

# Turning Days Into Minutes

## Inventor Design Automation on Forge

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# The Forge Platform

# WHAT IS FORGE?

A set of [web service APIs\\*](#) and components that power the future of making.

## Forge is:

- The [common technology stack](#) Autodesk uses to build its own web applications.
- APIs you can use to [extend and integrate Autodesk web applications](#) into your workflows.
- Components from our technology stack that you can use in [your own web applications](#).

*\*Application Programming Interface*





# WHAT CAN I DO WITH FORGE?

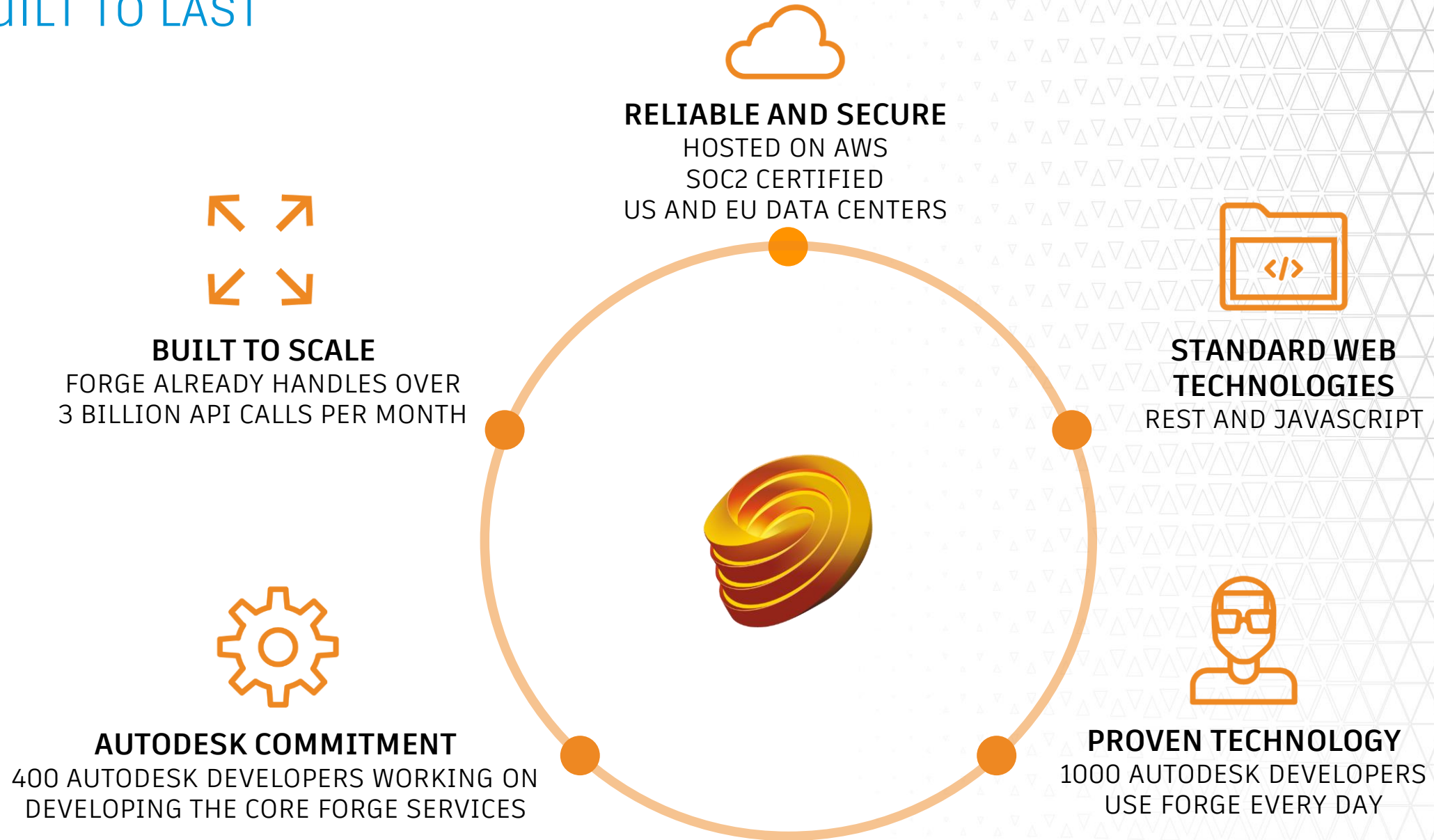
Build online workflows and experiences around your design data.

## Forge can:

- [Connect](#) your design data with your Enterprise systems – ERP, CRM, Financial, PLM, Office 365, etc. Supports [60+ file formats](#).
- [Create, modify or read your data](#) in Autodesk web applications.
- Create [workflows](#) linking Autodesk web applications to other enterprise applications.
- Automate the [creation or editing](#) of your design files – AutoCAD, (and soon) Revit, Inventor, and Max.
- Convert your [drone photography](#) to 3D.



