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Accelerating Engineering Workflows in the Process Industry with Autodesk Forge

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Learning Objectives

- Learn about how cloud platforms enable digital transformation.
- Learn about CAD configuration workflows through Autodesk Forge.
- Learn how, as an Emerson customer, you can connect a digital thread.
- Learn how “starting digital” enables the future with digital twins.

Description

Are you struggling to maximize all the benefits of going digital? Like many industries, the process industry struggles in the adoption of the efficiencies of digital. Whether designing a plant from scratch, modifying an existing installation, or upgrading old equipment—vendor and EPC collaboration for a single equipment tag can still take hours, stacks of printed paper drawings are still supplied in submittal, and CAD assets can be disconnected or are sometimes unavailable. Learn how Emerson has maximized Autodesk Forge software to help accelerate industry digital transformation by improving the digital customer experience. Autodesk Forge is the platform that connects enterprise resource planning (ERP), product lifecycle management (PLM), and business logic—providing a complete CAD configuration experience on MyEmerson and Emerson.com. Learn also how this digital platform backbone enables a future of asset management, design automation, common data environments, IoT visualization, and digital twins.

Speaker(s)

Jessica Soloway
My Emerson career spans work in technical support, sales, product management, and envisioning, designing, and curating the digital customer experience. Today as a Senior Digital Strategist I have driven accomplishments by leading the digital strategy for the Emerson engineering tools programs.

Tom Closs
I am a Solution Architect with Autodesk Consulting, with over 20 years of experience in creating solutions to solve challenges engineers and designers face every day. With expertise in data management, manufacturing, and software development, I have implemented solutions using AutoCAD, Inventor, Revit, Vault, Fusion Lifecycle, Forge, 3D Studio MAX, SAP, Documentum, and others.

Prior to joining Autodesk, I spent time as a Mechanical Designer, designing automated machines, tool fixtures and dies. Throughout my career I have implemented solutions for manufacturing, home building, utility design, and civil design. I also spent several years in the reseller channel designing and leading integrations involving multiple design and enterprise systems, streamlining customer processes to gain efficiencies and competitive advantages.

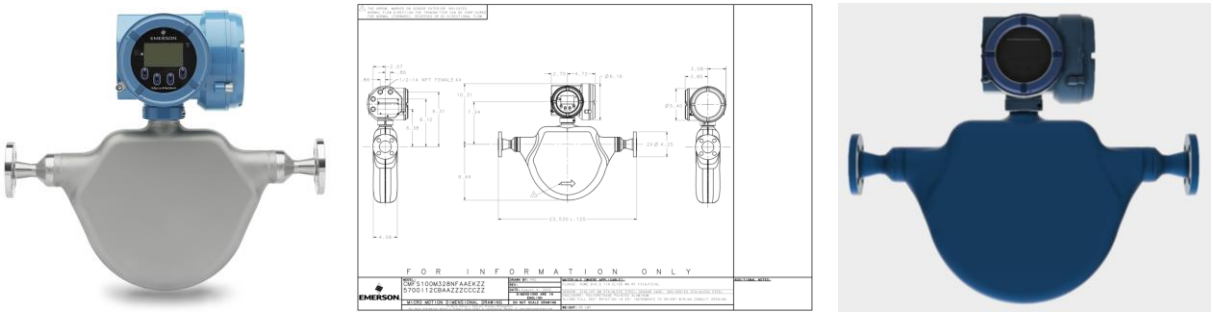
Introduction

Emerson Automation Solutions is a global supplier of technologies and services that help process, hybrid, and discrete manufacturers measure, analyze, control, automate, and optimize production, processing, and distribution. They have one of the most complete automation portfolios in the industry, with the depth of services to back it up. They serve many different industries including Life Sciences & Medical, Chemical, Power, Food & Beverage, and Oil & Gas. Industry-leading brands include Rosemount & Micro Motion measurement instrumentation, PlantWeb, Fisher valves, DeltaV, Ovation & AMS Suite software and systems, Asco & Aventics fluid control and pneumatics, and Appleton lighting.

