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Technical Consultant Autodesk

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## What is BIM 360 and Forge

What has been done

What can you do



## Forge

Forge takes components from Autodesk's powerful library of software and delivers them as cloud-based building blocks for companies to create their own new solutions.







Construction Enterprise Integration & Insight (IQ)

Design Collaboration



VDC / BIM Management











Planning & Scheduling



Layout & Verification



Field Management



Building Operations



Common Data Environment (CDE)

#### Foundation Services







Big Data Platform



Object Store



Transfer Avoidance



Service Message Bus















Event Services













































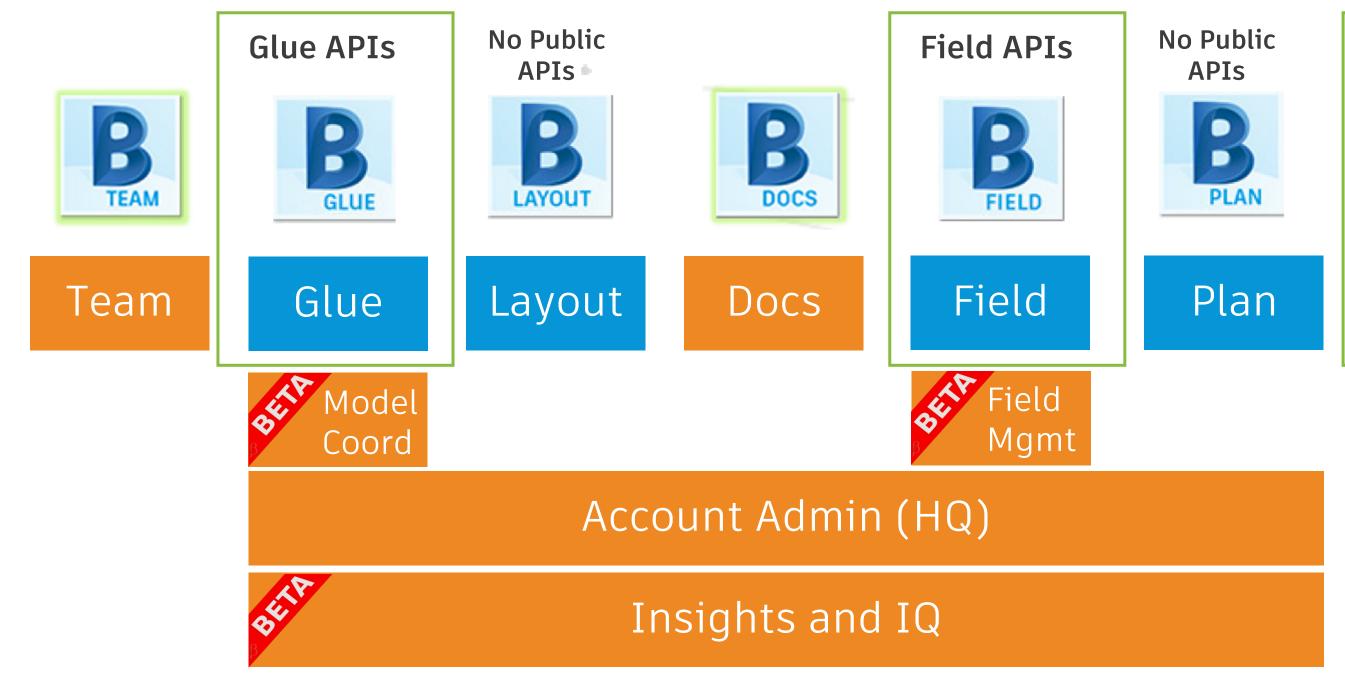
## BIM 360 Family vs. Forge\*

Forge

Not Forge

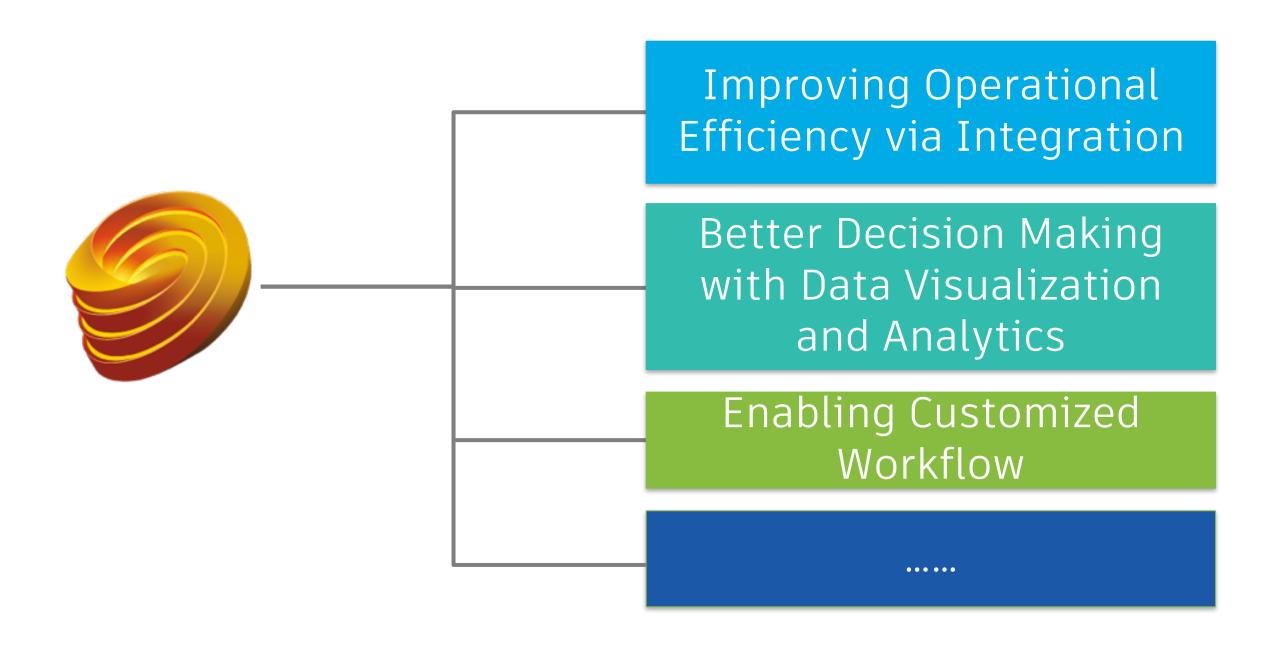
**Ops APIs** 

Ops



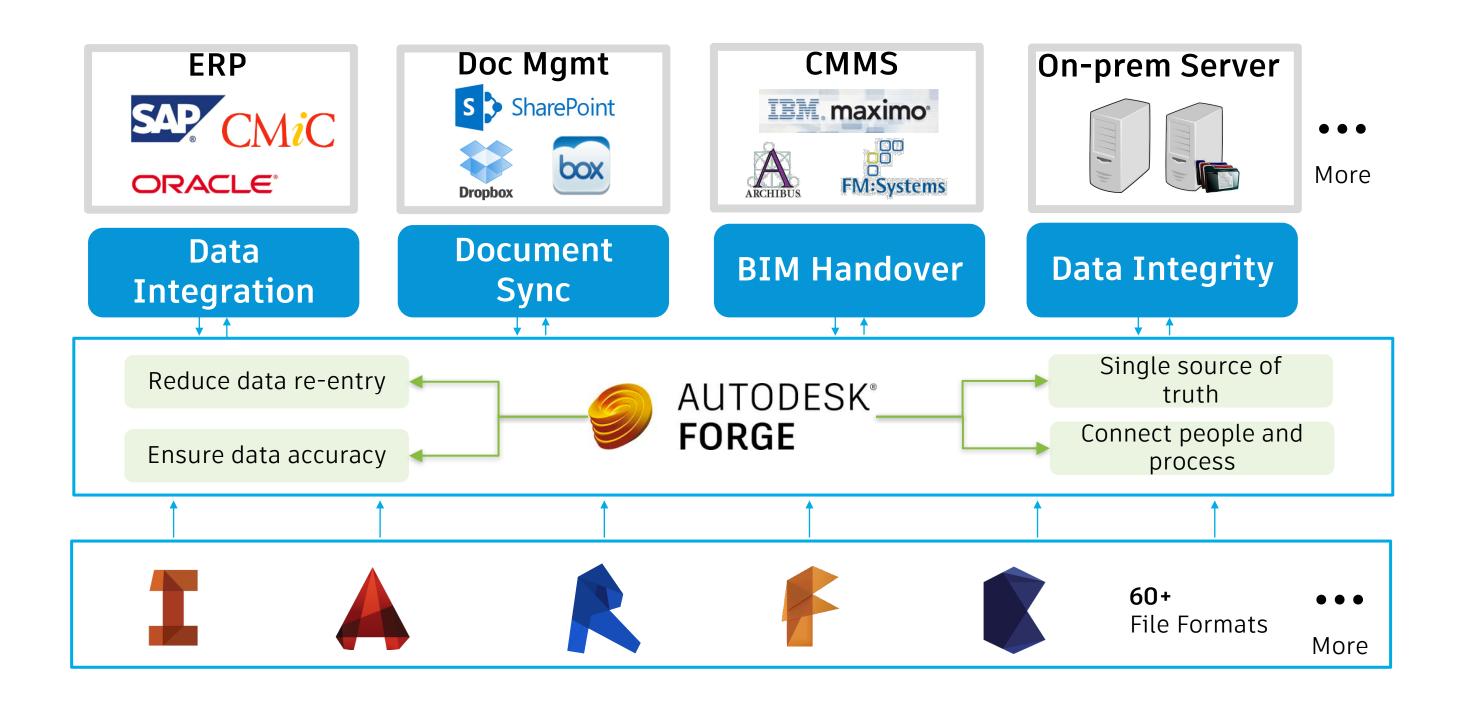


## **Enterprise Objectives**



# Integration

## Improving Operational Efficiency via Integration





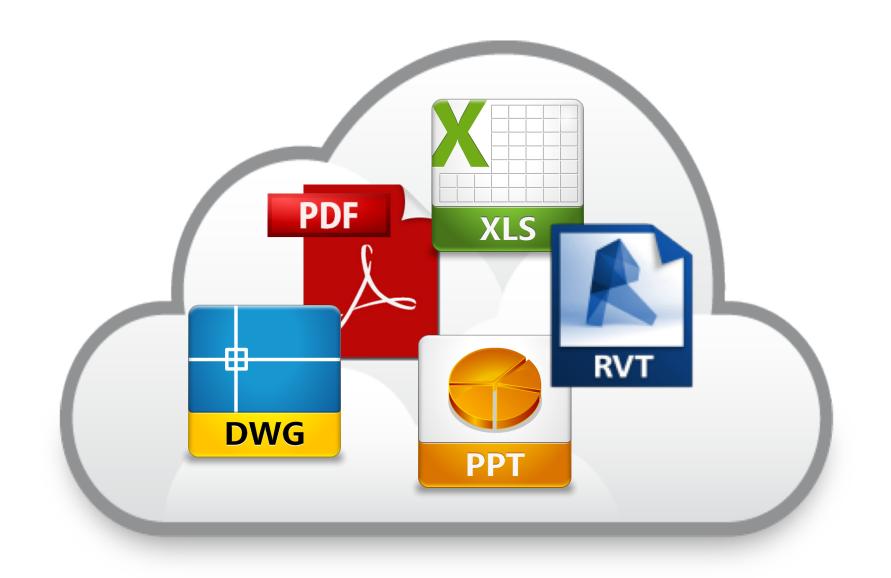
Senior Analyst Southland Industries Who is Southland Industries?

