Turning Days Into Minutes

Inventor Design Automation on Forge

Loren Welch

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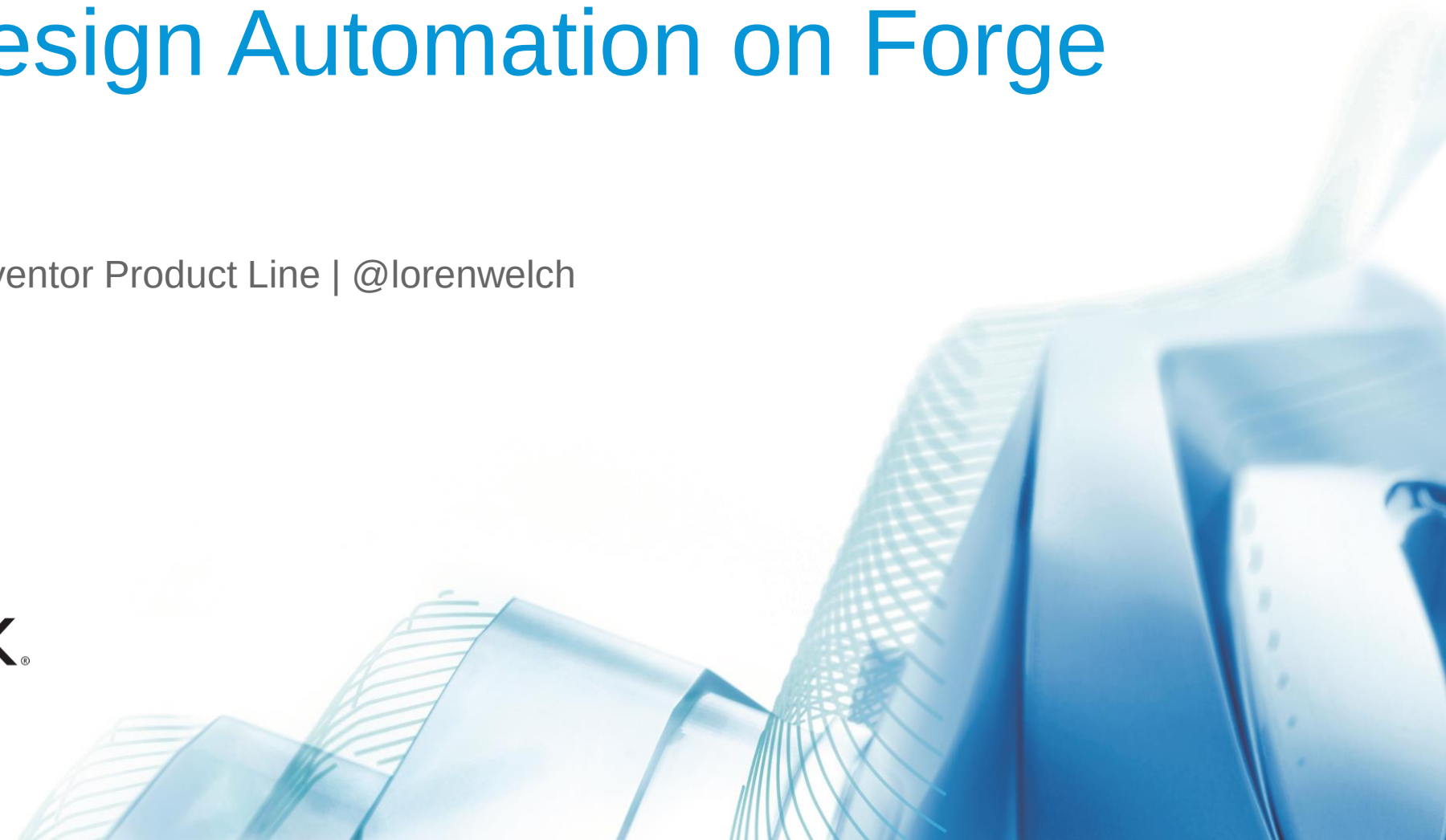
AUTODESK. UNIVERSITY



The Forge Platform

AUTODESK® FORGE

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.

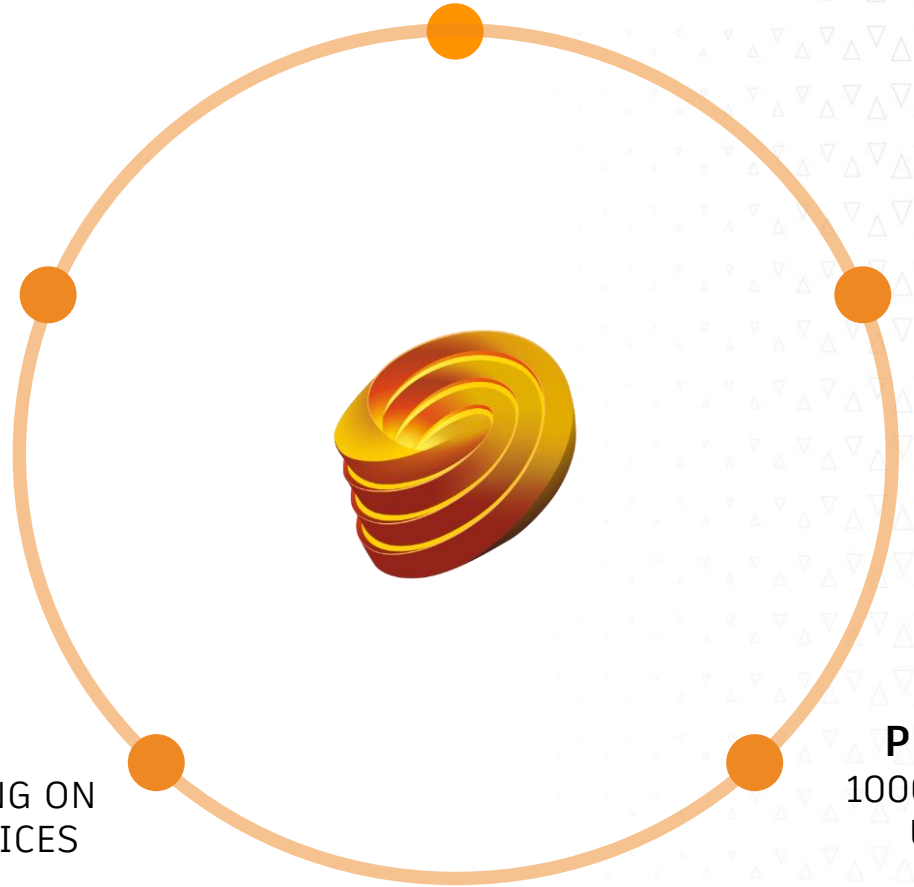
Forge can:

- 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

RELIABLE AND SECURE
HOSTED ON AWS
SOC2 CERTIFIED
US AND EU DATA CENTERS

BUILT TO SCALE
FORGE ALREADY HANDLES OVER
3 BILLION API CALLS PER MONTH



STANDARD WEB TECHNOLOGIES
REST AND JAVASCRIPT

AUTODESK COMMITMENT
400 AUTODESK DEVELOPERS WORKING ON
DEVELOPING THE CORE FORGE SERVICES

PROVEN TECHNOLOGY
1000 AUTODESK DEVELOPERS
USE FORGE EVERY DAY

AUTODESK® **FORGE**

FORGE COMMUNITY BY THE NUMBERS

40,000+ monthly website visitors

1500+ active developer accounts

22 Forge Certified Systems Integrators

90+ enterprise customers are evaluating Forge

AUTODESK® **FORGE**

- SECURE
- SCALABLE
- RELIABLE
- GROWING

AUTODESK® FORGE


FORGE OFFERING

Data Management API

Reality Capture API

Design Automation API

BIM 360 API

Model Derivative API & Viewer

Webhooks API

Design Automation

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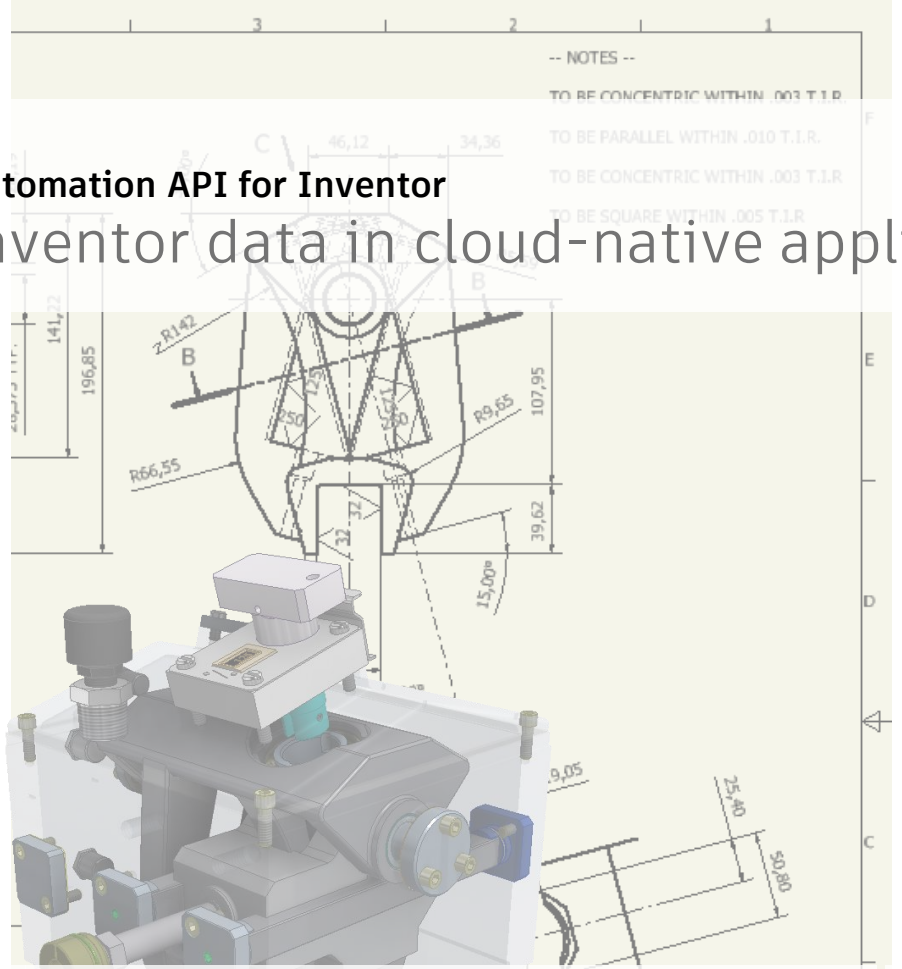
Design Automation API for Inventor

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

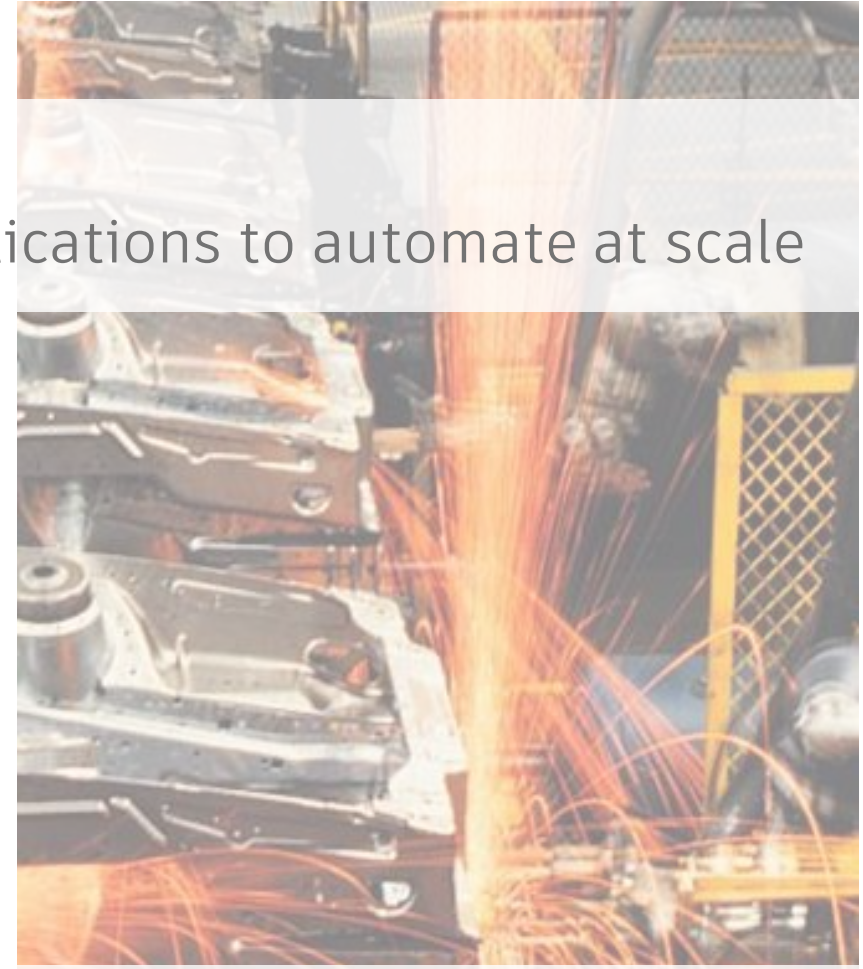
Configure

- Engineering Automation
- Sales Configuration
- iLogic



Export

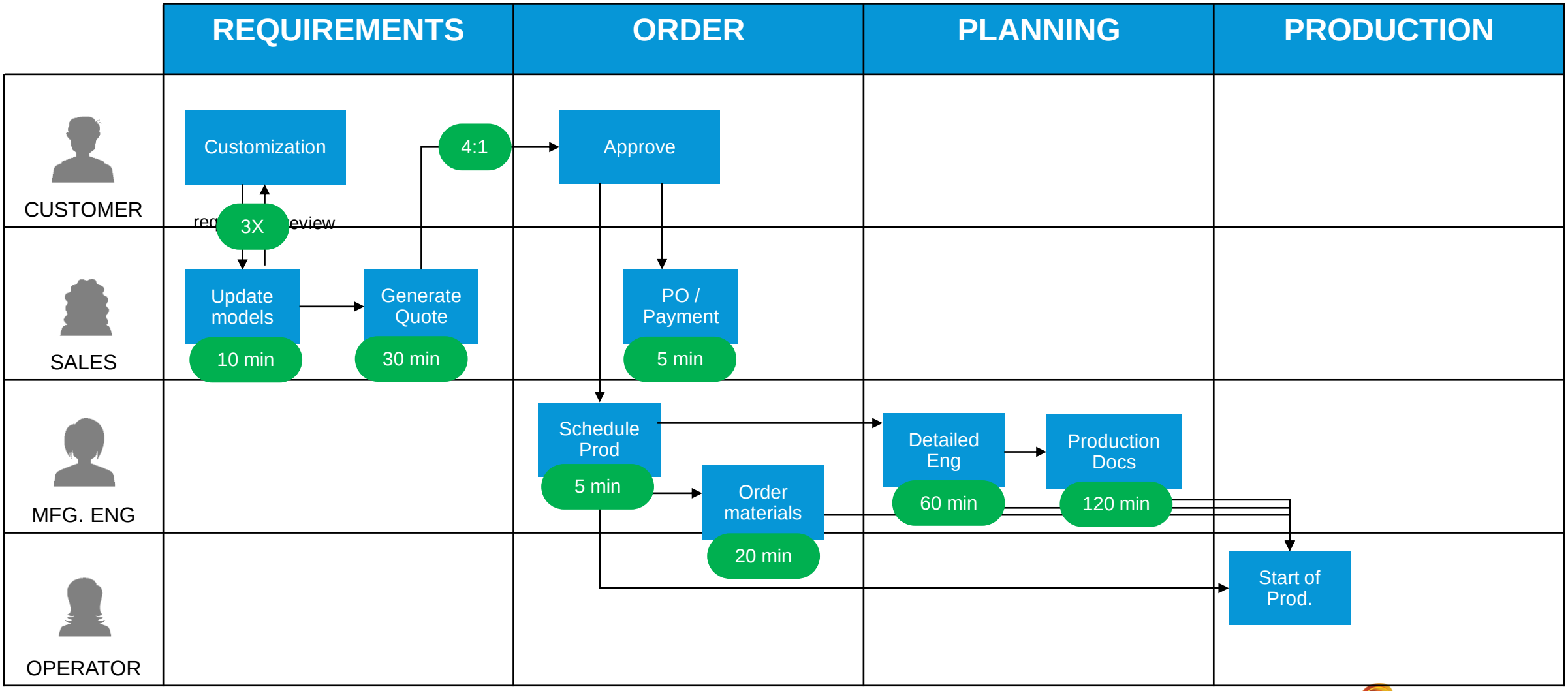
- CAD Formats
- Drawings
- BOM
- Custom Interop