# BUILT TO LAST



# FORGE COMMUNITY BY THE NUMBERS



**40,000+** monthly  
website visitors



**22** Forge Certified  
Systems  
Integrators



**1500+** active  
developer accounts



**90+** enterprise customers are  
evaluating Forge



- SECURE
- SCALABLE
- RELIABLE
- GROWING





# FORGE OFFERING





Data Management  
API



Reality Capture  
API



Design Automation API



BIM 360 API



Model Derivative  
API & Viewer



Webhooks API

# Design Automation





**AUTODESK®  
FORGE**

**Design Automation API for Inventor**

Use Inventor data in cloud-native applications to automate at scale

## Configure

- Engineering Automation
- Sales Configuration
- iLogic

## Export

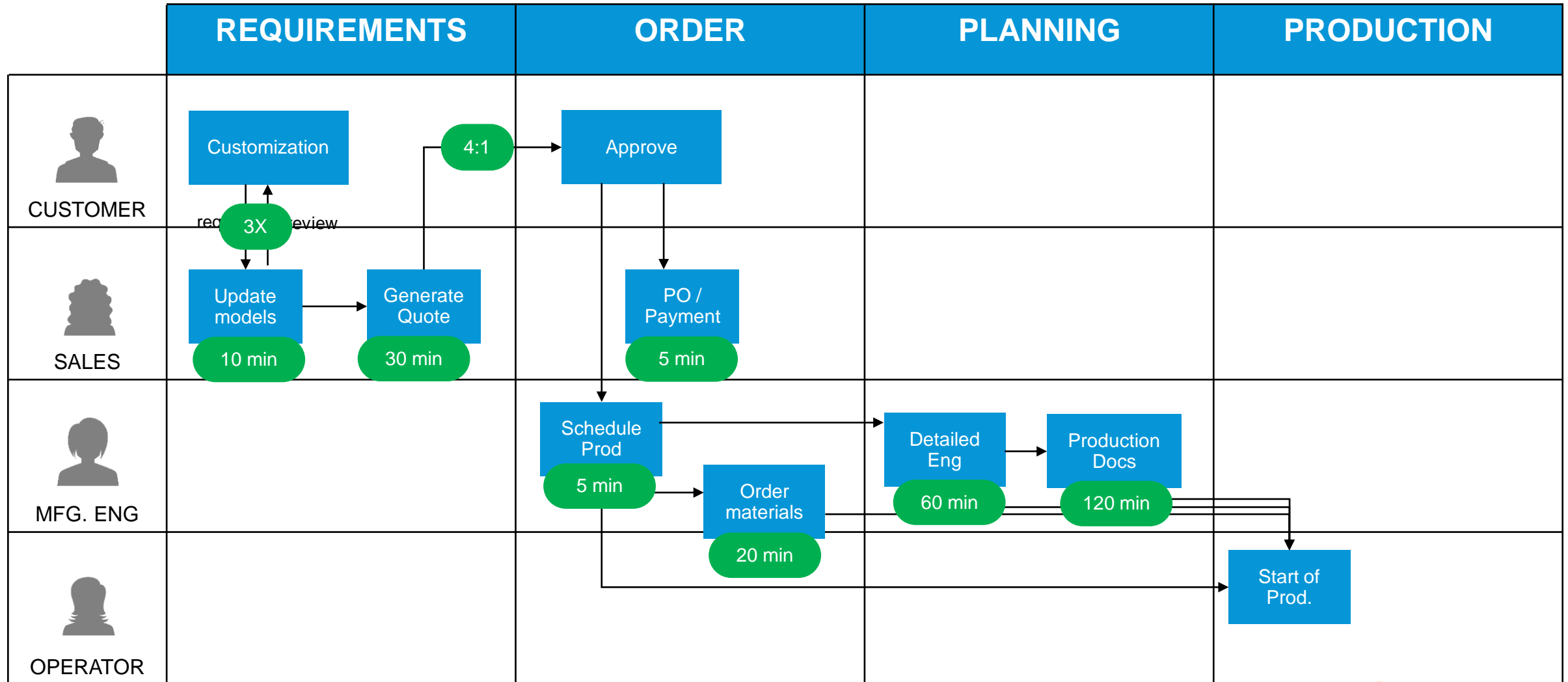
- CAD Formats
- Drawings
- BOM
- Custom Interop

## Generate

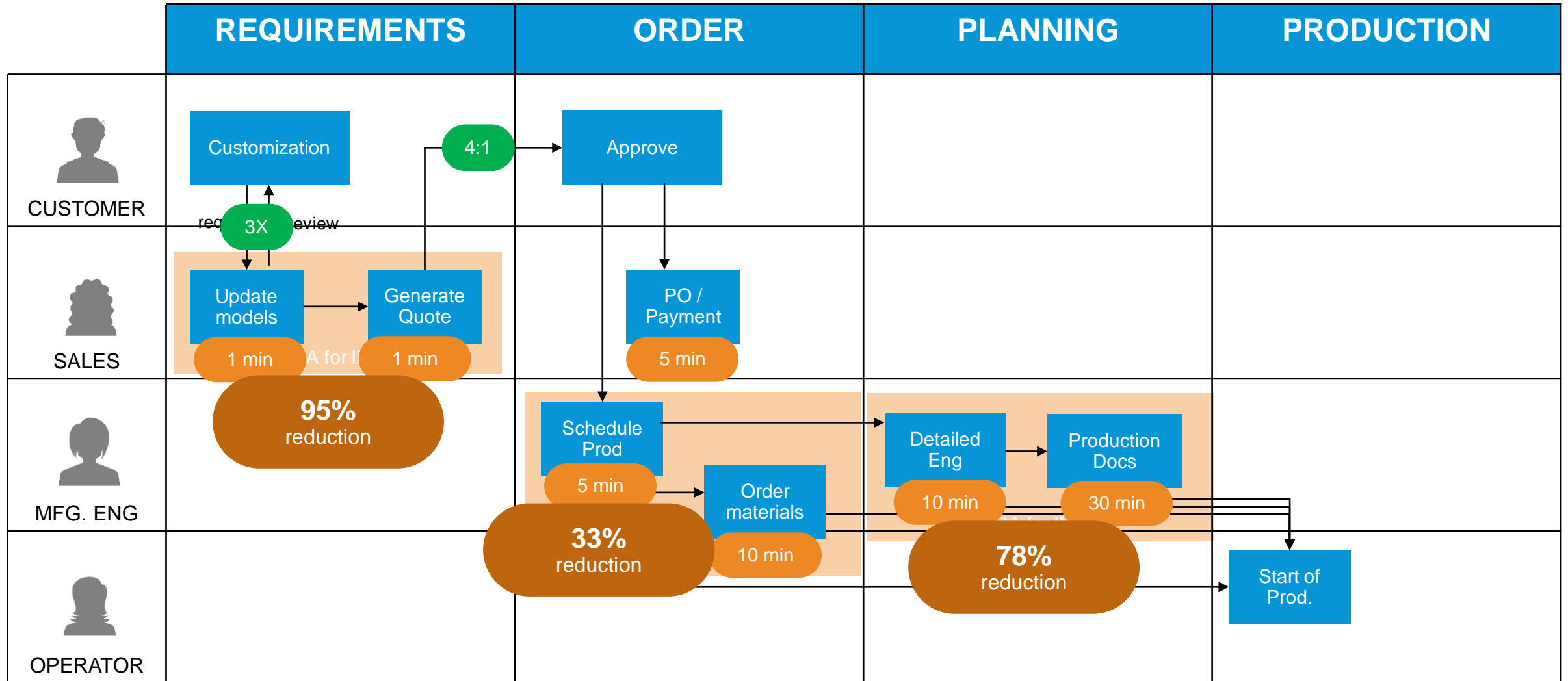
- Design Alternatives
- Product Families
- Model Validation
- Bulk Operations