- Building solutions provider
  - Design engineering
  - Fabrication
  - Construction
  - Building service



## Why Are We Moving to the Cloud?

- Access to information
  - Accurate
  - Available anywhere
  - Clear
- Efficiency
  - IT infrastructure
  - Replication



## Why Use Forge?

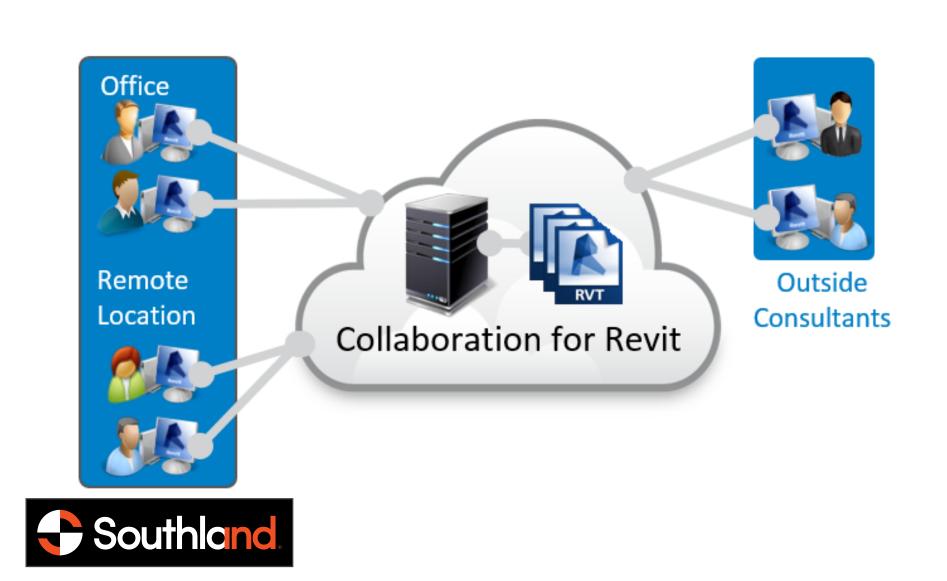
- Strategic vision
- Integrations
- Readily available API
- Partnership with Autodesk
- Custom applications
  - Collaboration for Revit backup utility





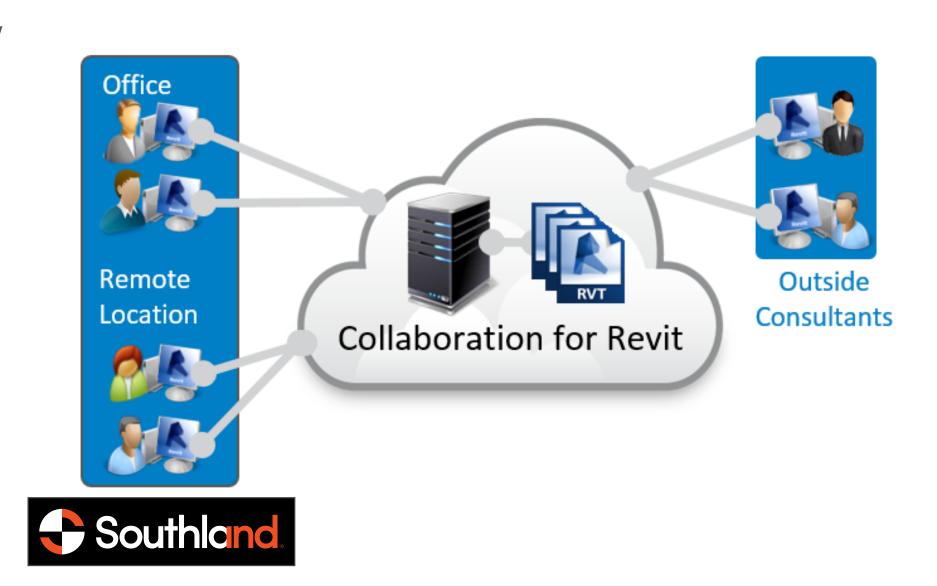
## Why Collaboration for Revit?

- Enables collaboration
  - Remote employees
  - Outside consultants
- No on-premise servers
- Eliminates replication lag

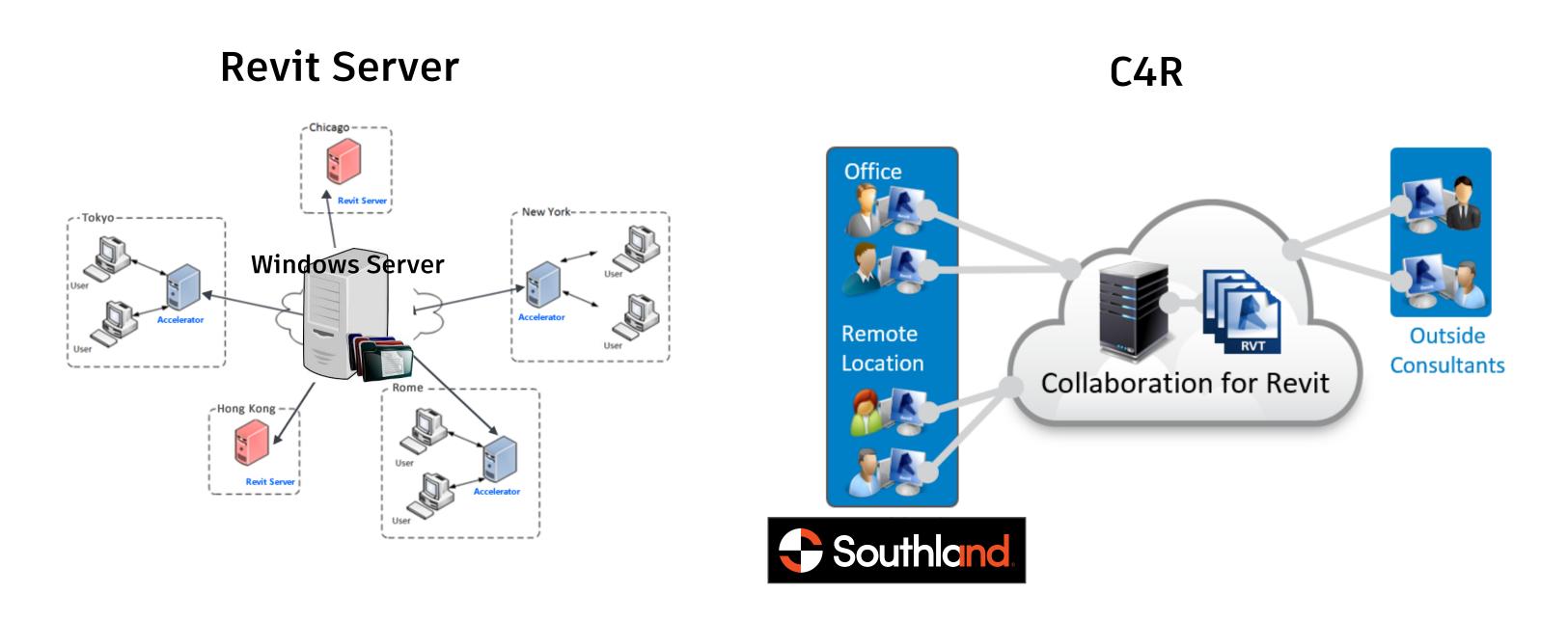


## Why Build a Backup Utility for the Cloud?

- Document retention policy
  - 10 years
  - All documents archived
- File backup restoration
  - High trust environment
  - Lost work
  - Corruption



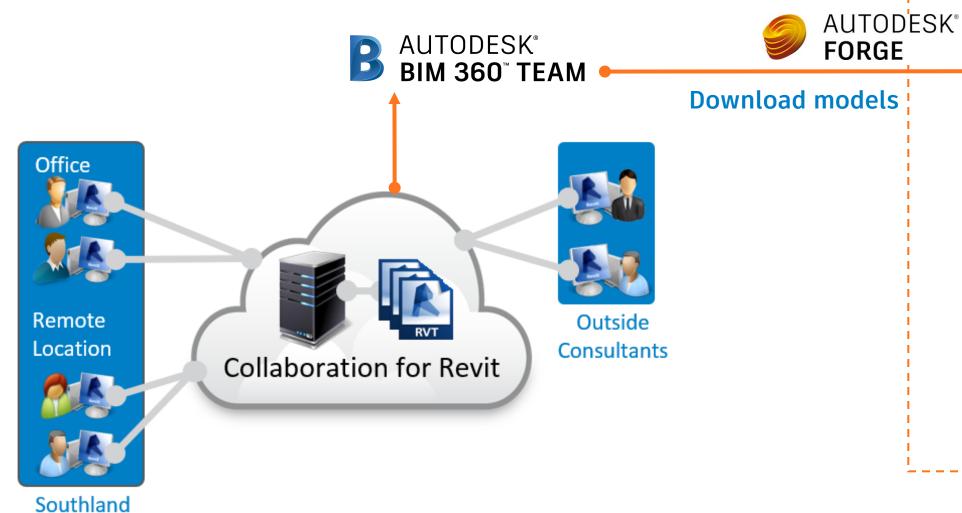
# Revit Server to Collaboration for Revit (C4R) The gap of backing up models locally

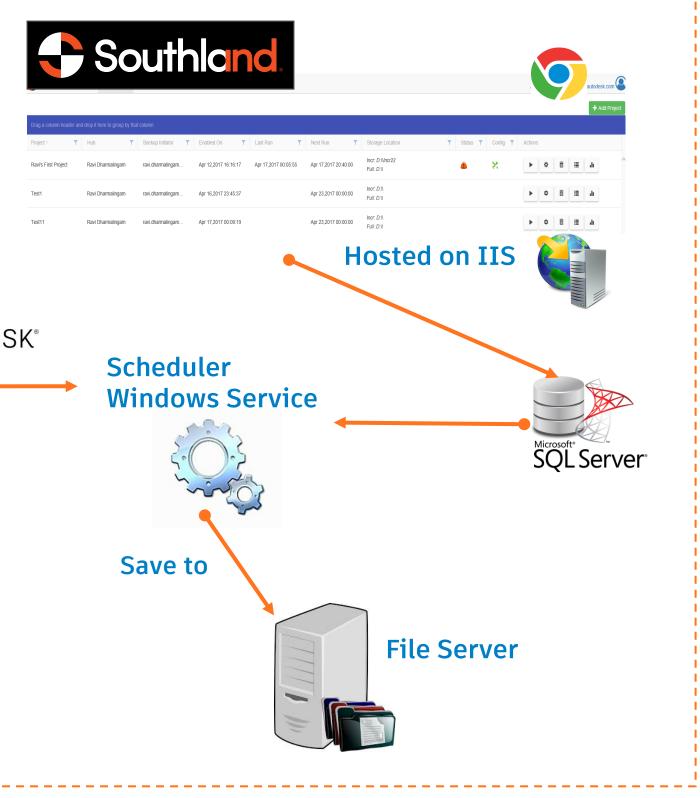


## The Solution

Industries

- Web app using Forge APIs
- Custom backup schedule, mapped to server
- Scalable to any Forge-based products





## Why Autodesk Consulting?

- Enterprise Business Agreement
- Great relationship
- Collaborated on other applications
- Leverage expertise





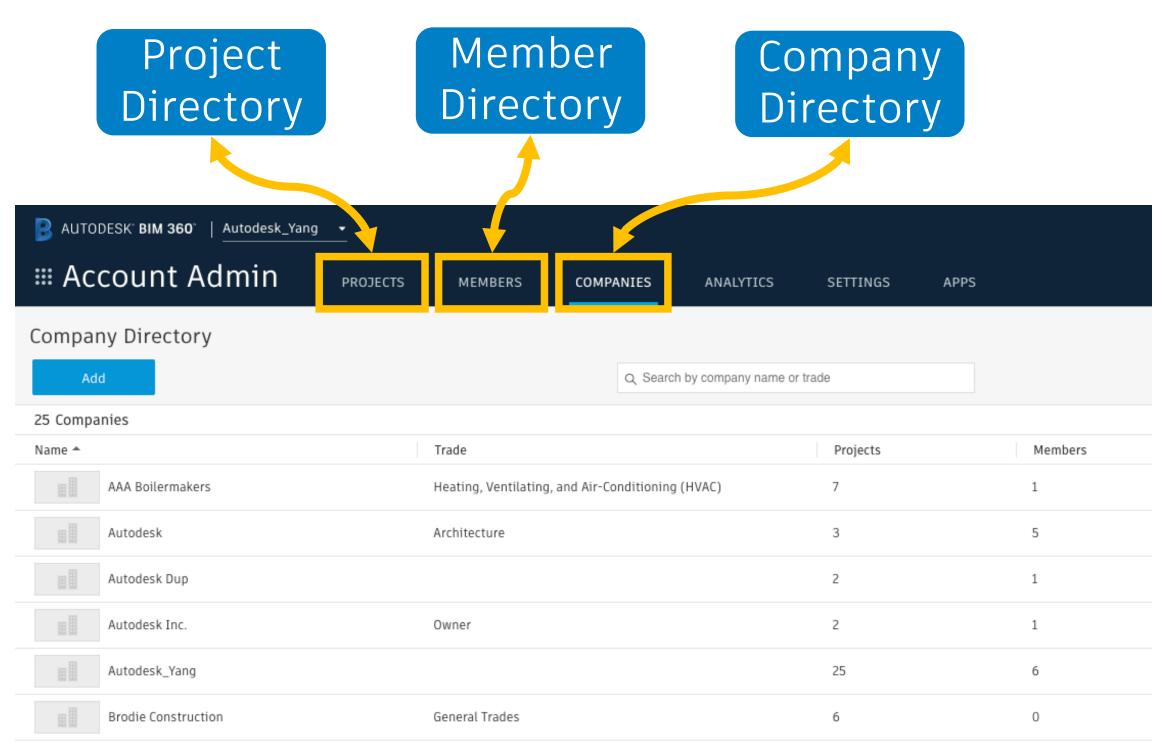
### What was the Process?