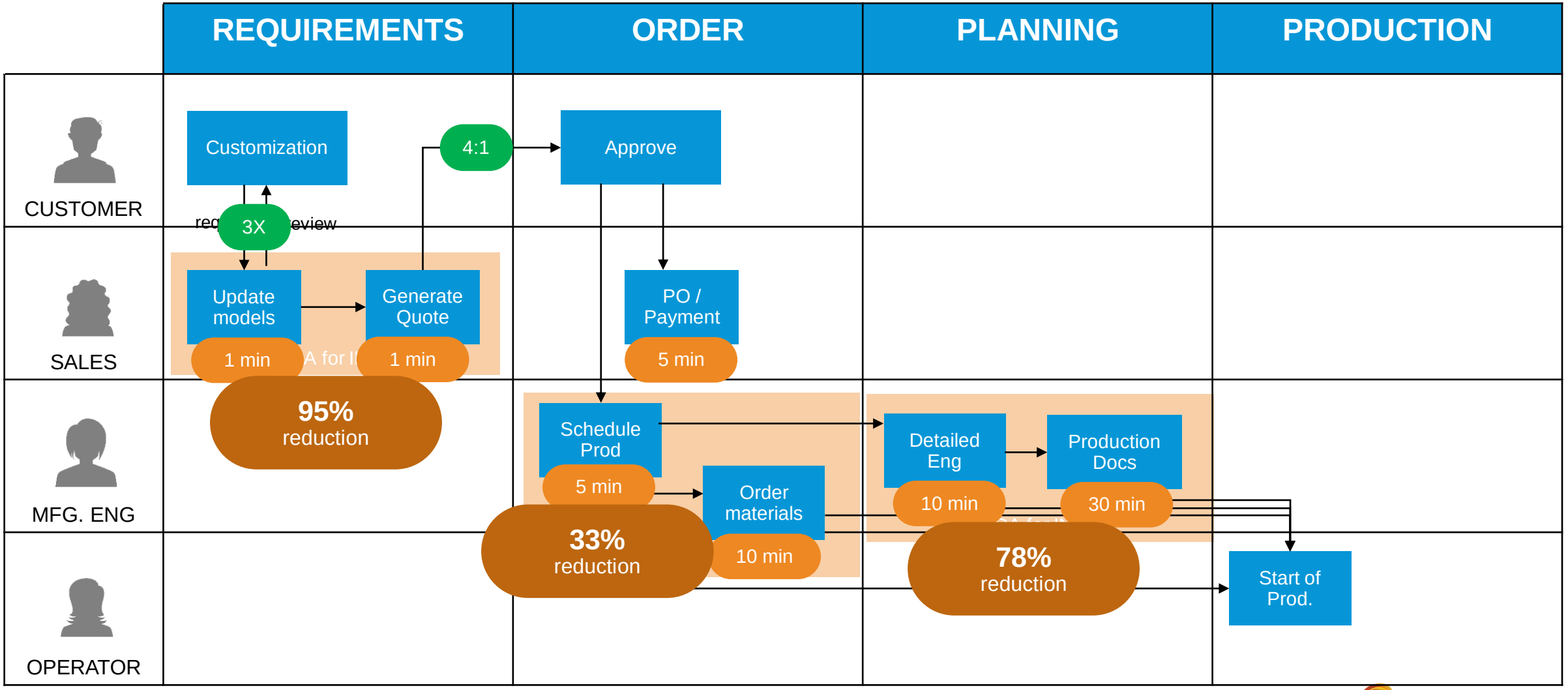
Generate

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

Typical Workflow: Manual Processes



Typical Workflow: OPPORTUNUTY TO AUTOMATE



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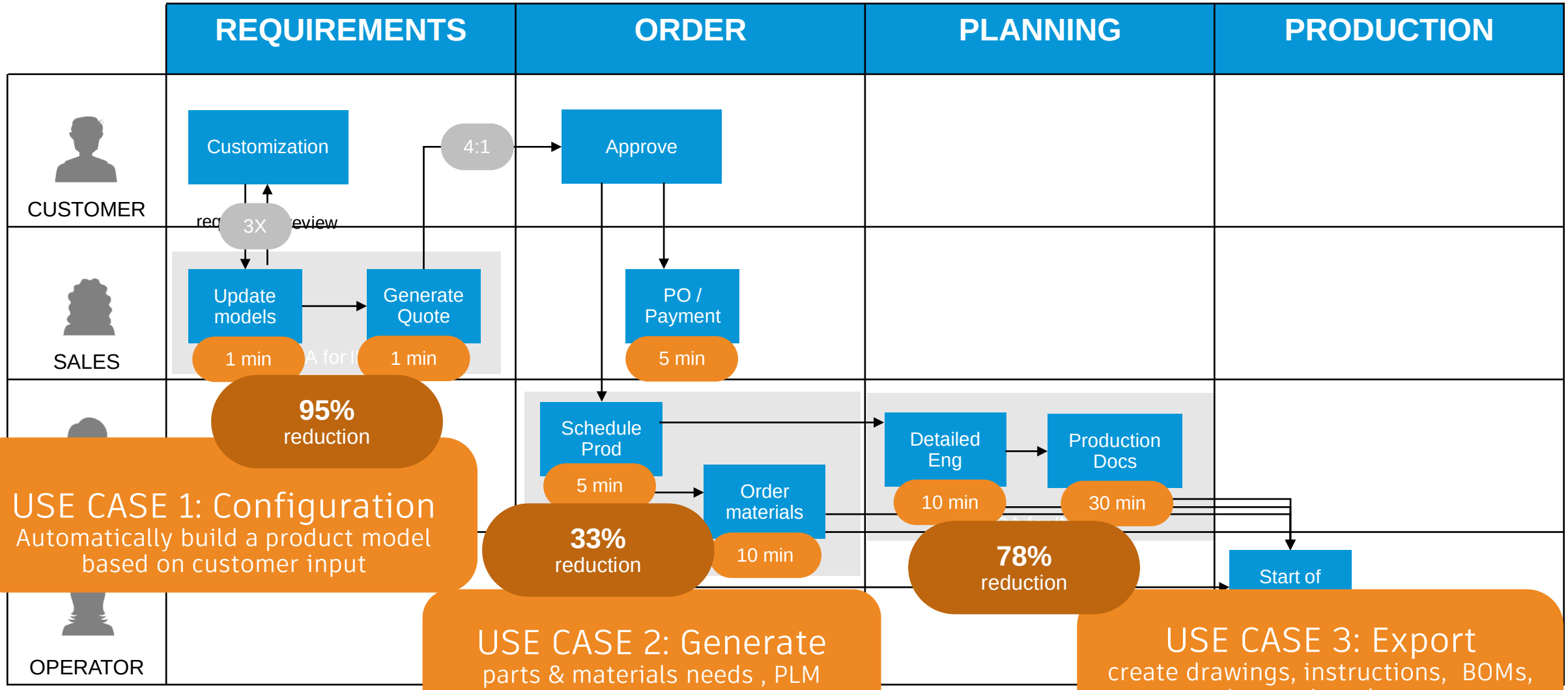
Typical Workflow: OPPORTUNUTY TO AUTOMATE



