Web data editor: Forging MEP design specifications with Forge

Alejandro Mata
Automation Manager – Ramboll – almat@ramboll.dk
About the speaker

Alejandro Mata
Automation Manager – Rambøll Denmark
Integrated Digital Solutions Department
MSc. Civil Engineering | HVAC
Automation, Digitalization and Digital design development
with focus on Buildings and energy design
INTRO TO FORGE
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 Fo Viewer from more than 60 CAD file formats, and extract metadata that the models as well as the individual 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](#)
- [View Documentation](#)

**Webhooks API**
Subscribe to and receive notifications of the occurrence of events within the Forge ecosystem.
- [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 Maurillon

Frank Schuyer
Hans de Kruif

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.

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

- **Step 1**
  - Model auto publish to BIM360 docs

- **Step 2**
  - Engineer adds data and specifications in web application

- **Step 3**
  - Designer synchronizes only wished data to Revit model via plugin
WEB DATA EDITOR: FORGE TECHNOLOGIES & DATA ARCHITECTURE
Technical - business process

Revit

Web app
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 Analytics
  - Power BI
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
VISION – FORGE ECOSYSTEM FOR SCALE

- Forge Success Stories: Think BIG, start SMALL
QUESTIONS?

Alejandro Mata | IDS – Integrated Digital Solutions
almart@ramboll.dk
Forge app: Web Data Editor for MEP components list

Questions?

Alejandro Mata – Ramboll – almat@ramboll.dk
“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