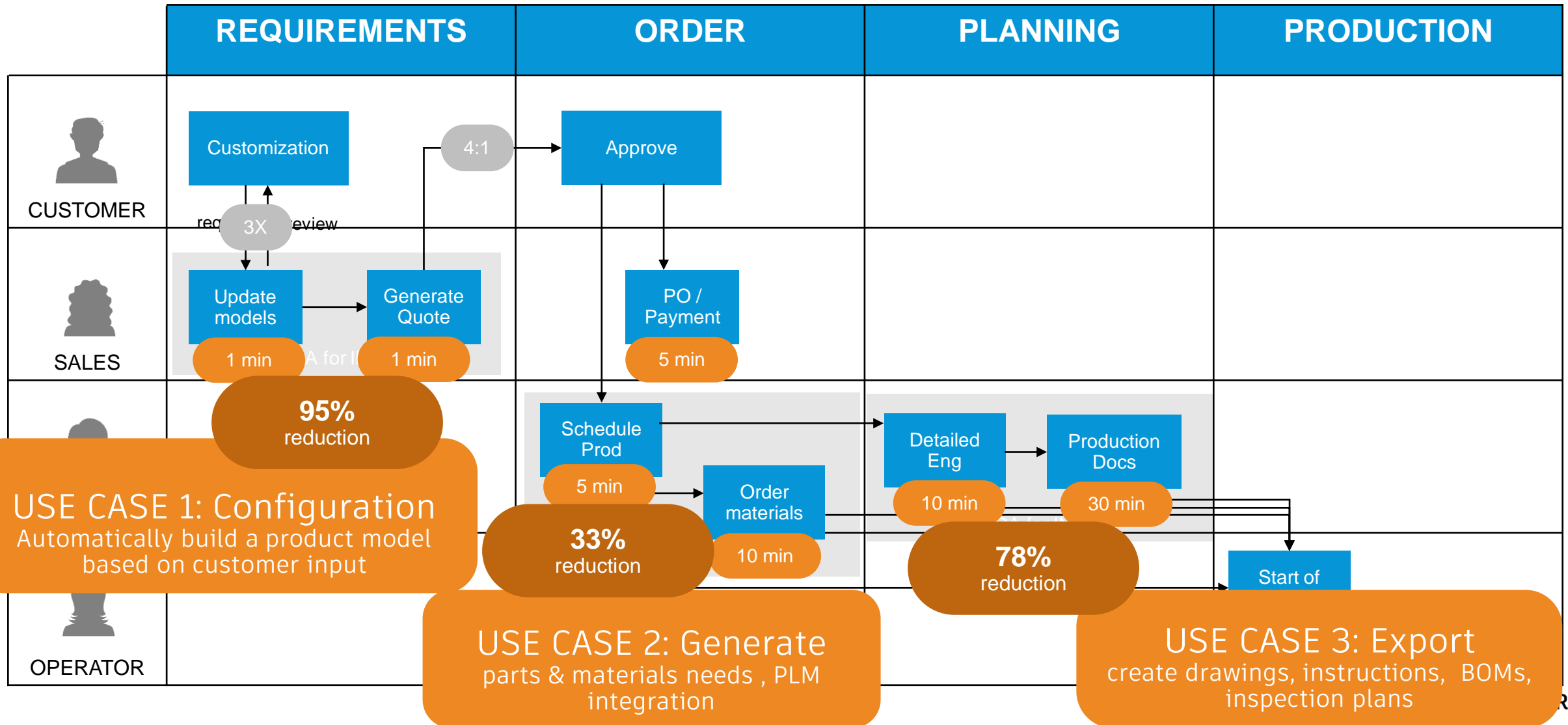
# Typical Workflow: Manual Processes



# Typical Workflow: OPPORTUNITY TO AUTOMATE



## Typical Workflow: OPPORTUNITY TO AUTOMATE







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FORGE**

**Design Automation API for Inventor**

Use Inventor data in cloud-native applications to automate at scale

### USE CASE 1: Configuration

Automatically build a product model  
based on customer input

## Configure

- Engineering Automation
- Sales Configuration
- iLogic

### USE CASE 3: Export

create drawings, instructions, BOMs,  
inspection plans

## Export

- CAD Formats
- Drawings
- BOM
- Custom Interop

### USE CASE 2: Generate

parts & materials needs , PLM  
integration

## Generate

- Design Alternatives