The Challenge

As a hardware manufacturer, Automation Solutions produces thousands of different products with billions of customizable combinations. Each year they are adding new product offerings and options, maintaining legacy products, and obsoleting old products; essentially their product offering is not only extensive, but it is very complex.

Many of Automation Solutions' customers need access to 2D dimensional drawings and 3D CAD models. These drawings and models are required by their customers for many reasons, including using the models in initial plant designs or using the dimensional drawings to make sure the product will retrofit into an existing installation. Each year Automation Solutions receives hundreds of thousands of requests for these 2D drawings and CAD models. Meeting their customers' needs was difficult because 80% of the requests involved resource intensive processes and coordination between global cross-functional teams. Because of the step-by-step manual processes, turnaround times were not being met, customers were upset, and internal resources were spending a significant amount of time navigating several engineering applications that supported different products.



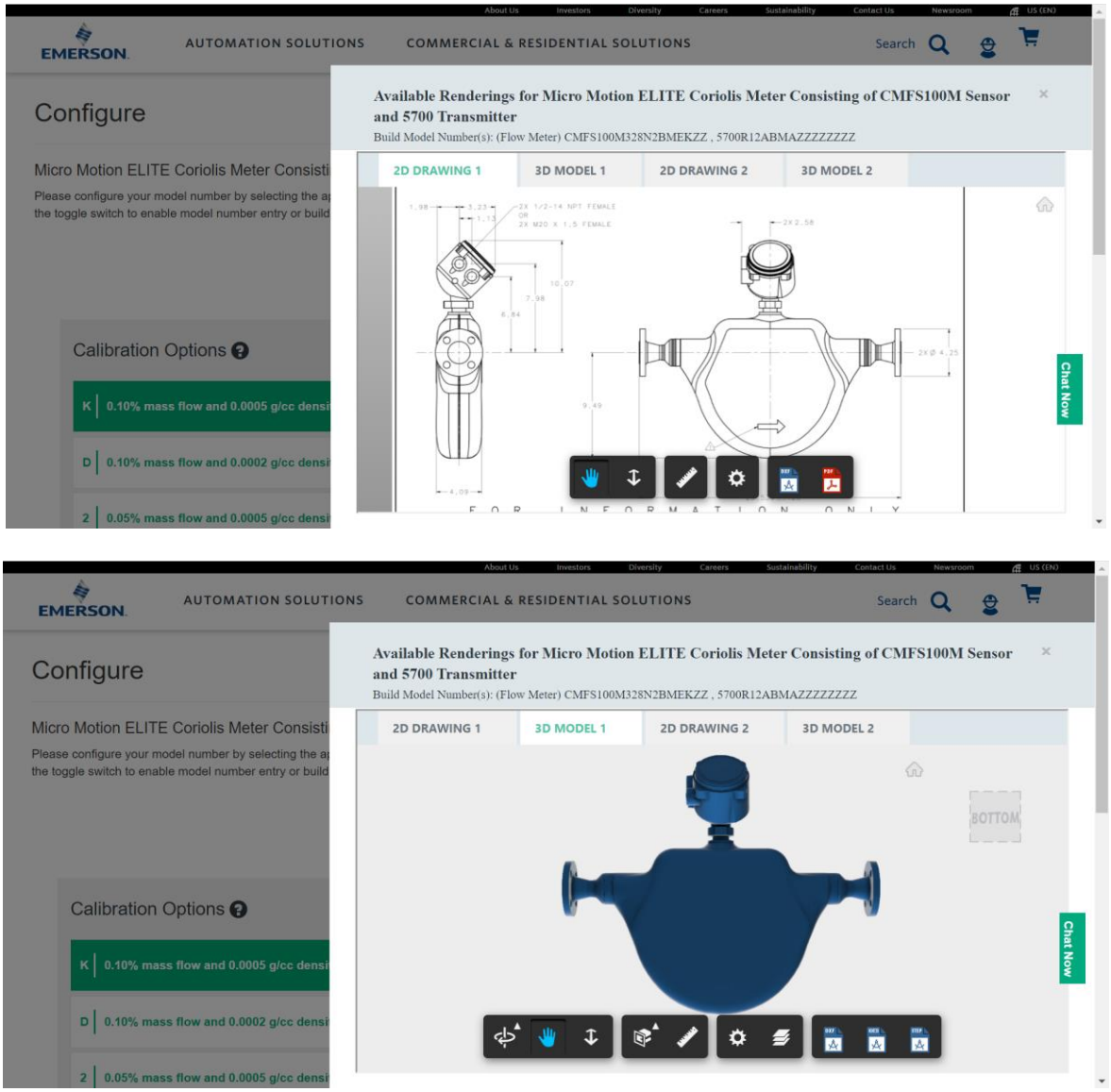
Left to right: Example of a Micro Motion Coriolis flowmeter and it's representative 2D dimensional drawing and 3D CAD model.