- Project Management Office (PMO) for technology project governance
  - Ensures new technologies bring value to the business
  - 5 phases:
    - Demand
    - Analysis
    - Design
    - Build
    - Implement

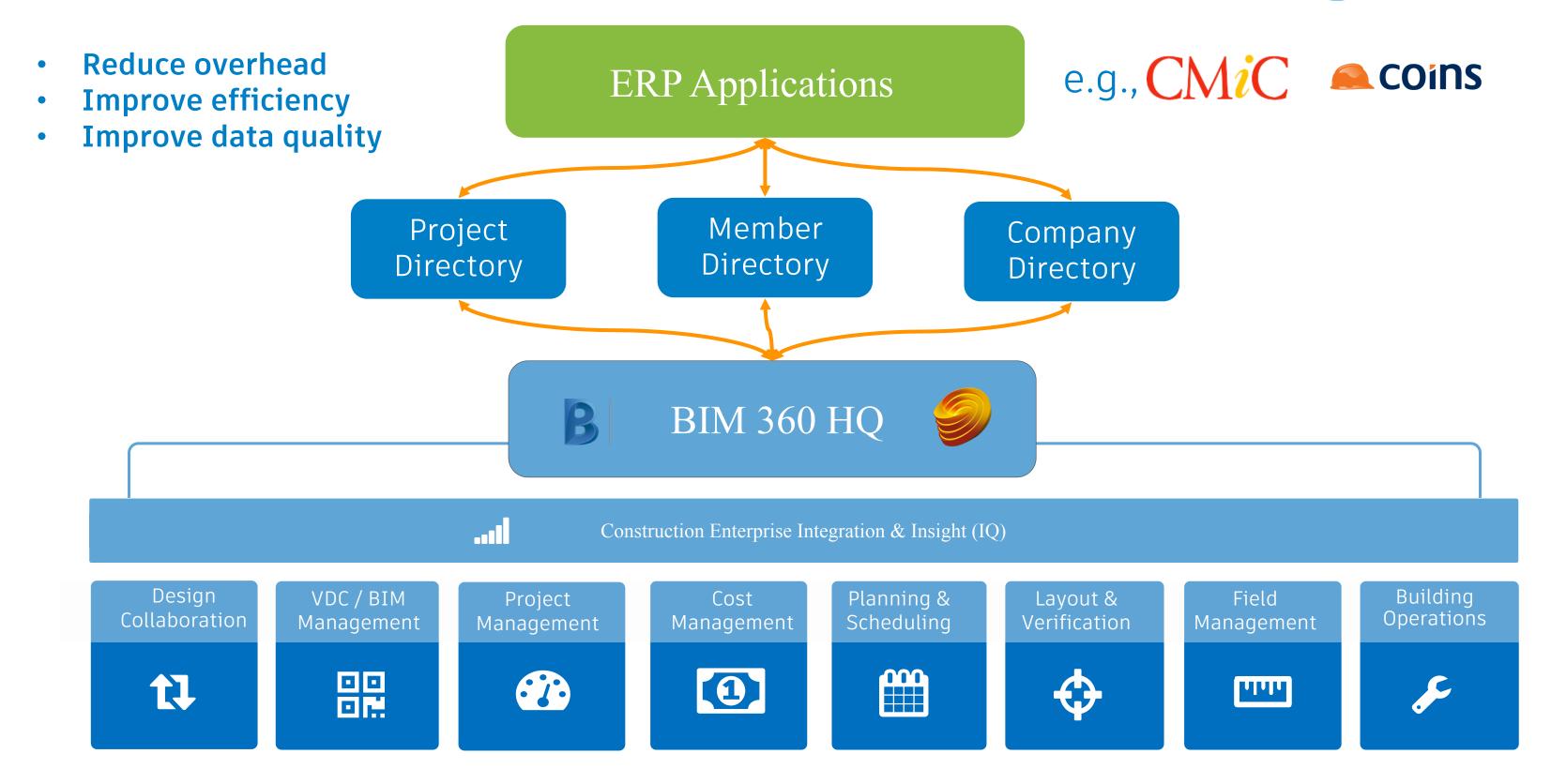
## BIM 360 Account Admin (HQ) + ERP integration

#### **Basic HQ Features:**

- Create Project
- Activate Service
- Add Project Admin
- Master Member Directory
- Master Company Directory



## BIM 360 Account Admin (HQ) + ERP integration



## BIM 360 Account Admin (HQ) + ERP integration



## CS125145 - Using BIM 360 APIs—a Case Story of Layton Construction

In this session, Jeff Metcalf, CIO from Layton Construction will be presenting how Layton, Forge and other Cloud Service APIs have been leveraged in order to integrate with CMiC, an internal ERP system, to reduce overhead and increase visibility into Key Performance Indicators across many projects using Autodesk Cloud Services including BIM360 (HQ) and BIM360 Field. (Joint AU/Forge DevCon class).

#### Speakers



#### Jeff Metcalf

Information Systems Director Layton Construction

Jeff Metcalf is the Director of Information Systems at Layton Construction. He has been with the company for 17 years, 3 in his current position and as a Controller prior to that. He manages the ERP system, overseeing and directing development and implementation of new functionality along with training and instructing. He also leads a team of VDC professionals. Jeff holds a BS in accounting and an MBA. He is an adjunct professor at the BYU school of technology in the Facilities and Construction Management Master's program.



Keith White

Technical Consultant Autodesk Inc

Keith White is an experienced architect and software developer with over 20 years of experience in building design and construction, and a passion for Building Information Modeling (BIM). Currently, Keith is a technical consultant with Autodesk Consulting, developing solutions for customers in AutoCAD, Revit and Navisworks desktop software and Autodesk cloud services such as Glue, Field, and the Forge Platform. Prior to joining Autodesk, Inc. in 2015, Keith developed custom solutions for

#### **4000**

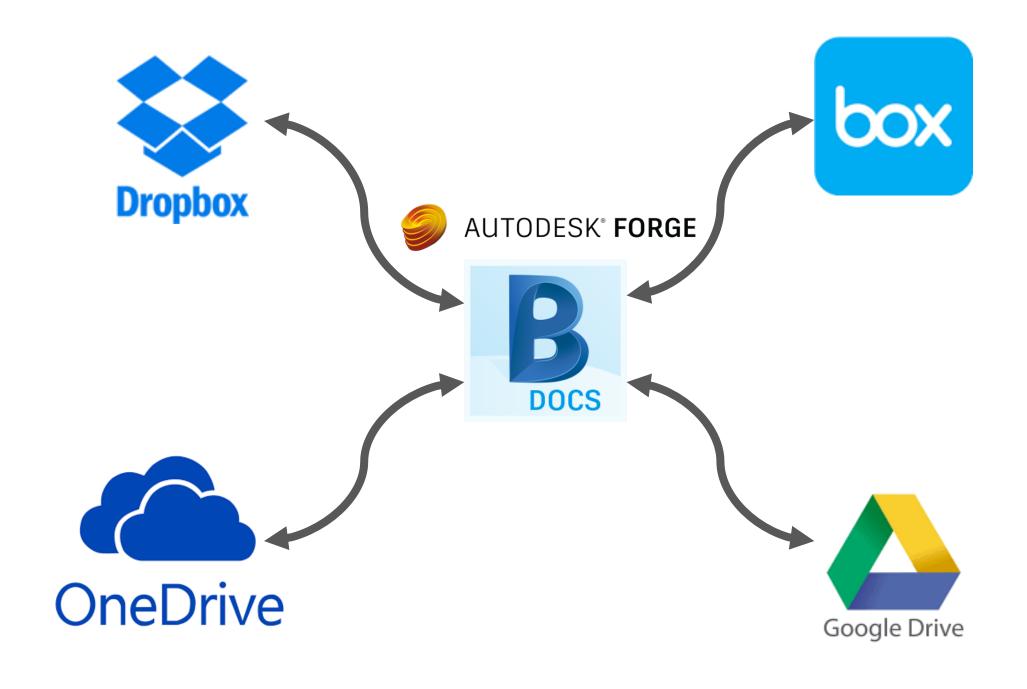
Tuesday, Nov 14, 1:00 PM - 2:00 PM
 San Polo 3504, Level 3

#### Similar Sessions

- CS125242 Integrate BIM 360 Within Your Enterprise with Forge
- CS129232 BIM 360 and API for a Connected Construction Ecosystem (Repeat)
- CS128291 BIM 360 Product Partnership