- Product Families
- Model Validation
- Bulk Operations



# Design Automation API v3

Run automations on your design files



AUTODESK® **REVIT®**



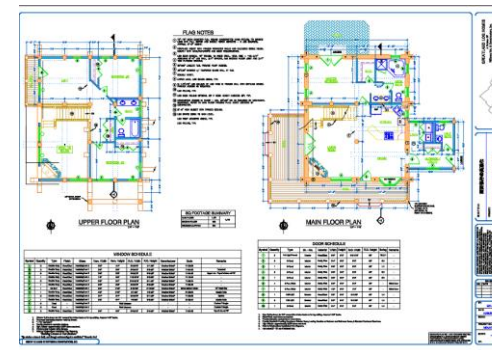
AUTODESK® **INVENTOR®**



AUTODESK® **3DS MAX®**



AUTODESK® **AUTOCAD®**





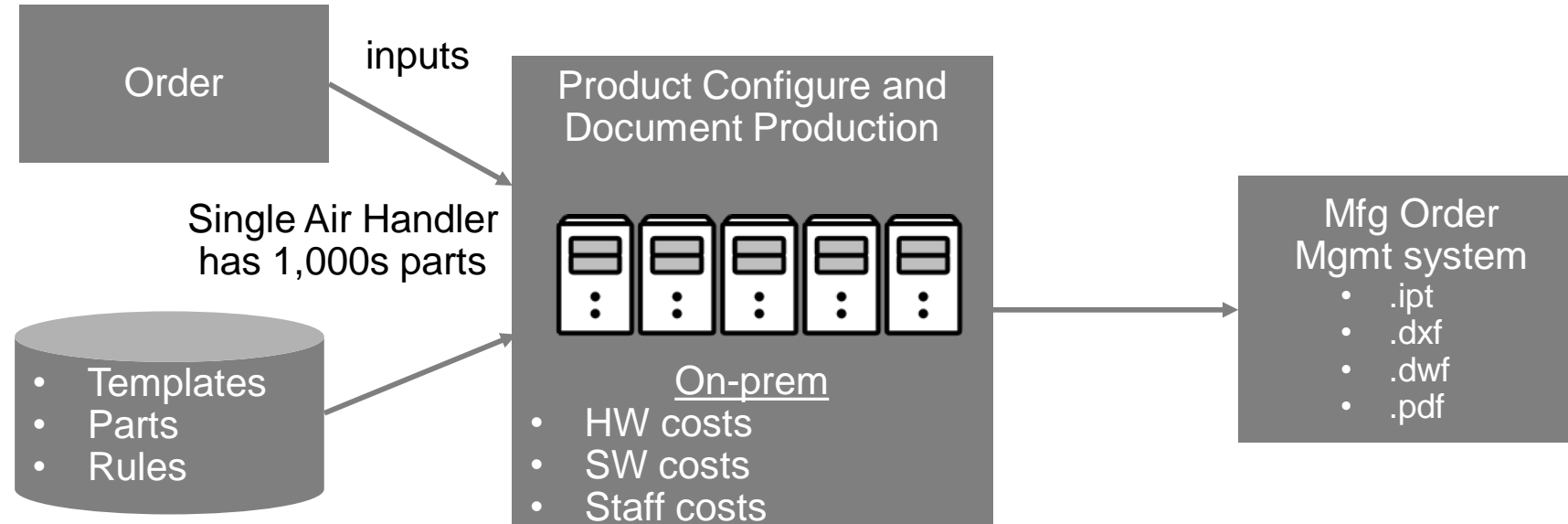
# Example Customers

## Validating Identified Use Cases



# Example: HVAC Company

## Current Product Configuration and Mfg. Document Preparation Process



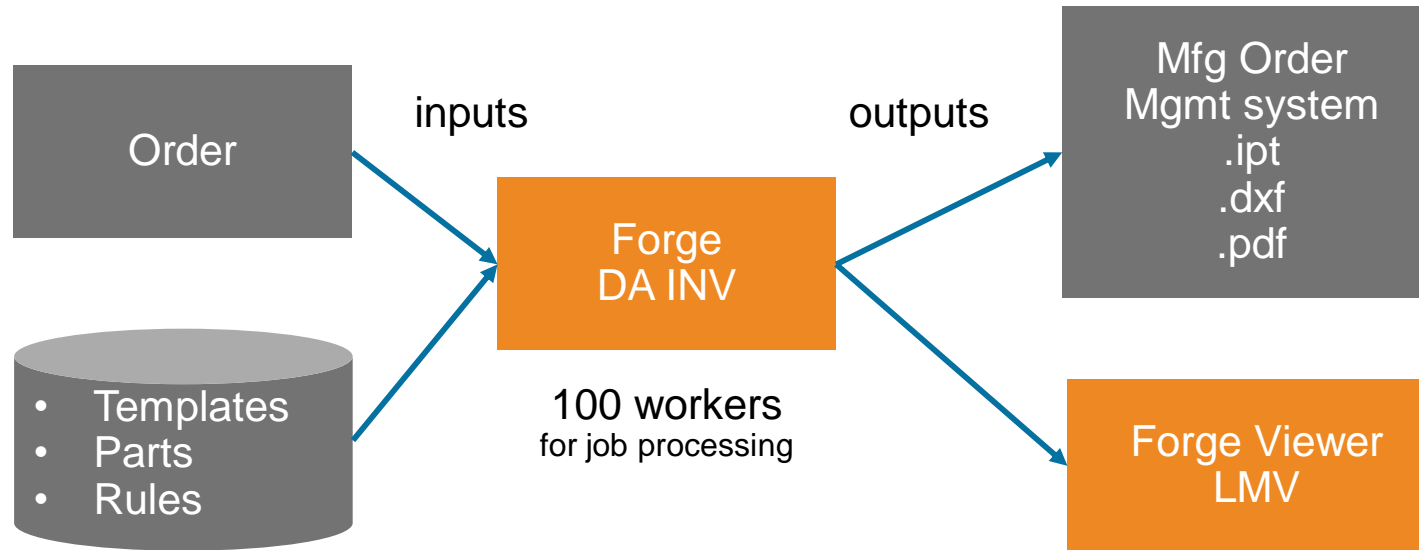
### Job Completion in DAYS

- Heavy compute
- Poor scalability
- High job count

### NEW POC OBJECTIVES:

1. Improve scale: reduce job time – COMPETITIVE ADVANTAGE
2. Remove ADR from Mfg Order Mgmt system
3. Reduce operational costs