Automation Solutions needed to find a way to meet their customer expectations and went searching for a solution. They needed to find something that would work with multiple different backend systems without requiring any host system changes and must be scalable and sustainable to meet their growing business needs.

The Solution & Benefits

Automation Solutions partnered with Autodesk after learning about the Autodesk Forge platform. Utilizing the Forge platform, they are now able to provide their customers with a self-

service digital platform on Emerson.com that provides 2D drawings and 3D CAD models. Not only can their customers download the files immediately to their device, but they can also interact with the models within Forge Viewer. Utilizing the 2D/3D viewer on Emerson.com, Automation Solutions' customers are now able to receive this important information 94% faster than traditional methods. It has been a big win for the business and their customers. Additionally, the Autodesk Forge platform also helped Automation Solutions solve some other internal challenges.



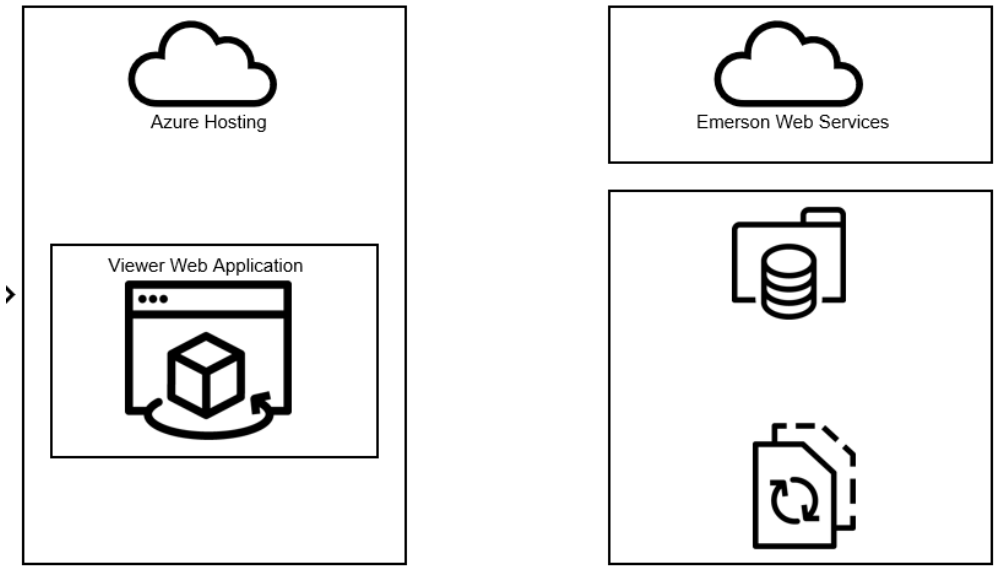
Autodesk Forge Viewer frame embedded in Emerson.com

With thousands of different products and billions of customized configurations, being able to scale across this complexity was very important for Automation Solutions. They needed a solution that would provide flexibility and help them solve the complexities of their business. One of the biggest internal benefits the Autodesk Forge platform brought to them was the scalable API architecture. Using API architecture, they can easily scale this solution to support the needs of their customers and extensive business. They are able to expand this capability to more products at a much faster pace.