Today: 1-2 pm San Polo 3504, Level 3

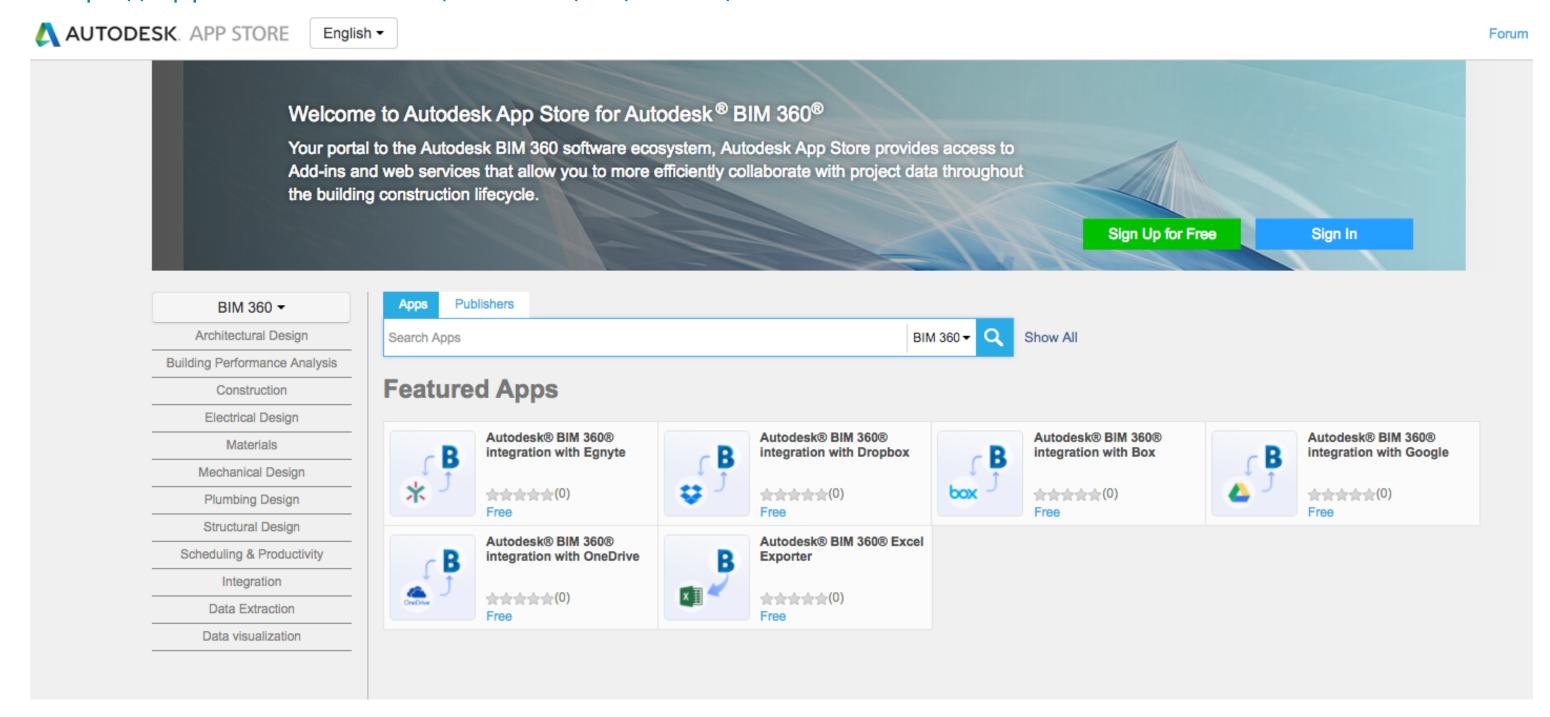
## **Document Synchronization**



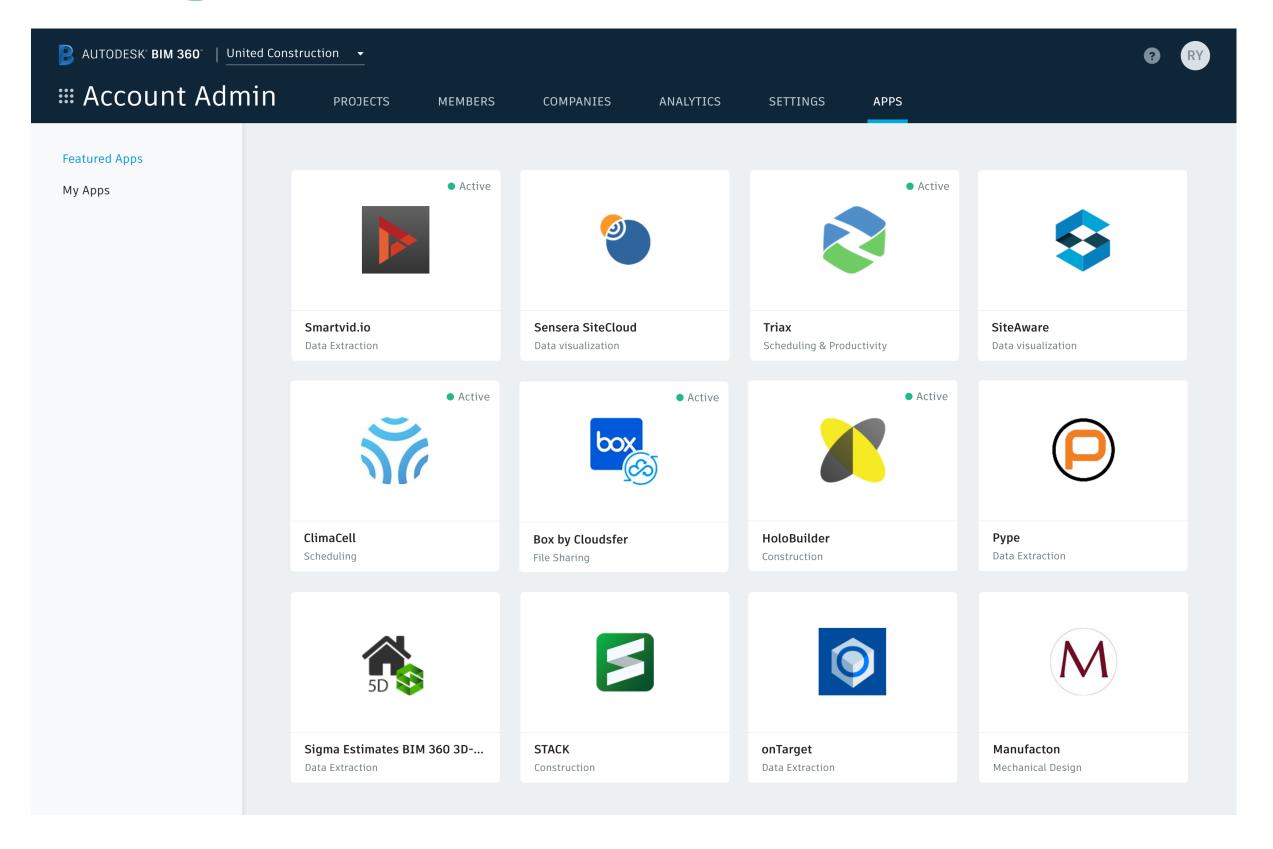
## **Document Synchronization**

#### **Autodesk App Store for BIM 360**

https://apps.autodesk.com/BIM360/en/Home/Index



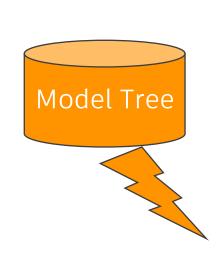
## More Integrations in BIM 360

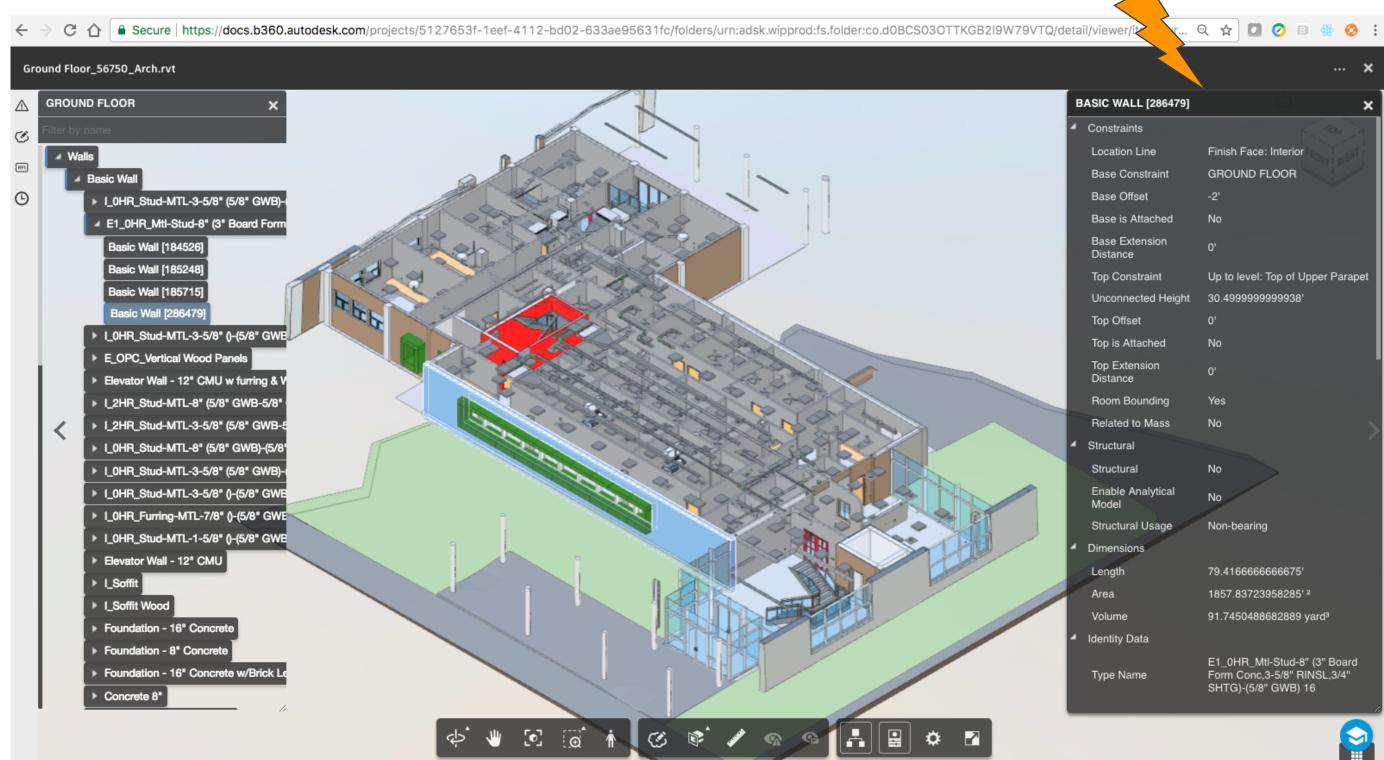