# Example: HVAC Company – Active POC



## Job Completion in MINUTES

### RESULTS ACHIEVED:

1. Reduced job time by several orders of magnitude
2. Removed ADR, use Forge Viewer
3. Not dependent on on-prem, reduce SW and Opex Costs

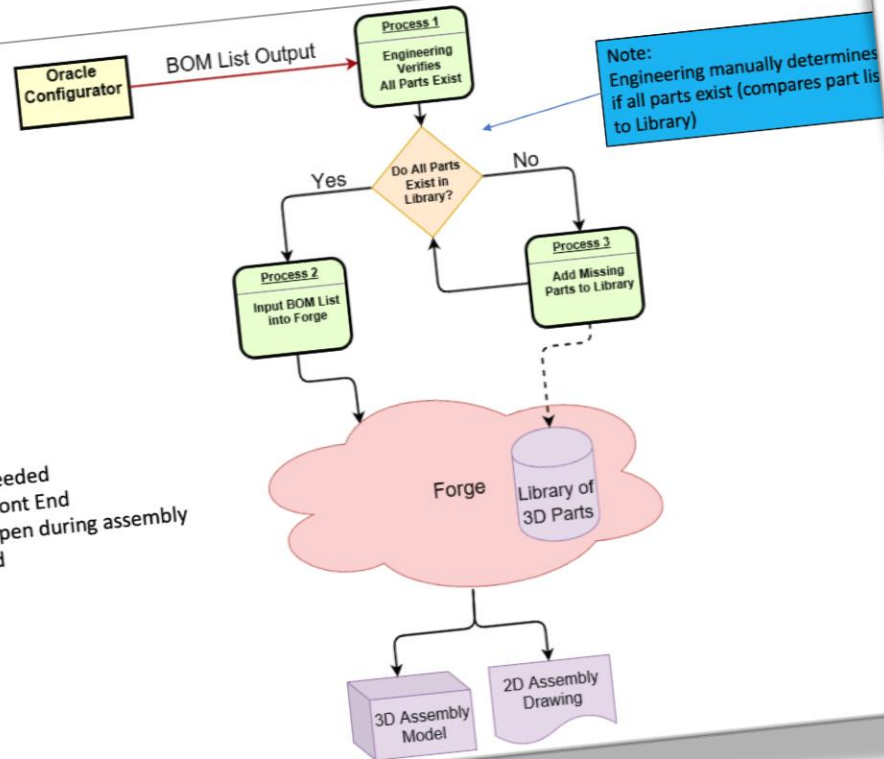
# Example: Valve Company

## Validating Desired Workflow

### Option 1:

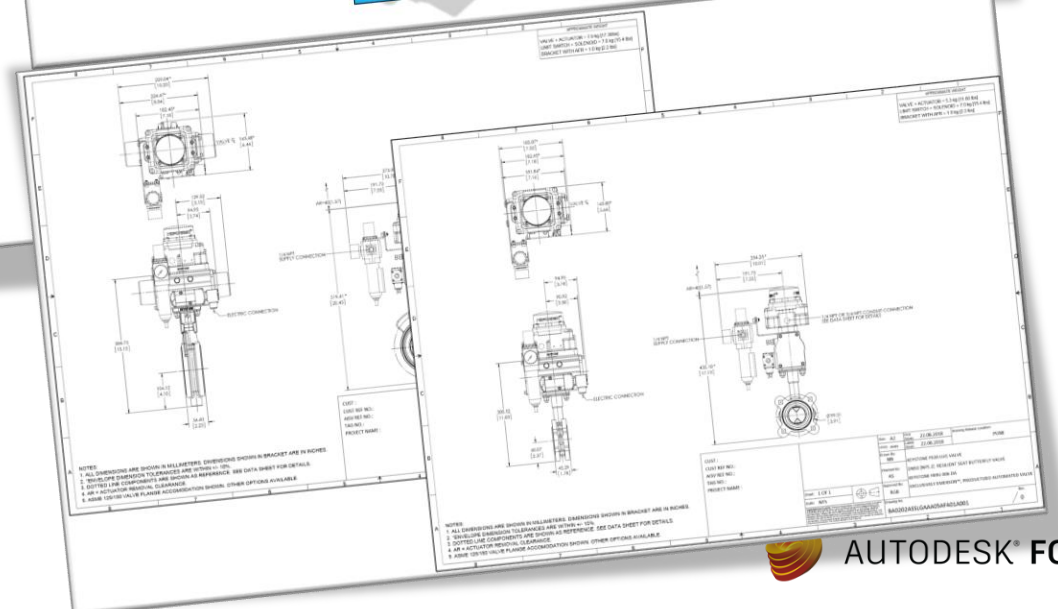
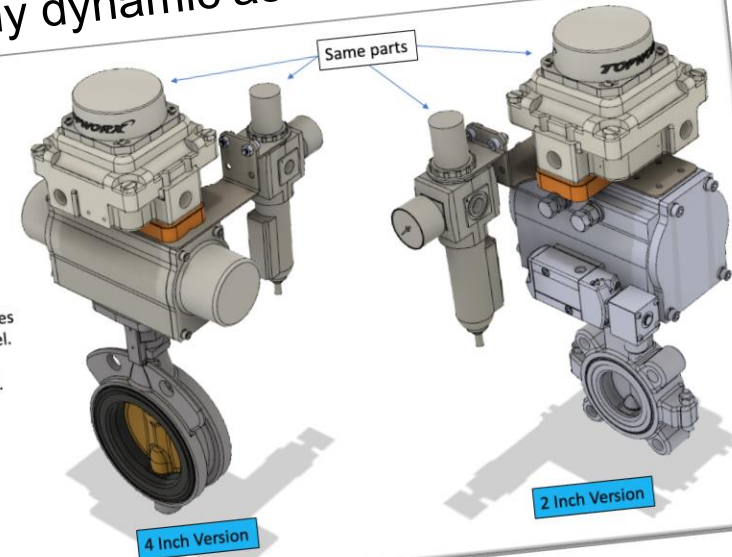
#### Notes:

- 90,000 Parts
- Often receives .STEP files
- No dimensional changes needed
- Most rules live in Oracle Front End
- Some rules/selections happen during assembly
  - Left hand/Right hand
  - Placement Options



Only dynamic assembly of parts

- No dimensional changes needed at feature level.
- Part position and orientation is needed.





