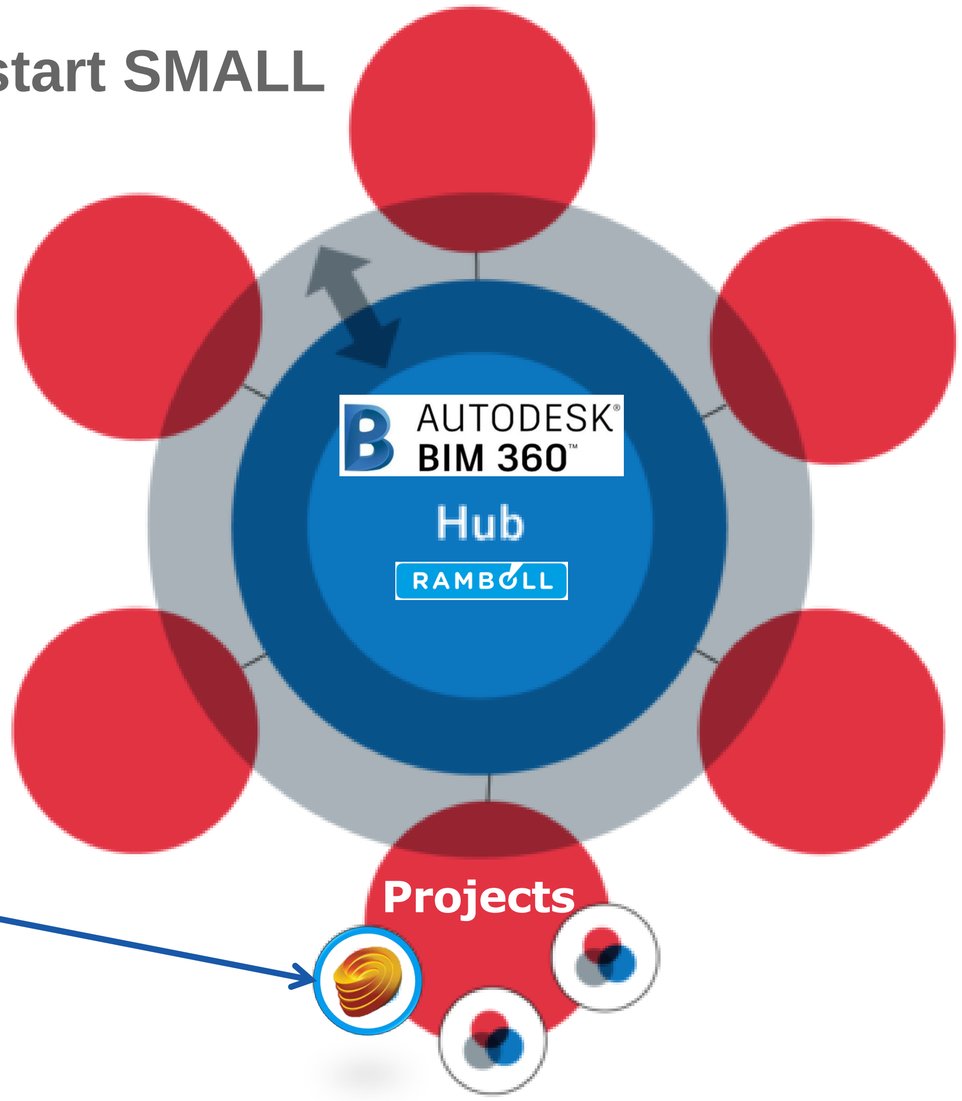


PROJEKTNAVN
NOVOZYMES INNOVATION CAMPUS
PROJEKTNR.
1100016713

ANLÆG NR.	TYPE	BETJENINGSOMRÅDE	PLACERING	KOMPF NR.	EFFKE (KW)
=E01	TRYKLUFT				
=HA01	Trykluftanlæg 01	Trykluftforsyning	A4.-1.A180	=GQB01	37
=HA02	Trykluftanlæg 02	Trykluftforsyning	A4.-1.A180	=GQB02	37
=E02	VAKUUM				
=HA03	Vakuumpumpe A	Centralvakuumforsyning	A3.-1.A060	=GQC01	11
=HA04	Vakuumpumpe B	Centralvakuumforsyning	A3.-1.A060	=GQC02	11
=E03	KRYOFORSYNING				
=HA05	Kryoanlæg	Nitrogenfrysere	Gasgård		-
=LA01	Nitrogenalarmanlæg	Nitrogenfrysere	A4.-1.B212		
=E04	KRYOFORSYNING				
=HA06	Kryoanlæg	Nitrogengas	Gasgård		-
=E05	FLASKEFORSYNING				
=HA07	Heliumanlæg	He gasforsyning	Gasgård		
=HA08	Argonanlæg	Ar gasforsyning	Gasgård		

VISION – FORGE ECOSYSTEM FOR SCALE

- Forge Success Stories: **Think BIG, start SMALL**



Web Data Editor

QUESTIONS?