# Data Visualization and Analytics

## A model in BIM 360 Docs



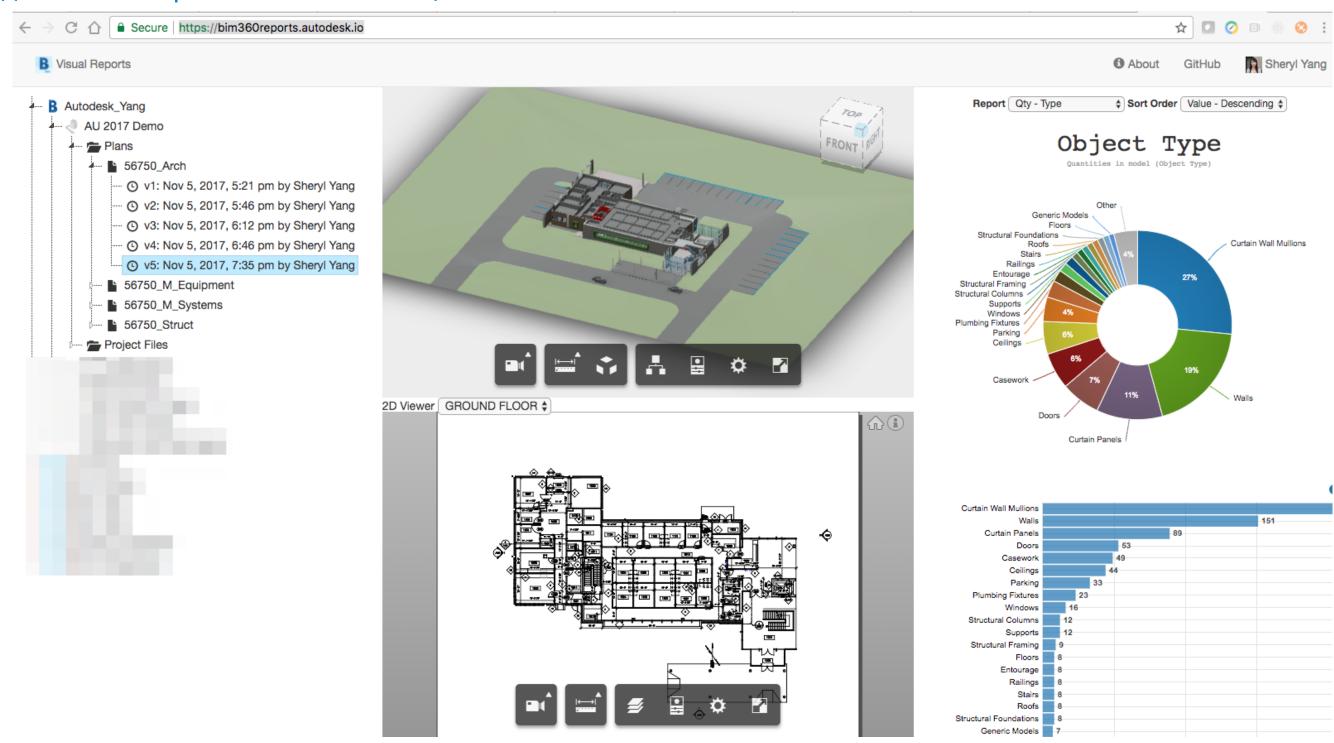




## Visual Reports

#### **Autodesk App Store for BIM 360**

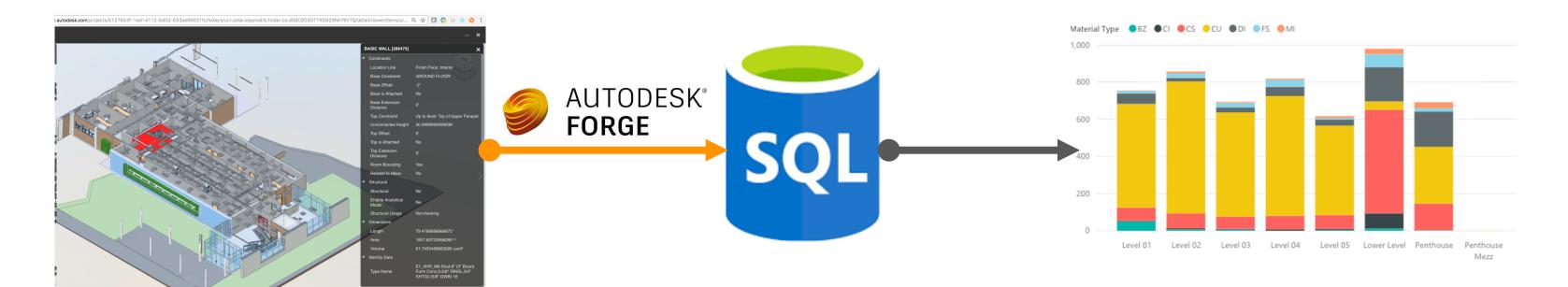
https://bim360reports.autodesk.io/



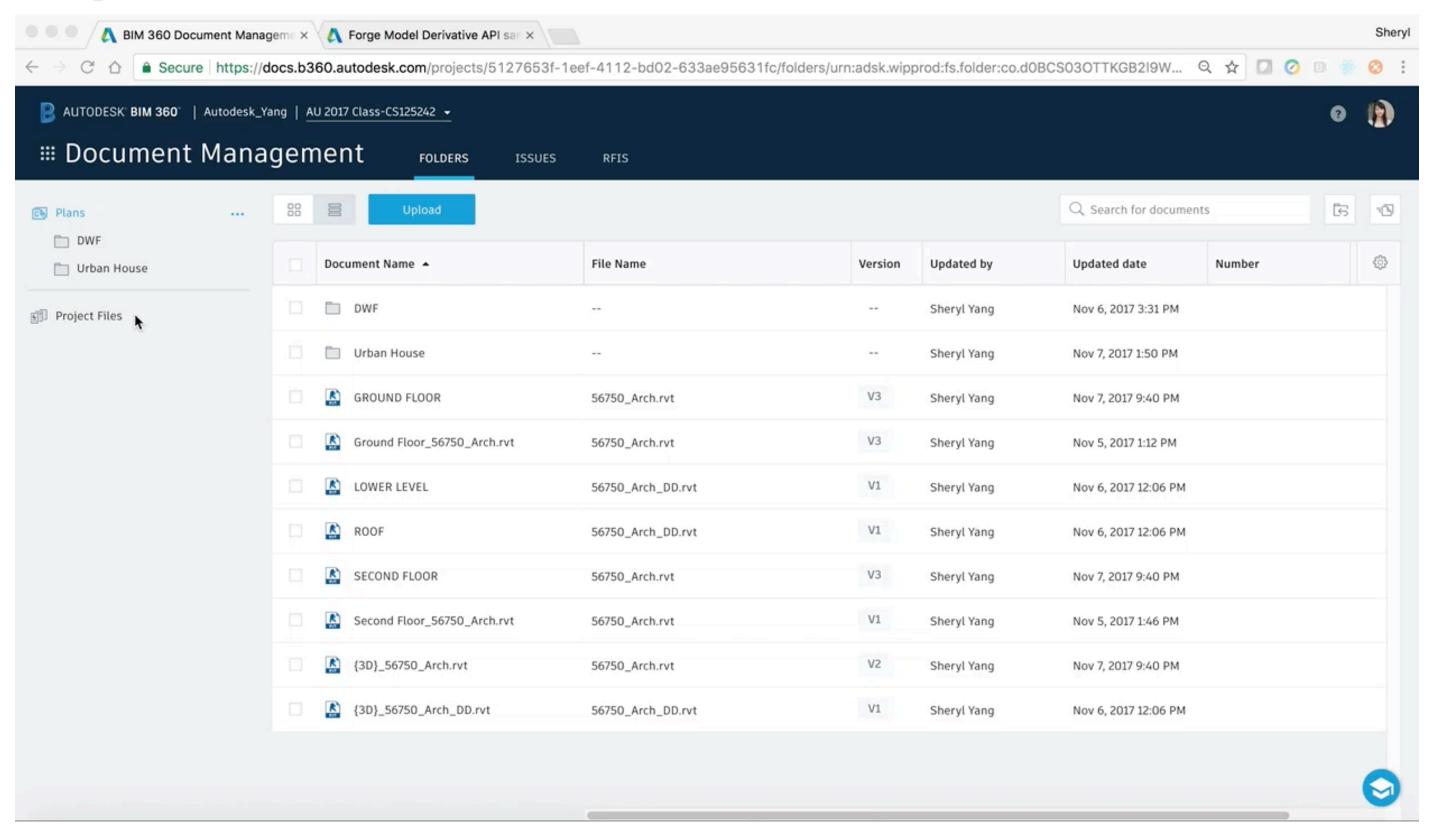
## Integrate BIM 360 Model Data with BI applications