# Clean Room Filtration Configurator

## Who

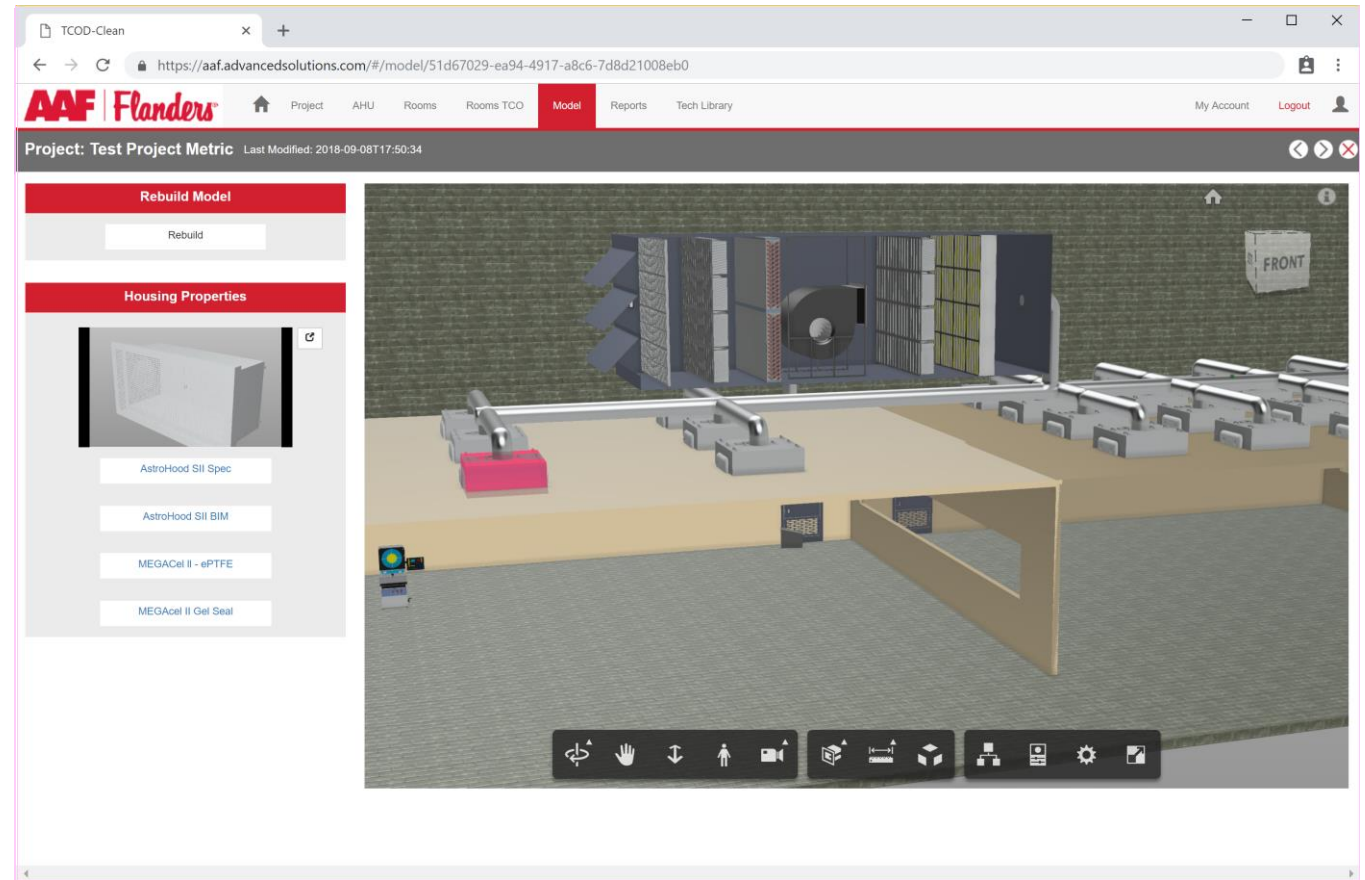
Platinum VAR working with a global customer with a division based in KY

## Situation

Next generation filtration configurator needed a “wow-factor” to excite end users

## Solution

An iLogic driven Inventor model of a clean room system is configured using the Design Automation API and presented within a customized Viewer interface



## APIs Used:



Design  
Automation



Viewer

## CONFIGURE



# More Customer Stories from AU 2018

The screenshot shows the Autodesk University 2018 website. The header includes the Autodesk logo, navigation links for 'Create Account' and 'Sign In', and a search bar. The main content area features a large banner with the title 'Configure, Export, Generate: Stories from Design Automation for Inventor Beta Customers' and the speaker's name 'Andrew Akenson'. Below the banner, there is a sidebar with a search bar and a list of media types: Overview (selected), Video (47 min 29 sec), Presentation (0 slides), and Downloads (2 files). The main content area includes a 'DESCRIPTION' section, 'KEY LEARNINGS' (a bulleted list), and 'SPEAKERS' (a profile for Andrew Akenson). A thumbnail image of the class content is visible on the right side of the banner.

AUTODESK

AUTODESK UNIVERSITY

LAS VEGAS 2018 FORGE SOFTWARE SOFTWARE DEVELOPMENT

## Configure, Export, Generate: Stories from Design Automation for Inventor Beta Customers.

INDUSTRY TALK FDC225569

Andrew Akenson

Search this class

**Overview**

Video  
47 min 29 sec

Presentation  
0 slides

Downloads  
2 files

DESCRIPTION

Beta customers for the new Inventor Design Automation API will demonstrate their Forge applications and share their experiences. Each customer will describe how they've been able to automate Inventor API and iLogic workflows in Forge.