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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

USE CASE 3: Export
create drawings, instructions, BOMs, inspection plans

USE CASE 2: Generate
parts & materials needs , PLM integration

Configure

- Engineering Automation
- Sales Configuration
- iLogic

Export

- CAD Formats
- Drawings
- BOM
- Custom Interop

Generate

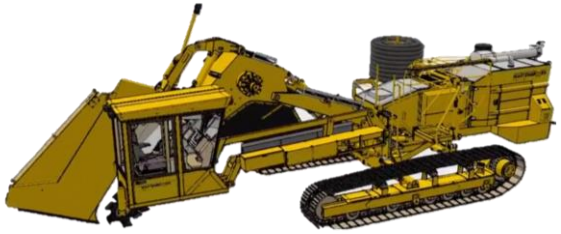
- Design Alternatives
- Product Families
- Model Validation
- Bulk Operations

Design Automation API V3

Run automations on your design files

AUTODESK® **REVIT**®

AUTODESK® **INVENTOR**®



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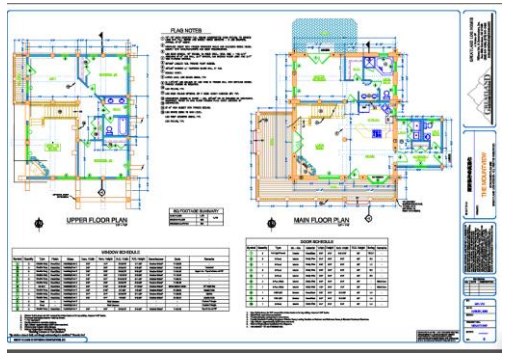
AUTODESK® **AUTOCAD**®



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Example Customers
Validating Identified Use Cases

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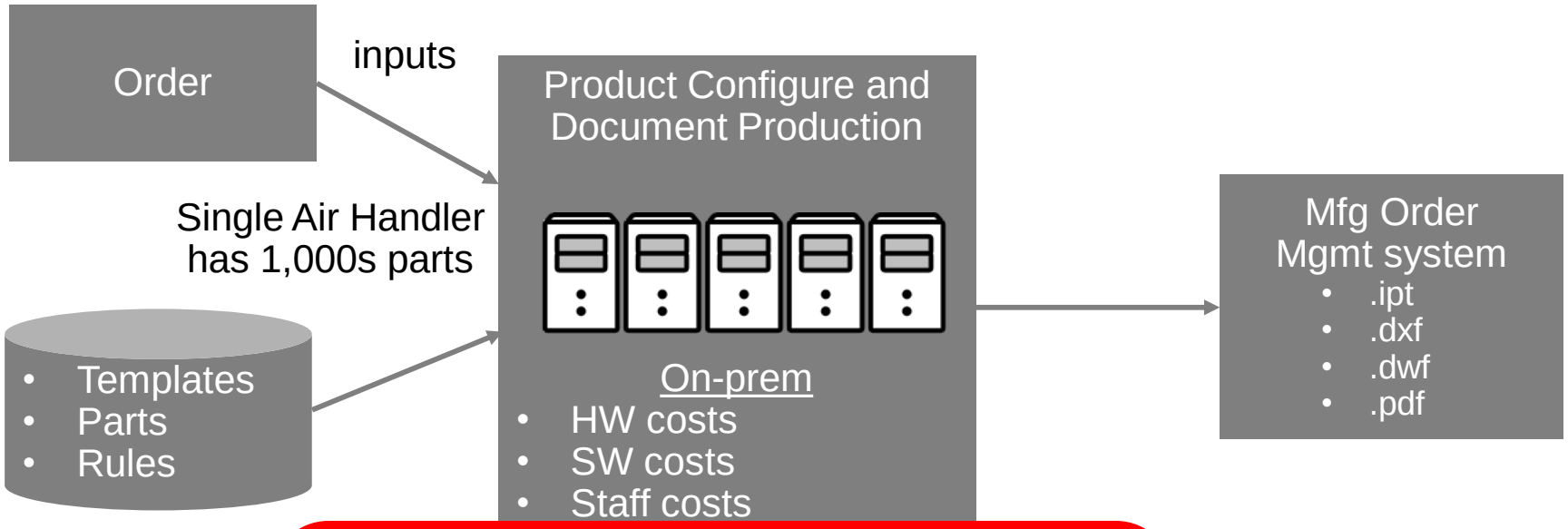
Example: HVAC Company