## Integrate BIM 360 Model Data with BI applications



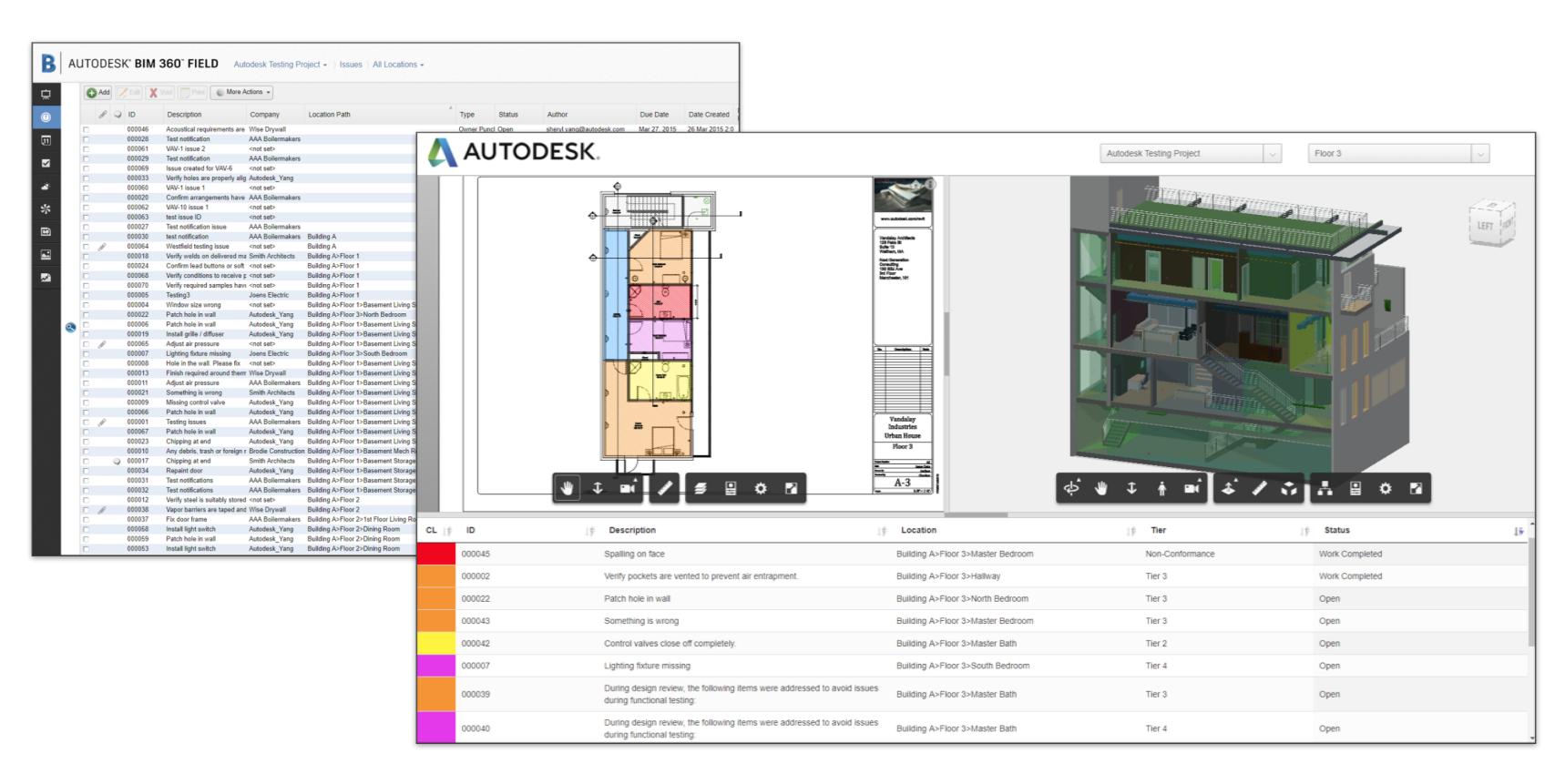
## Customization



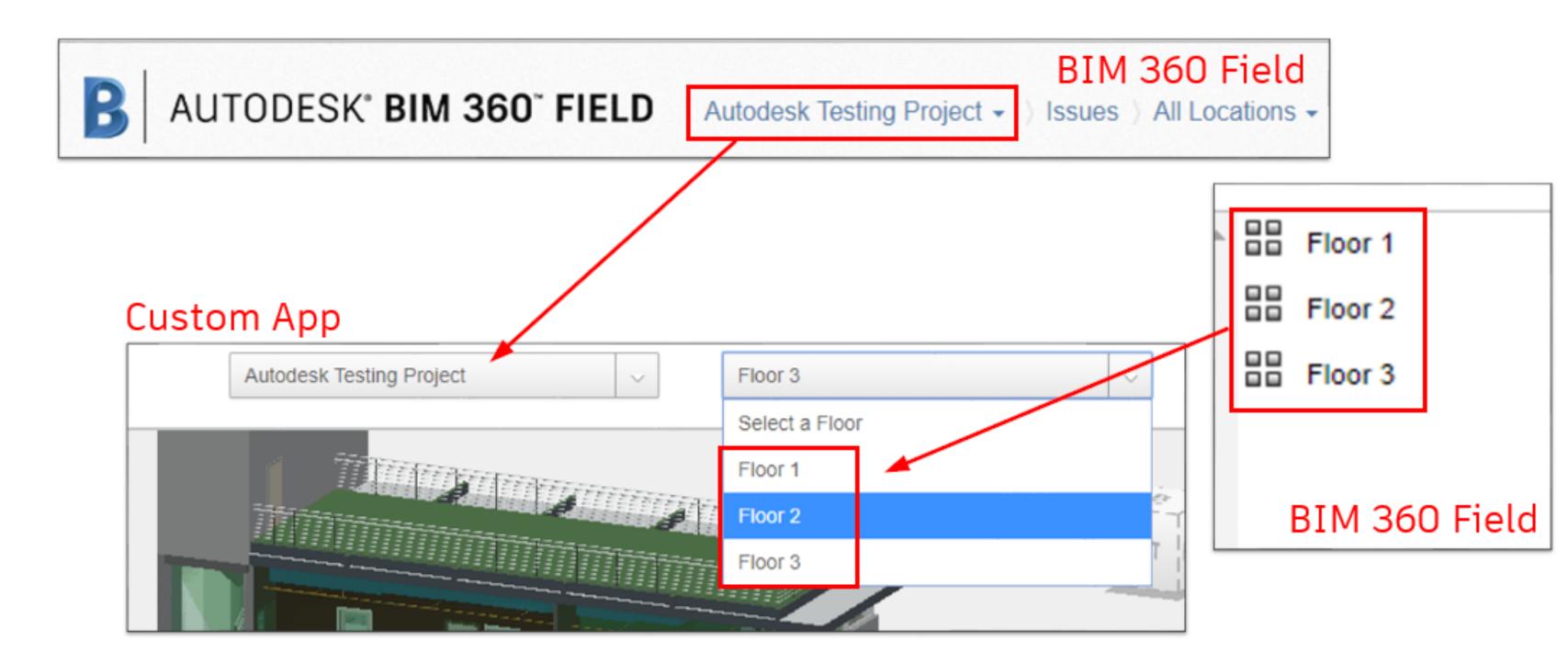
## BIM 360 Field

	_	7	-								
	0	Add	Edit	Void Print More A	ctions 🕶						
		1 0	ID	Description	Company	Location Path	Туре	Status	Author	Due Date	Date Create
- 1			000046	Acoustical requirements are	Wise Drywall		Owner Punct	Open	sheryl.yang@autodesk.com	Mar 27, 2015	26 Mar 2015
			000028	Test notification	AAA Boilermakers		Contractor P	Work Completed	sheryl.yang@autodesk.com		26 Feb 2015
			000061	VAV-1 issue 2	<not set=""></not>		Work to Com	Open	sheryl.yang@autodesk.com	Aug 10, 2015	05 Aug 2015
			000029	Test notification	AAA Boilermakers		Contractor P	Work Completed	sheryl.yang@autodesk.com		26 Feb 2015
			000069	Issue created for VAV-6	<not set=""></not>		Punch List	Open	sheryl.yang@autodesk.com	Oct 17, 2015	12 Oct 2015
			000033	Verify holes are properly alig	Autodesk Yang		Safety	Open	sheryl.yang@autodesk.com		17 Mar 2015
			000060	VAV-1 issue 1	<not set=""></not>		Commissioni	-	sheryl.yang@autodesk.com	Aug 10, 2015	05 Aug 2015
			000020	Confirm arrangements have	AAA Boilermakers		QA/QC	Open	sheryl.yang@autodesk.com		20 Jan 2015
			000062	VAV-10 issue 1	<not set=""></not>			Open	sheryl.yang@autodesk.com	Aug 10, 2015	05 Aug 2015
			000063	test issue ID	<not set=""></not>		Punch List	Open	sheryl.yang@autodesk.com	Aug 29, 2015	24 Aug 2015
			000027	Test notification issue	AAA Boilermakers		Contractor P		sheryl.yang@autodesk.com	<b>3</b> ==, ====	26 Feb 2015
			000030	test notification	AAA Boilermakers	Building A	Contractor P	-	sheryl.yang@autodesk.com	Feb 27, 2015	26 Feb 2015
		P	000064	Westfield testing issue	<not set=""></not>	Building A	Punch List	Open	sheryl.yang@autodesk.com	Sep 8, 2015	03 Sep 2015
		0"	000018	Verify welds on delivered ma		Building A>Floor 1	QA/QC	Open	sheryl.yang@autodesk.com		19 Jan 2015
			000024	Confirm lead buttons or soft		Building A>Floor 1	QA/QC	Open	sheryl.yang@autodesk.com	Jan 22, 2015	21 Jan 2015
			000068	Verify conditions to receive p		Building A>Floor 1	QA/QC	Open	sheryl.yang@autodesk.com	Sep 6, 2015	01 Sep 2015
			000070	Verify required samples have		Building A>Floor 1	QA/QC	Open	sheryl.yang@autodesk.com	Nov 2, 2015	28 Oct 2015
			000005	Testing3	Joens Electric	Building A>Floor 1	Work List	Open	sheryl.yang@autodesk.com	1107 2, 2010	08 Jan 2015
			000004	Window size wrong	<not set=""></not>	Building A>Floor 1>Basement Living Space	Contractor P		sheryl.yang@autodesk.com	Jan 9, 2015	08 Jan 2015
			000022	Patch hole in wall	Autodesk Yang	Building A>Floor 3>North Bedroom	Owner Punct		sheryl.yang@autodesk.com	Jan 22, 2015	21 Jan 2015
			0000022	Patch hole in wall	Autodesk_Yang	Building A>Floor 1>Basement Living Space	Owner Punci		sheryl.yang@autodesk.com	0011 22, 2013	08 Jan 2015
			000019	Install grille / diffuser	Autodesk_Yang	Building A>Floor 1>Basement Living Space	Work List	Open	sheryl.yang@autodesk.com		20 Jan 2015
		D	000015	Adjust air pressure	<not set=""></not>	Building A>Floor 1>Basement Living Space		Open	sheryl.yang@autodesk.com	Aug 18, 2015	13 Aug 2015
		B	000007	Lighting fixture missing	Joens Electric	Building A>Floor 3>South Bedroom	Work List	Open	sheryl.yang@autodesk.com	Jan 9, 2015	08 Jan 2015
			800000	Hole in the wall. Please fix	<not set=""></not>	Building A>Floor 1>Basement Living Space	QA/QC			Jan 9, 2015	08 Jan 2015
			000003			Building A>Floor 1>Basement Living Space	Owner Punct		sheryl.yang@autodesk.com sheryl.yang@autodesk.com	Jan 5, 2015	13 Jan 2015
				Finish required around them	-		QA/QC				
			000011	Adjust air pressure	AAA Boilermakers	Building A>Floor 1>Basement Living Space Building A>Floor 1>Basement Living Space		Open	sheryl.yang@autodesk.com		12 Jan 2015
			000021	Something is wrong	Smith Architects	Building A>Floor 1>Basement Living Space  Building A>Floor 1>Basement Living Space	Contractor P		sheryl.yang@autodesk.com	Inn 0, 2015	21 Jan 2015
			000009	Missing control valve Patch hole in wall	Autodesk_Yang	0 ,	Owner Punch		sheryl.yang@autodesk.com	Jan 9, 2015	08 Jan 2015
		0			Autodesk_Yang	Building A>Floor 1>Basement Living Space	Punch List		sheryl.yang@autodesk.com	Aug 18, 2015	13 Aug 2019
		B	000001	Testing issues	AAA Boilermakers	Building A>Floor 1>Basement Living Space	Contractor P		sheryl.yang@autodesk.com	A 40 2045	01 Jan 2015
			000067	Patch hole in wall	Autodesk_Yang	Building A>Floor 1>Basement Living Space	Punch List		sheryl.yang@autodesk.com	Aug 18, 2015	13 Aug 2015
			000023		Autodesk_Yang	Building A>Floor 1>Basement Living Space	Owner Punct		sheryl.yang@autodesk.com	Jan 22, 2015	
			000010			Building A>Floor 1>Basement Mech Room	QA/QC	Open	sheryl.yang@autodesk.com		08 Jan 2015
		Q	000017	Chipping at end	Smith Architects	Building A>Floor 1>Basement Storage	Owner Punci		sheryl.yang@autodesk.com		19 Jan 2015
			000034	Repaint door	Autodesk_Yang	Building A>Floor 1>Basement Storage	Owner Punct		sheryl.yang@autodesk.com		20 Mar 2015
			000031	Test notifications	AAA Boilermakers	Building A>Floor 1>Basement Storage	Contractor P		sheryl.yang@autodesk.com		26 Feb 2015
			000032	Test notifications		Building A>Floor 1>Basement Storage		_	sheryl.yang@autodesk.com		26 Feb 2015
		0	000012	Verify steel is suitably stored		Building A>Floor 2	QA/QC	Open	sheryl.yang@autodesk.com		13 Jan 2015
		B)	000038	Vapor barriers are taped and		Building A>Floor 2	Contractor P		sheryl.yang@autodesk.com	Mar 27, 2045	20 Mar 2015
			000037	Fix door frame	AAA Boilermakers	Building A>Floor 2>1st Floor Living Room	Owner Punch	_	sheryl.yang@autodesk.com	Mar 27, 2015	20 Mar 2015
			000058	Install light switch	Autodesk_Yang	Building A>Floor 2>Dining Room	Work List	Open	sheryl.yang@autodesk.com		04 May 2019
- 11			000059	Patch hole in wall	Autodesk_Yang	Building A>Floor 2>Dining Room	Punch List	Open	sheryl.yang@autodesk.com		04 May 201