KEY LEARNINGS

- Learn about success on Forge firsthand from customers and partners
- Learn about which workflows can be automated with Inventor and Forge
- Discover how iLogic rules can drive configurations in the cloud
- Learn about what went well and what the challenges were in setting up a Forge app to drive Inventor

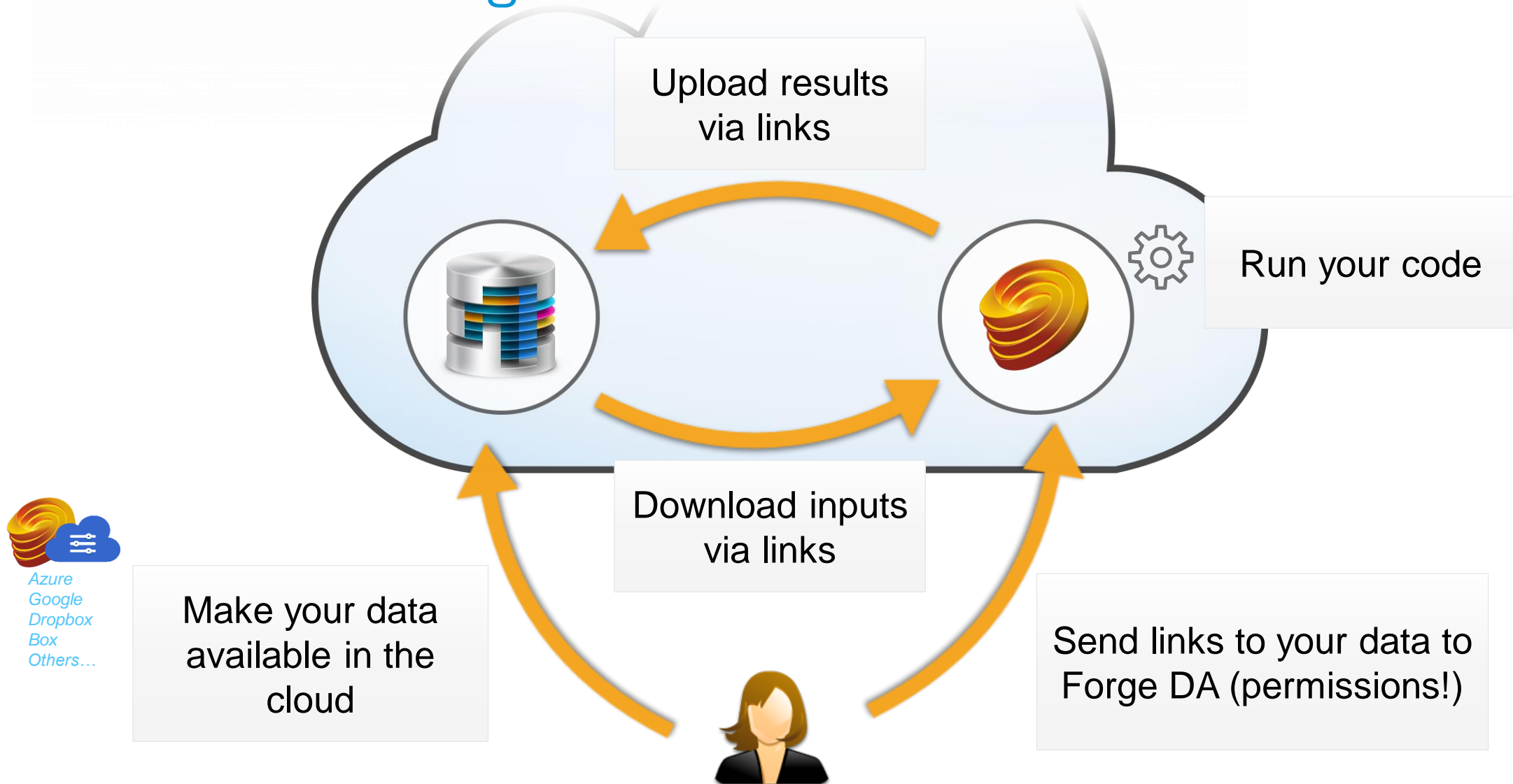
SPEAKERS

Andrew Akenson

<https://www.autodesk.com/autodesk-university/class/Configure-Export-Generate-Stories-Design-Automation-Inventor-Beta-Customers-2018>

# Bring Your Existing Code to Forge

# Data Processing on Demand





# Bring your existing automations to Forge

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Search AU LibraryDiscoverConferences

LAS VEGAS 2018FORGESOFTWARESOFTWARE DEVELOPMENT

Bringing your Inventor Add-in into Forge Design Automation

INSTRUCTIONAL DEMO SD225601

Andrew Akenson





Search this class

## Overview

Video  
1 hour

Presentation  
0 slides

## DESCRIPTION

Bring your existing Inventor Add-in into Forge. In this class we'll go through step by step conversion of an Inventor Add-in into a Design Automationfor Inventor AppBundle.

## KEY LEARNINGS

- Learn the steps it takes to convert your Inventor add-in into a plug-in
- Learn how to work with Design Automation v3 API

<https://www.autodesk.com/autodesk-university/class/Bringing-your-Inventor-Add-Forge-Design-Automation-2018>

# Inventor Engines



- Multiple Versions
- Run jobs in parallel
- Optimized for Inventor workflows
- iLogic and translator plugins loaded
- Custom plug-ins
- No license needed, just pay for use



- Limited Excel
- No sticky sessions
- No Application Add-ins (Frame Generator, T&P...)