Alejandro Mata | IDS – Integrated Digital Solutions

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RAMBOLL Bright ideas. Sustainable change.

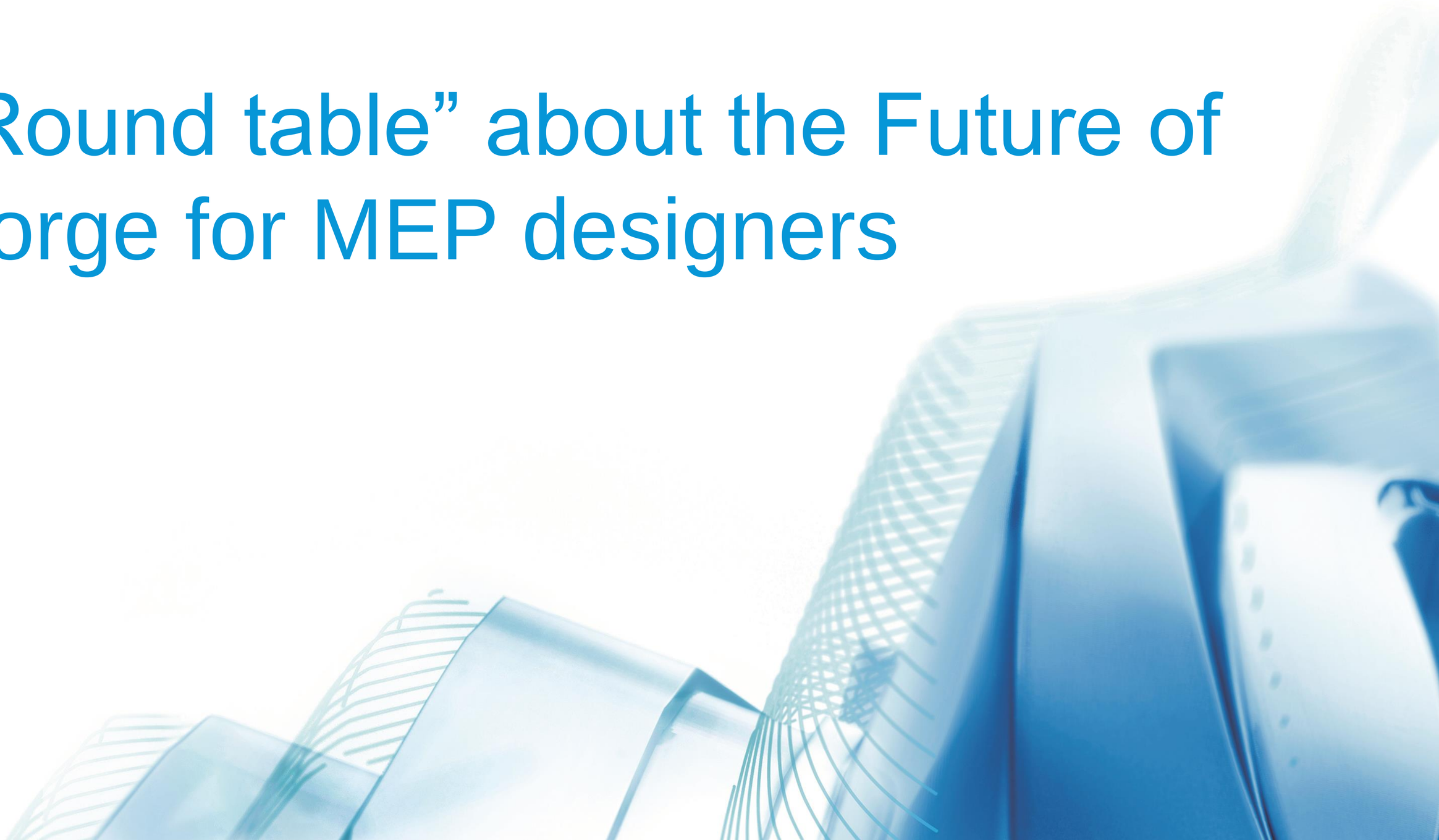
Forge app: Web Data Editor for MEP components list

Questions?

Alejandro Mata – Ramboll – almat@ramboll.dk

RAMBOLL

“Round table” about the Future of Forge for MEP designers



DISCUSSION 1 - DATA

- What are your main challenges working with data?
- What are your expectation for future data requirements demands from clients?
- Are you utilizing your model data for automation of design processes?
- How Forge can help to solve MEP data challenges?

DISCUSSION 1 - PEOPLE

- What are your main challenges with people and implementation of digital tools?
- What is the level of digital skills in your organization?
- How do you see Forge to facilitate collaboration between different project stakeholders without depending on for example Revit skills?
- How do you see Forge potential to scale optimized data-driven processes in your organization?

Thanks for your attention!

Any other questions?

- Alejandro Mata – Ramboll – almat@ramboll.dk

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