Current Product Configuration and Mfg. Document Preparation Process



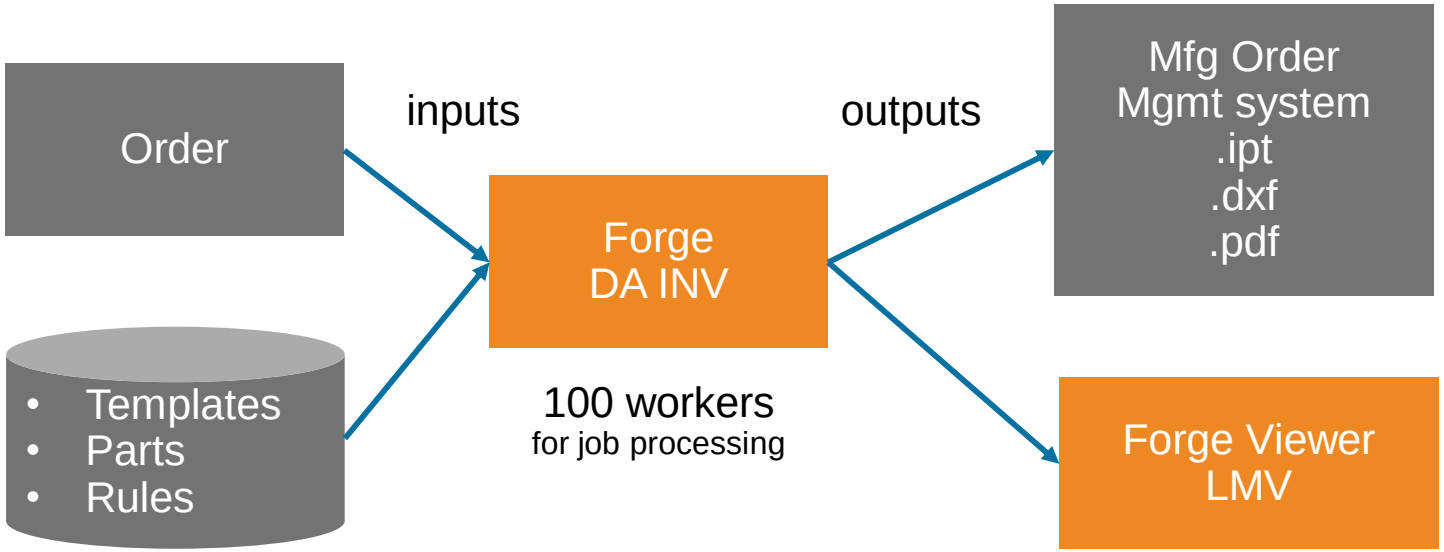
Job Completion in DAYS

- 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



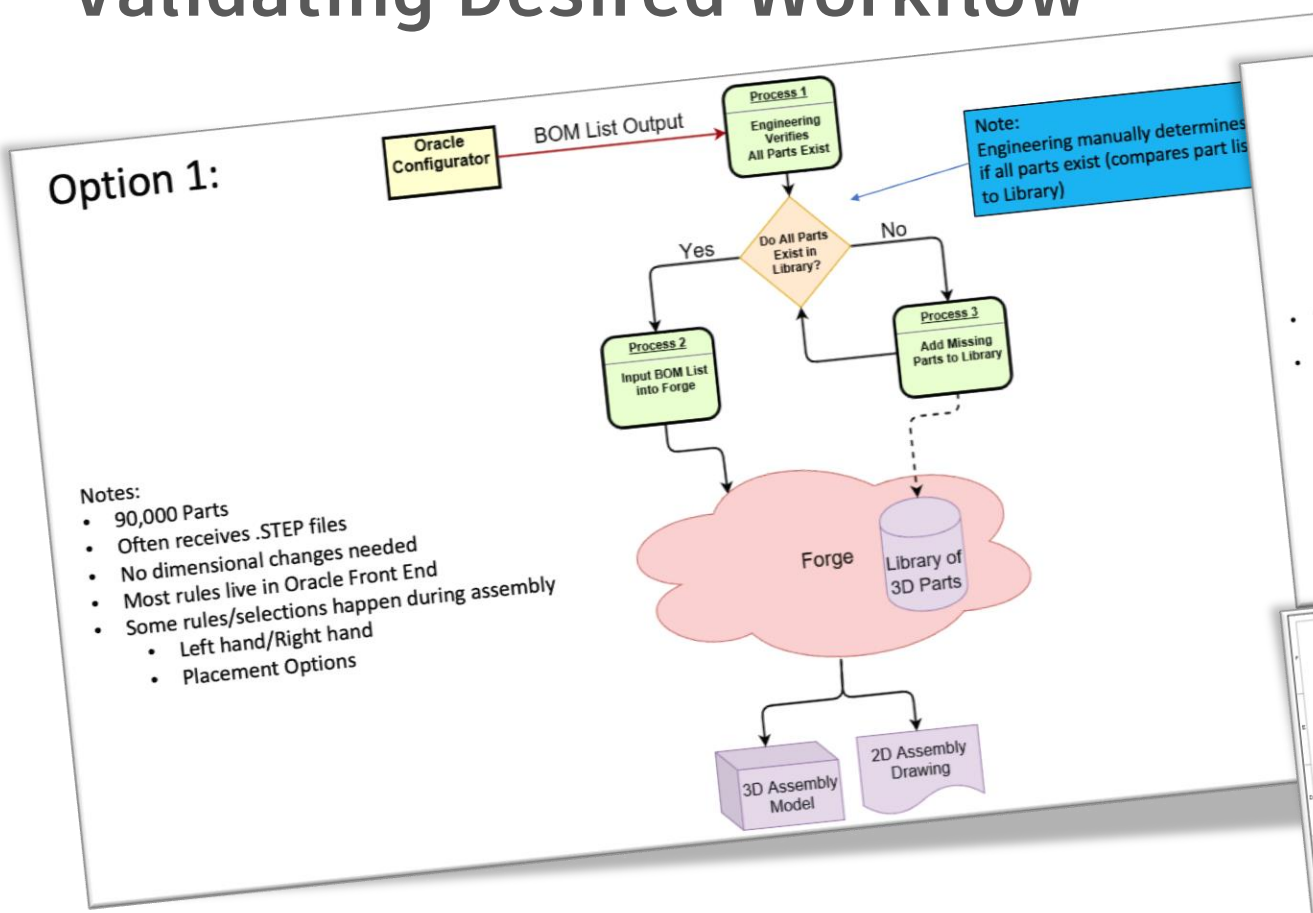
Job Completion in MINUTES

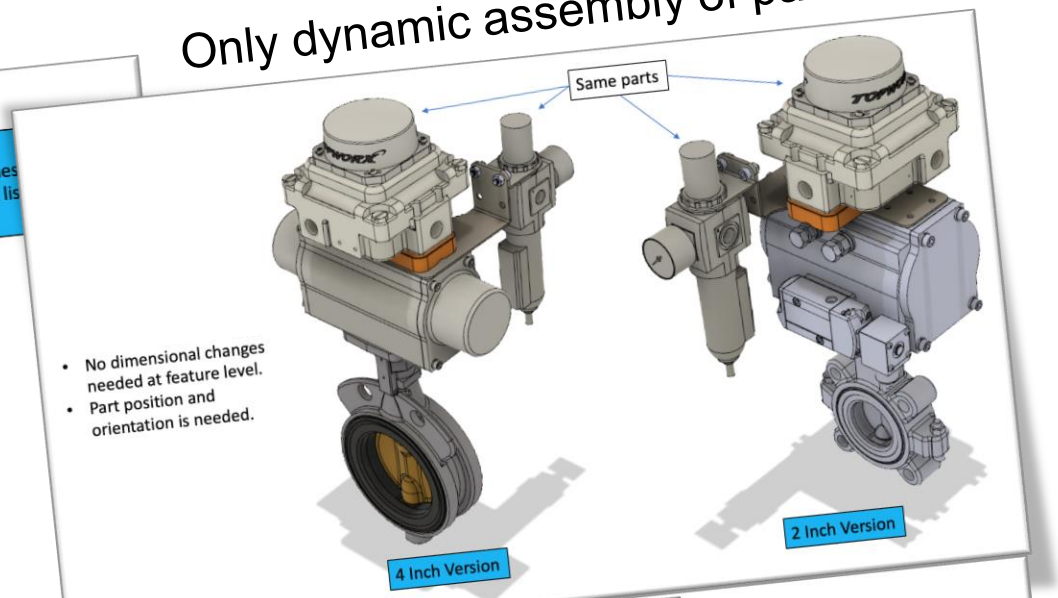
RESULTS ACHIEVED:

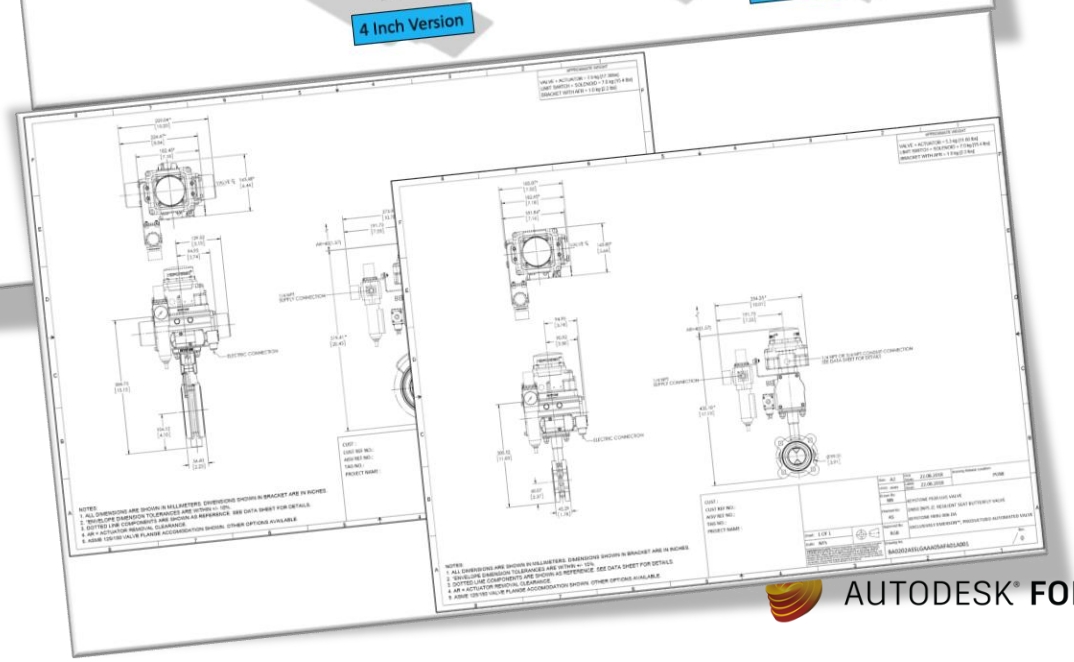
1. Reduced job time by several orders of magnitude
2. Removed ADR, use Forge Viewer
3. Not dependent on on-prem, reduce SW and Opex Costs

Example: Valve Company

Validating Desired Workflow







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Clean Room Filtration Configurator

Who

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

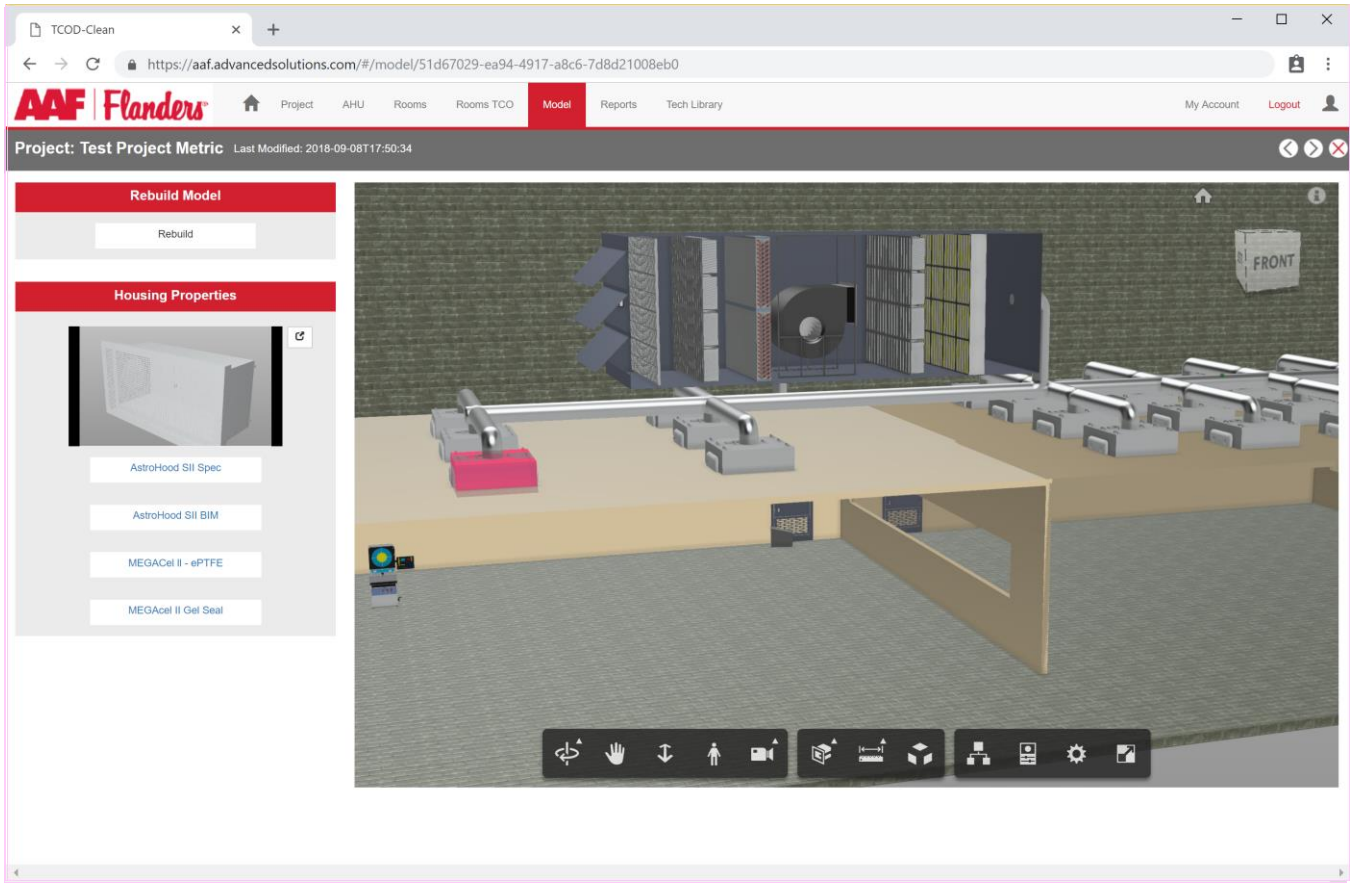
Situation

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

Advanced SOLUTIONS SINCE 1987



APIs Used:

Design Automation

Viewer

CONFIGURE

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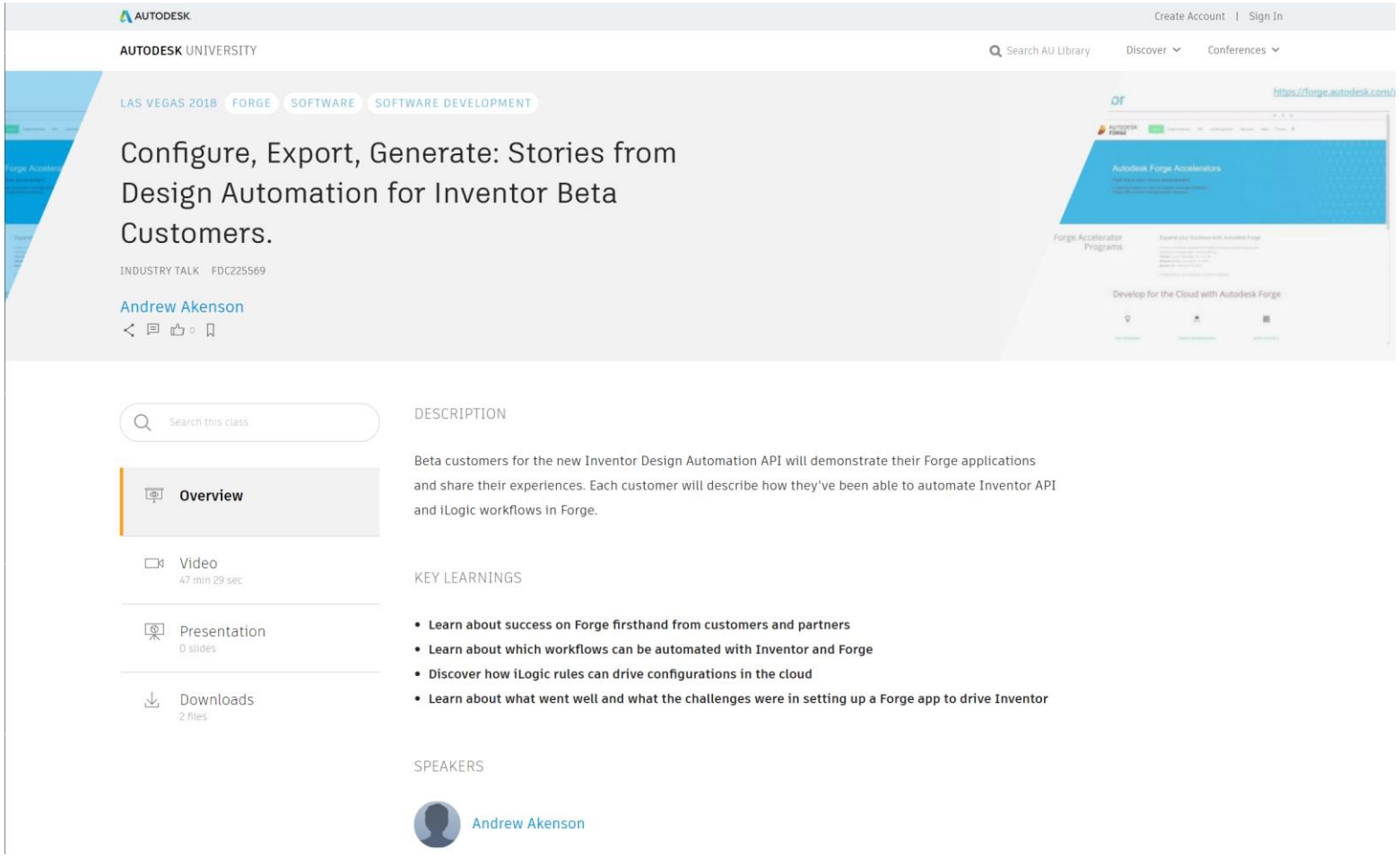
More Customer Stories from AU 2018