## **Runs in a “sandbox”**

- One job per worker, nothing shared with anyone else
- Protects your code, protects our infrastructure
- No access outside of working directory

## **Quotas and Limits**

- Input and Output file size
- Job duration

# Public Beta Stats

Validating workflows, quotas and operational robustness

- Over 730K jobs in Public Beta, last month over 200K
- Over 50 customers trying it out
- Customers trying out all three major use cases



# Where To Go To Get Started

# Forge on Github

<https://forge.autodesk.com/GitHub>

**Forge Platform**  
Forge is a set of Autodesk APIs and services for software developers to build innovative cloud-powered applications.  
<https://developer.autodesk.com> | [forge.help@autodesk.com](mailto:forge.help@autodesk.com)

Repositories: 61 | People: 0 | Projects: 0

Find a repository... | Type: All | Language: All

- bim360-csharp-issues**  
BIM 360 Issues: This sample demonstrates the Document Issues API for BIM 360 using the built-in PushPin Viewer extension.  
Languages: jquery, csharp, viewer, data-management, net-core, jstree  
C# | 5 stars | 4 forks | MIT | Updated 7 hours ago
- forge-api-java-client**  
Forge Java SDK: Provides Java SDK to help you easily integrate Forge REST APIs into the application.  
Java | 17 stars | 17 forks | Apache-2.0 | Updated 2 days ago
- data.management-csharp-webhook**  
Webhooks for Data Management API: Use a database to store refresh token and access files (on BIM 360) later.  
Languages: csharp, webhook, asp-net, data-management, mongolab, net-core  
C# | MIT | Updated 3 days ago
- oauth-walkthrough-2.legged.auth**  
2-Legged Authentication walkthrough: Learn how to use two-legged authentication.  
JavaScript | MIT | Updated 3 days ago
- recap-walkthrough-photo.to.3d**  
Photo To 3D Walkthrough: Use the Reality Capture API to process photos...

**Top languages**  
JavaScript, CSS


**Most used**  
viewer, csharp, model-derivative, nodejs, autocad

**People**  
0 >  
This organization has no public members. You must be a member to see who's a part of this organization.

- C# Inventor example
- Postman collection
- Other Forge examples


# Forge Blog Posts

<https://forge.autodesk.com/blog>

[Success Stories](#)[Solutions](#)[Getting Started](#)[Documentation](#)[Community](#)[Support](#)[Pricing](#)

## Simple introduction to Design Automation for Inventor

Petr Broz  
November 5, 2018

[Success Stories](#)[Solutions](#)[Documentation](#)[Community](#)[Support](#)[Pricing](#)

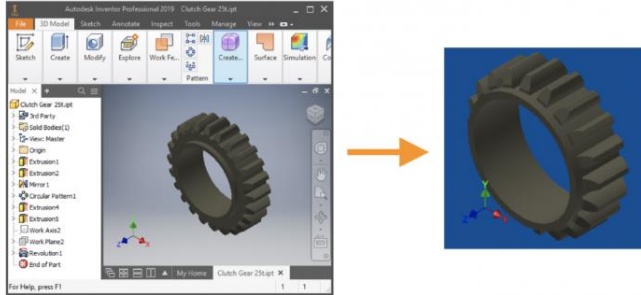
**Design Automation API (Beta) v3**

Developer's Guide

- Overview
- API Basics
- Field Guide
- Rate Limits and Quotas
- FAQs
- Troubleshooting

Step-by-Step Tutorials

API Reference






**What we'll need**

- *Inventor SDK* and *Visual Studio 2017* to build our Inventor plugin
  - See [Inventor docs](#) for more details on where the SDK is available in your Inventor installation
  - Visual Studio [Community Edition](#) will suffice
- HTTP client for configuring our pipeline using the new APIs
  - We'll be using [postman](#) and cURL syntax
  - If you prefer working with GUI, note that all the cURL examples in this article can be [imported into postman](#)

### Phase 1: Inventor plugin

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[Tips and Tricks \(92\)](#)

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[Viewer \(234\)](#)

[Data Management API \(79\)](#)

[Model Derivative API \(63\)](#)

[Authentication \(46\)](#)

[BIM 360 API \(33\)](#)


[Design Automation API \(17\)](#)

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# Find answers on StackOverflow

<https://forge.autodesk.com/Stack>


[Success Stories](#) [Solutions ▾](#) [Getting Started](#) [Documentation](#) [Community ▾](#) [Support ▾](#) [Pricing](#) [SIGN IN](#)

Get Help

## Find answers from StackOverflow

The Forge support team monitors StackOverflow for, and will answer, all questions marked with Forge-related tags. In many cases, members of the Forge developer community will also give you advice.

[Ask a question now!](#)

 **TIPS** | Here's how to get better answers. ▾

As the community grows and more questions are asked and answered on StackOverflow, you'll get better and better results when searching for what you need help with before having to post a thing:

About which API? ▴

Authentication (OAuth)

Data Management API

Design Automation API

Model Derivative API

Viewer


BIM 360 API

Reality Capture API

None



Code Samples

Videos & Slides

[SEARCH](#) 

Search results will open in a new browser tab.

### FOLLOW FORGE

-  Twitter
-  Facebook

### SOLUTIONS


- Data Management
- Design Automation
- Model Derivative & Viewer
- Reality Capture
- BIM 360
- Webhooks

### DOCUMENTATION

- Authentication (OAuth)
- Data Management
- Design Automation
- Model Derivative
- Viewer
- Reality Capture
- BIM 360

### ABOUT

- About Forge
- Pricing
- Success Stories
- Partners
- Forge Fund
- DevCon 2018
- DevCon 2017

 **AUTODESK® FORGE**

# Forge Community

## Community

Twitter: @AutodeskForge

Facebook @AdskForge

## YouTube:

<https://forge.autodesk.com/YouTube>

## Blog:

<https://forge.autodesk.com/blog>

## Design Automation for Inventor:

[InventorOnForge@autodesk.com](mailto:InventorOnForge@autodesk.com)

## Github

- [C# Basics Sample](#)
- [Postman collection](#)
- [Forge](#)

# Accelerators Coming Soon!



# Accelerator Info

<http://autodeskcloudaccelerator.com/>

Tokyo, Japan – July 16-19

New York City, NY – September 9-13

Las Palmas, Gran Canaria – October 21-25

Paris, France – December 9-13