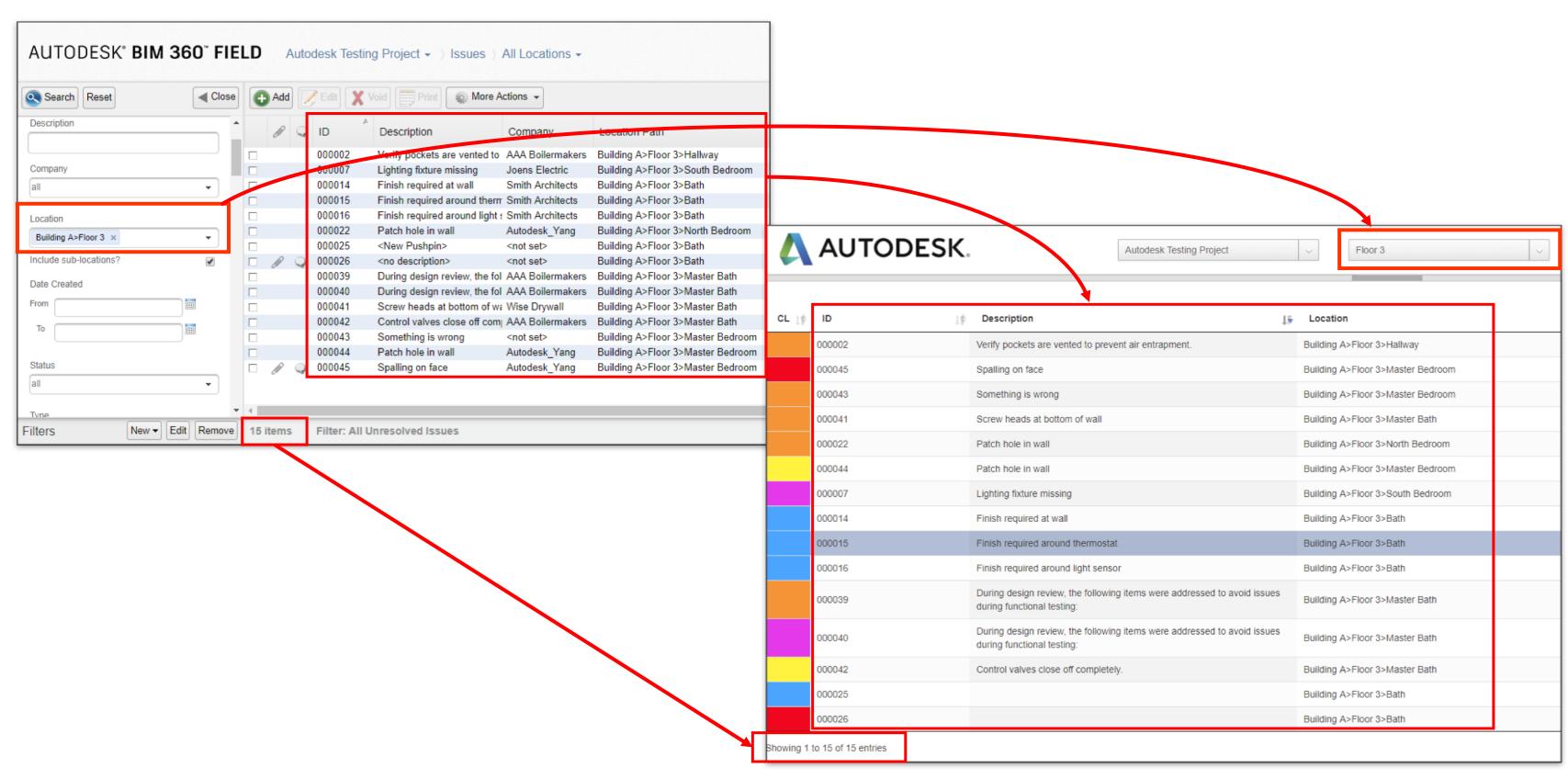
## Visualize Data



## BIM 360 Field to your custom app



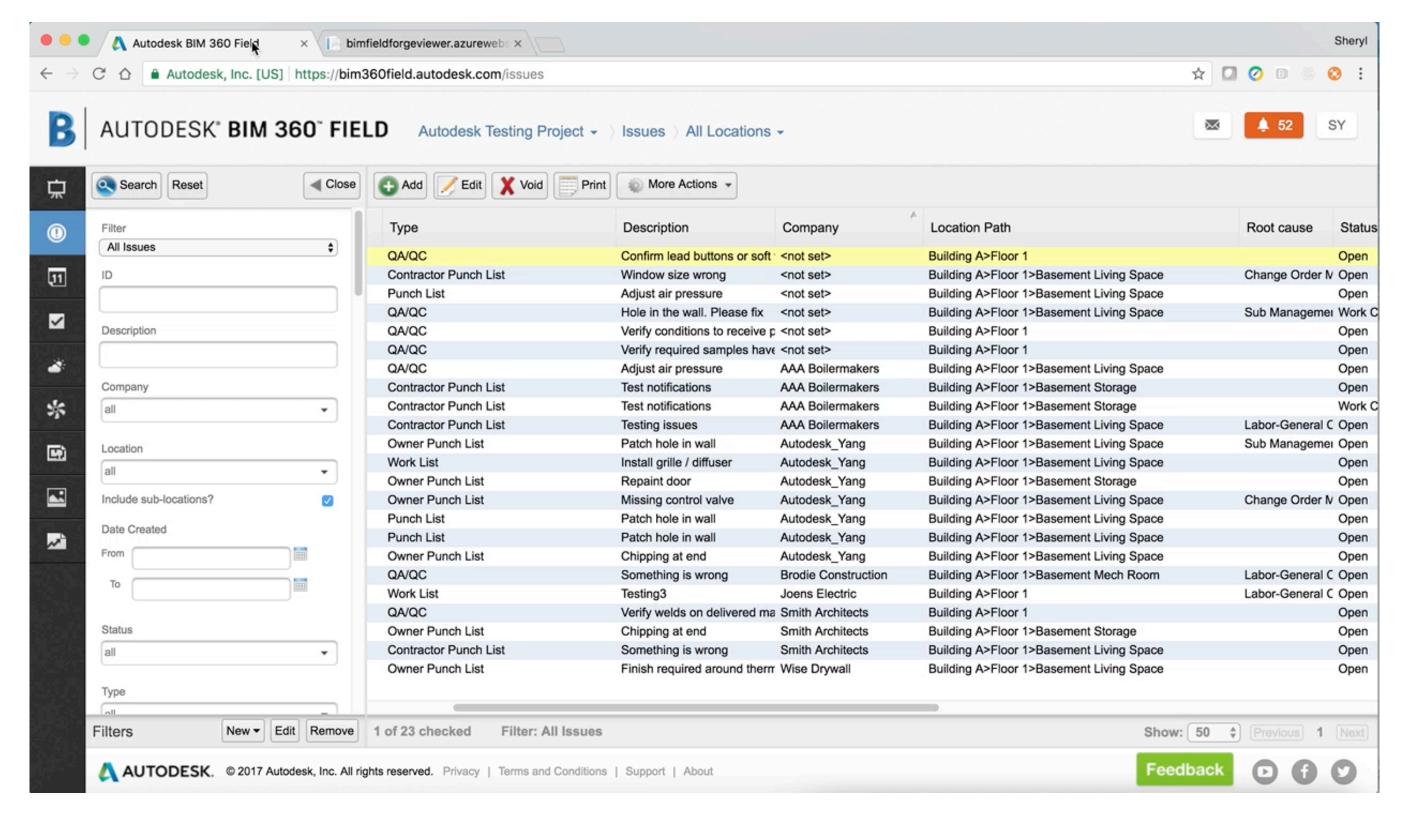
# BIM 360 Field to your custom app

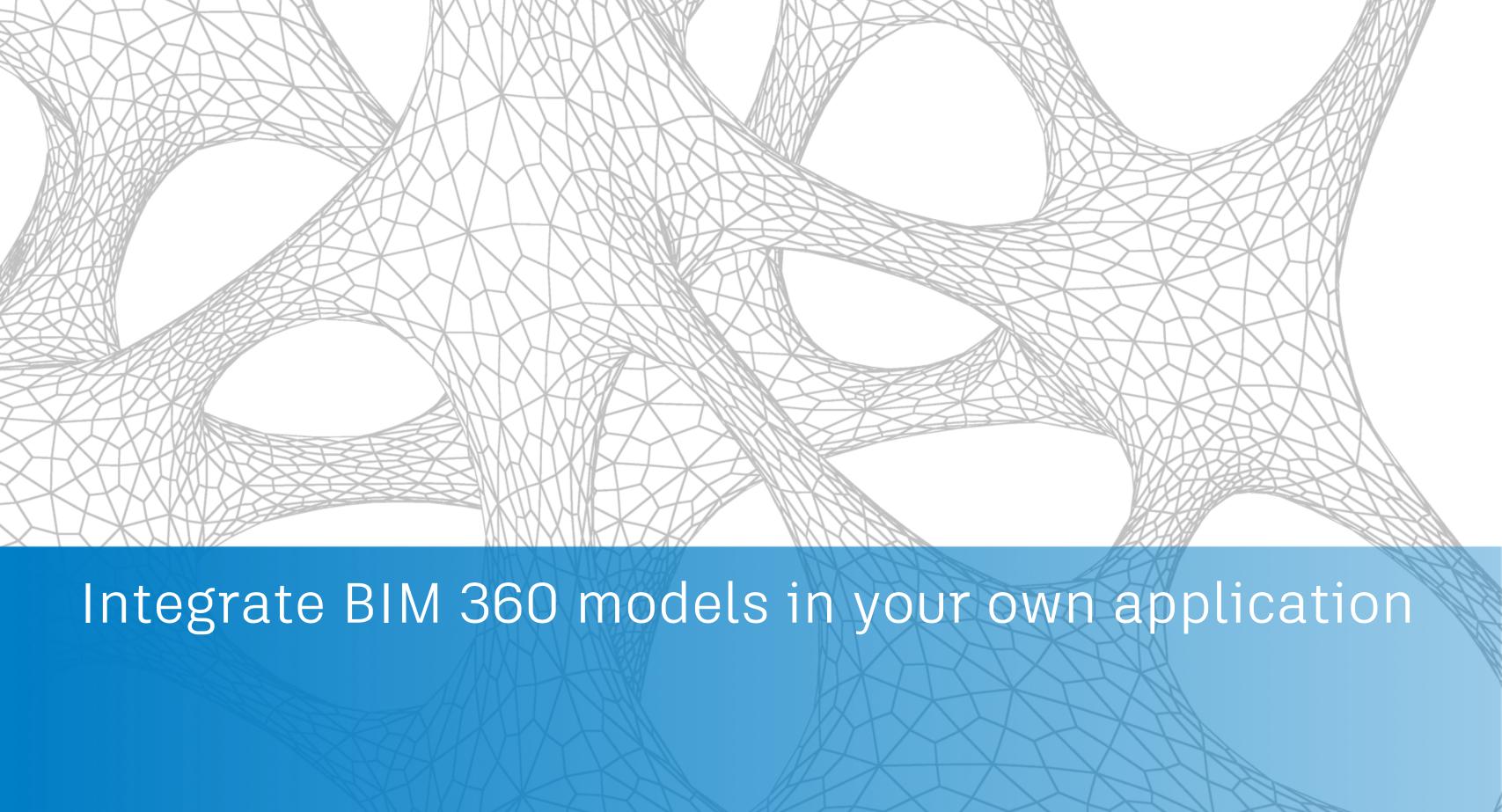


# BIM 360 Field & Forge Viewer

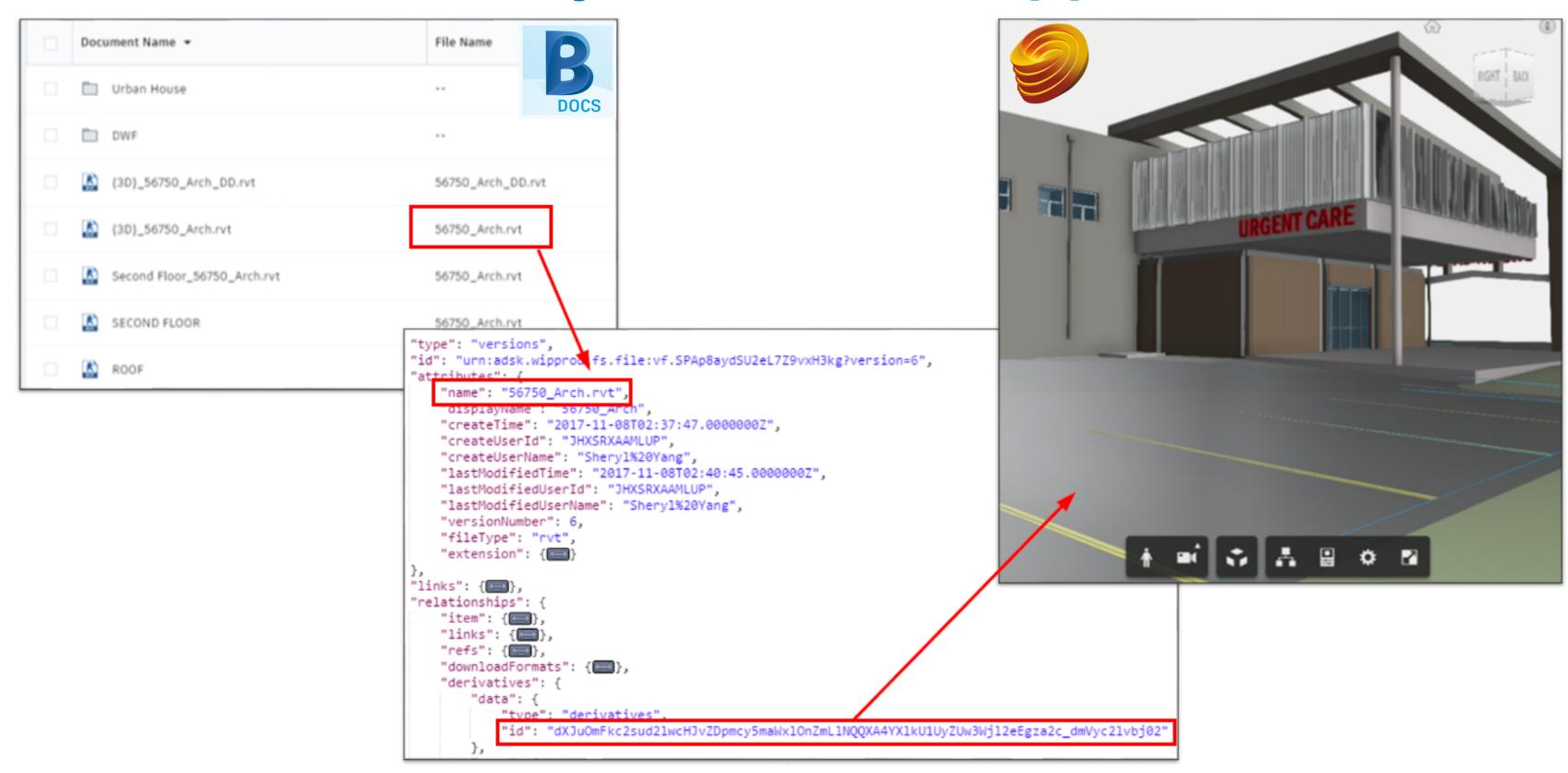


### Extend BIM 360 Field with Forge Viewer





## BIM 360 Docs to your Custom App



# Leverage BIM 360 Docs & Forge Viewer

Forge Viewer

Create Bucket

Upload to Bucket

Translate Model

View Model

Forge Viewer & BIM 360 Docs

Retrieve Model URN

View Model

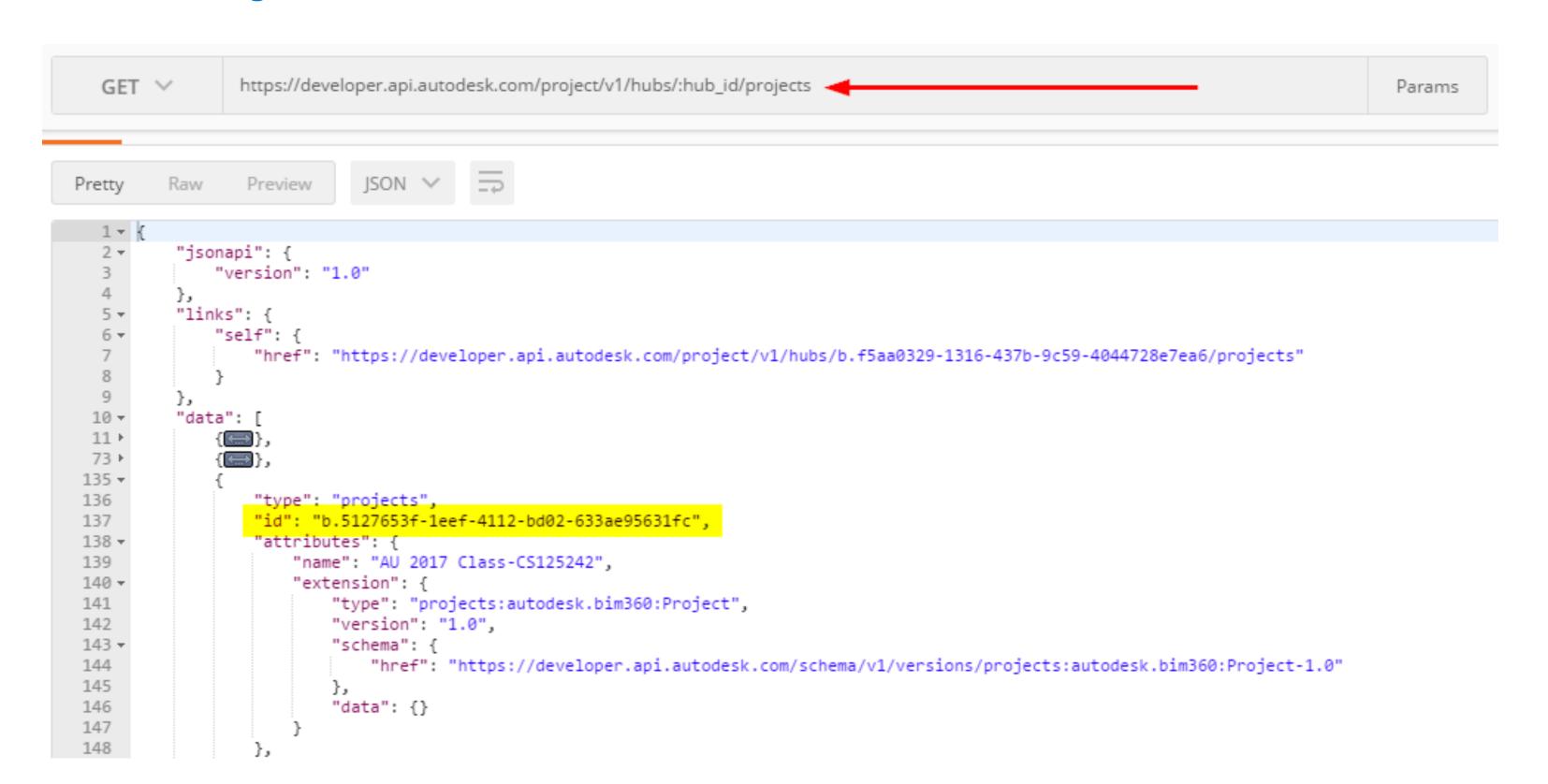
### Retrieve Model URN

- Get Hub ID
- Get Project ID
- Get Folder ID
- Get Folder Content

### Get Hub ID



## Get Project ID



#### Get Folder ID

https://developer.api.autodesk.com/project/v1/hubs/:hub\_id/projects/:project\_id/topFolders -GET V Pretty Raw Preview ISON V "links": { 6 + "self": { "href": "https://developer.api.autodesk.com/project/v1/hubs/b.f5aa0329-1316-437b-9c59-4044728e7ea6/projects/ 8 9 "data": [ 10 -11 -12 "type": "folders", "id": "urn:adsk.wipprod:fs.folder:co.d0BCS030TTKGB219W79VTQ" 13 "attributes": { 14 -15 "name": "Plans", "displayName": "Plans", 16 17 "createTime": "2017-11-05T16:43:11.00000000Z", 18 "createUserId": "", 19 "createUserName": "", "lastModifiedTime": "2017-11-08T02:40:42.0000000Z", 20 21 "lastModifiedUserId": "JHXSRXAAMLUP", "lastModifiedUserName": "Shery1%20Yang", 22 23 "objectCount": 17, "hidden": false,

#### **Get Folder Content**

https://developer.api.autodesk.com/data/v1/projects/:project\_id/folders/:folder\_id/contents GET ∨ Pretty Raw Preview ISON V 1224 1225 "included": [ 1226 -1227 -"type": "versions". 