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

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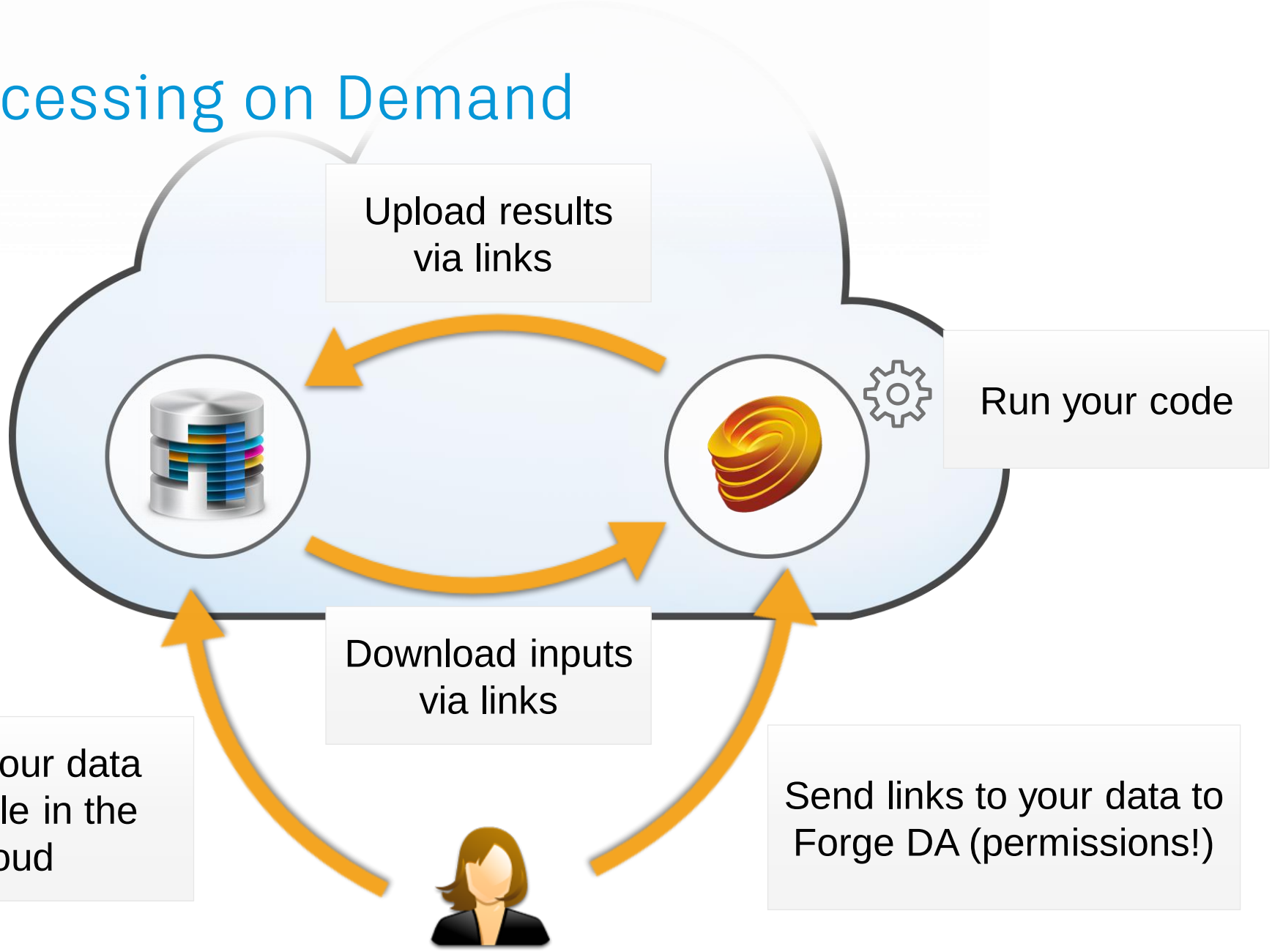
Bring Your Existing Code to Forge

Data Processing on Demand



ⓘ Input/outputs are **NOT** stored, they are downloaded/processed and **DISCARDED**

AUTODESK® **FORGE**

Bring your existing automations to Forge

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

AUTODESK® FORGE

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

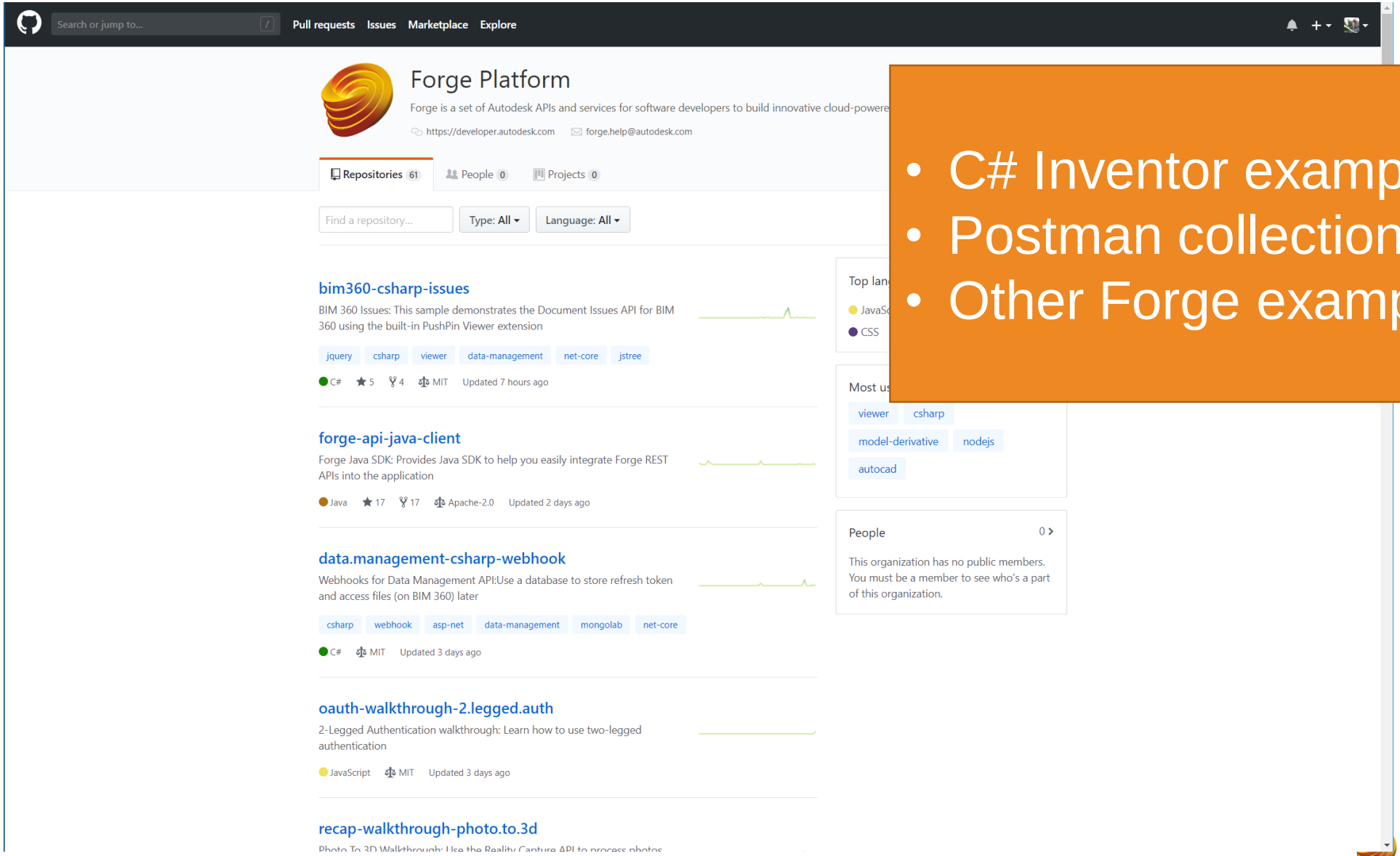
Validating workflows, quotas and operational robustness

- 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



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

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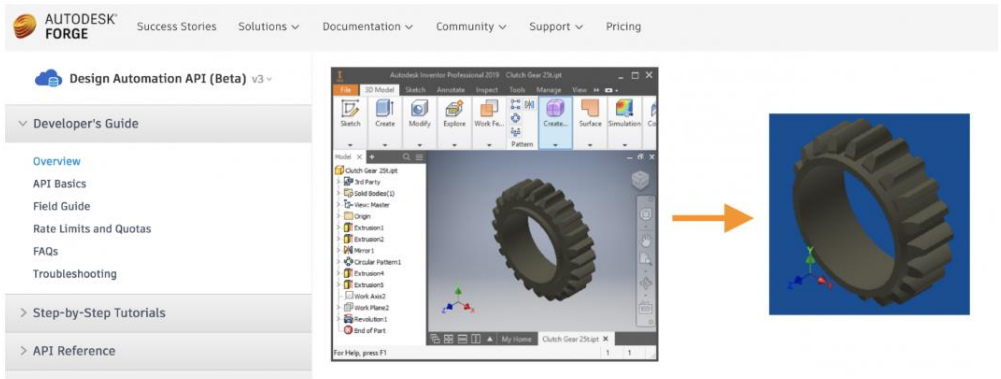
Forge Blog Posts

https://forge.autodesk.com/blog

AUTODESK FORGE | Success Stories | Solutions | Getting Started | Documentation | Community | Support | Pricing

Simple introduction to Design Automation for Inventor

Petr Broz
November 5, 2018



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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C# (36)

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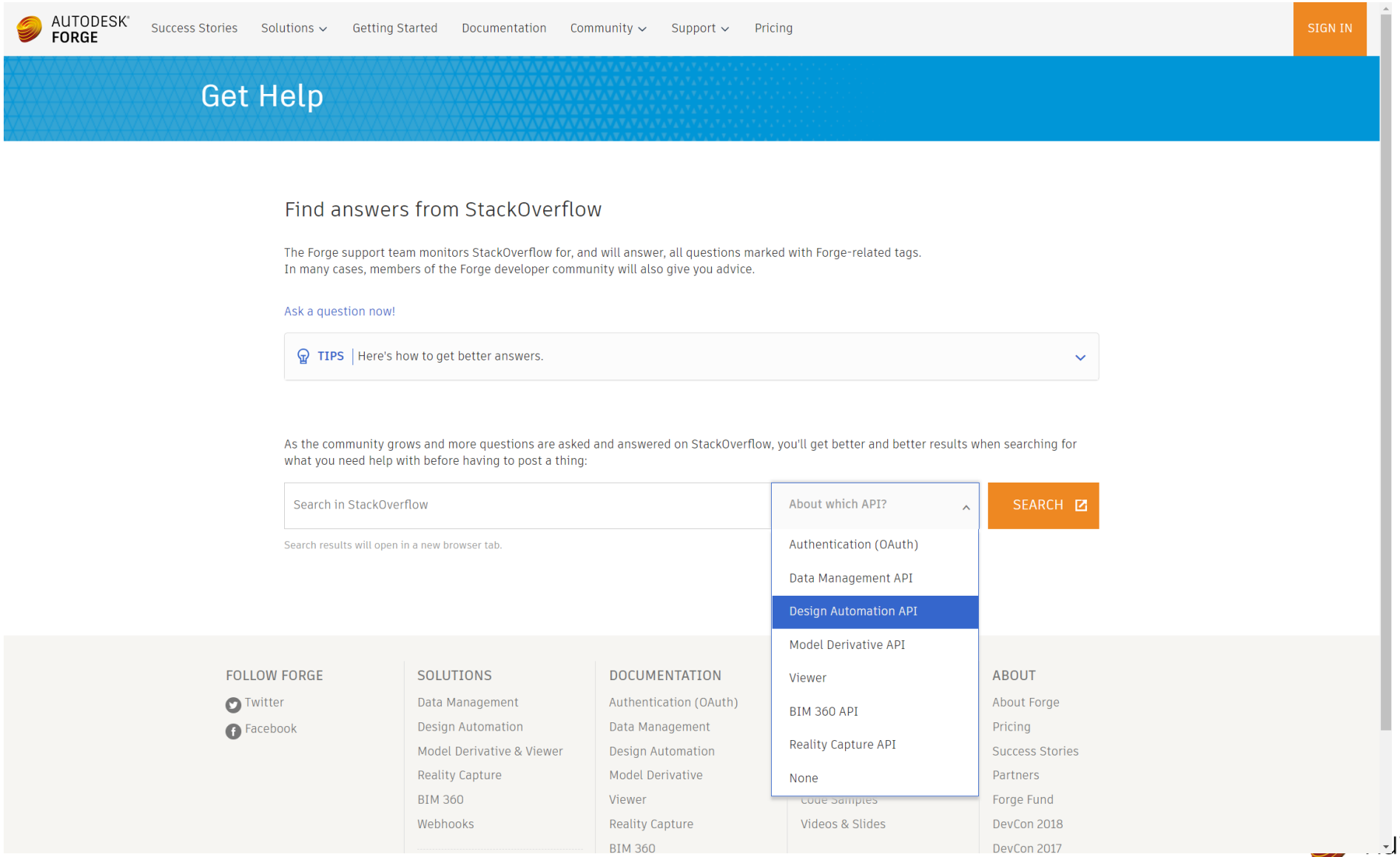
Find answers on StackOverflow

https://forge.autodesk.com/Stack



Forge Community

Community

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YouTube:

https://forge.autodesk.com/YouTube

Blog:

https://forge.autodesk.com/blog

Design Automation for Inventor:

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