1228 "id": "urn:adsk.wipprod:fs.file:vf.SPAp8aydSU2eL7Z9vxH3kg?version=6", 1229 "attributes": { 1230 -"name": "56750 Arch.rvt", 1231 "displayName": "56750\_Arch", 1232 "createTime": "2017-11-08T02:37:47.00000002", 1233 "createUserId": "JHXSRXAAMLUP", 1234 "createUserName": "Shery1%20Yang", 1235 1236 "lastModifiedTime": "2017-11-08T02:40:45.00000002", "lastModifiedUserId": "JHXSRXAAMLUP", 1237 "lastModifiedUserName": "Shery1%20Yang", 1238 "versionNumber": 6, 1239 "fileType": "rvt", 1240 1241 ▶ "extension": { 📟 } 1255 "links": { 📟 }, 1256 ▶ "relationships": { 1261 -"item": { 📟 }, 1262 ▶ "links": { 📟 }, 1273 ▶ 1280 ▶ "refs": { 📟 }, 1290 ▶ "downloadFormats": { > }. "derivatives": { 1297 -1298 -"data": { 1299 "type": "derivatives", 1300 "id": "dXJuOmFkc2sud21wcHJvZDpmcv5maWx10nZmL1NOOXA4YX1kU1UvZUw3Wi12eEgza2c dmVvc21vbi02" 1301

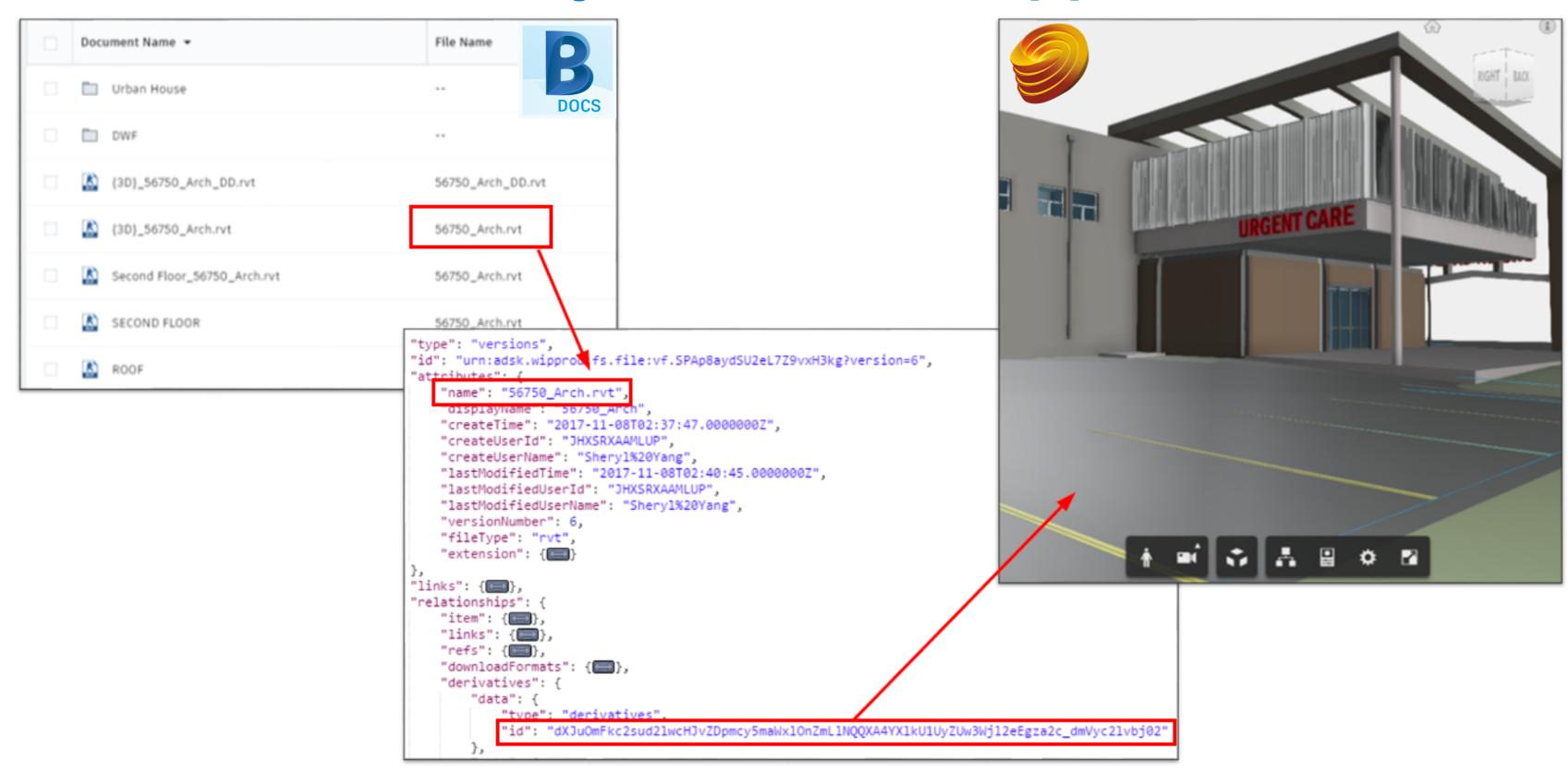
#### View it

To view your model without any HTML simply use the following url:

https://models.autodesk.io/view.html?token=MY\_ACCESS\_TOKEN\$urn=MY\_URN

- MY\_ACCESS\_TOKEN: Token generated by your Client ID and Client Secret
- MY\_URN: The Derivative ID of your model

## BIM 360 Docs to your Custom App





#### Resources

- Documentation: <a href="https://developer.autodesk.com/">https://developer.autodesk.com/</a>
- Old Blog: <a href="http://adndevblog.typepad.com/cloud\_and\_mobile/">http://adndevblog.typepad.com/cloud\_and\_mobile/</a>
- New Blog: <a href="https://forge.autodesk.com/blog">https://forge.autodesk.com/blog</a>
- Demos: <a href="https://forge-rcdb.autodesk.io/">https://forge-rcdb.autodesk.io/</a>
- VR Demo: <a href="http://www.vrok.it/?session=3Qs2II">http://www.vrok.it/?session=3Qs2II</a>
- BIM 360 App Store:
   <a href="https://apps.autodesk.com/BIM360/en/Home/Index">https://apps.autodesk.com/BIM360/en/Home/Index</a>

### Forge Answer Bar

- Location: EP Lounge
- Hours: Everyday
  - 8AM to 10AM
  - 1PM to 4PM







Make anything.

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