Different Automation Solutions product lines were supported by different engineering applications and moving to a cloud solution let them be CAD system agnostic. Now they only need to create APIs to serve up the content and do not have to touch any host systems. The architecture also utilizes a caching scheme that improves performance by saving requested files to a database that can be instantly accessed for any subsequent requests. This means that their customers can receive their drawing/model request for the customized product in a matter of seconds. The cache is also monitored, and drawings and models are removed that are out-of-date to ensure that their customers are always getting the most current information.

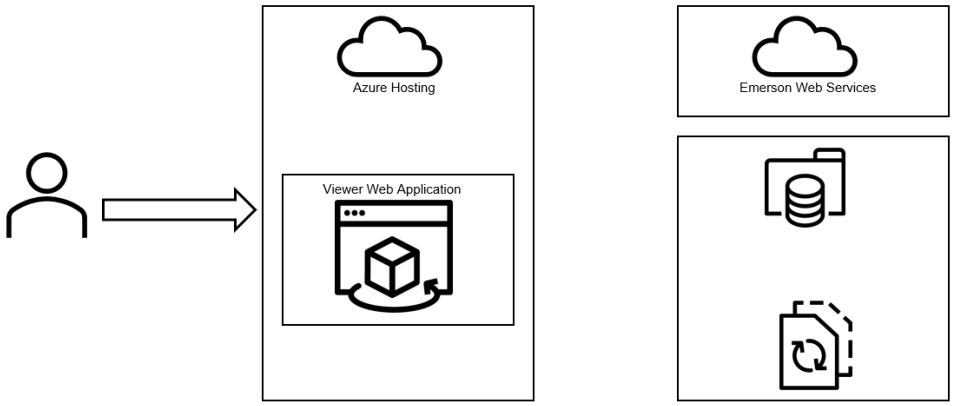
Technical Overview

The solution designed to meet Emerson's needs was a combination of Autodesk technologies, SAP, and backend integration developed by Emerson. The Autodesk technologies utilized were the Forge Viewer, AnyCAD, the Forge Model Derivative services, and OSS buckets of BIM 360.

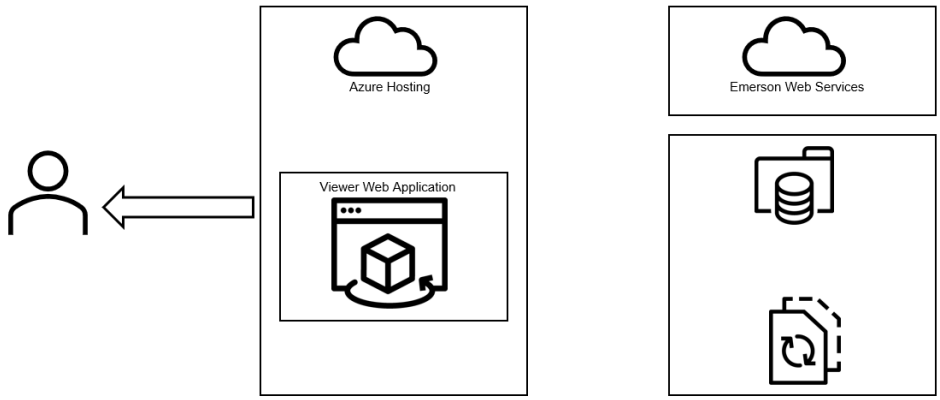


The process and interactions allow a user to configure a product and obtain the downloadable assets directly from Emerson's website.

From the Emerson website the user configures a product and submits the product code to get the assets.

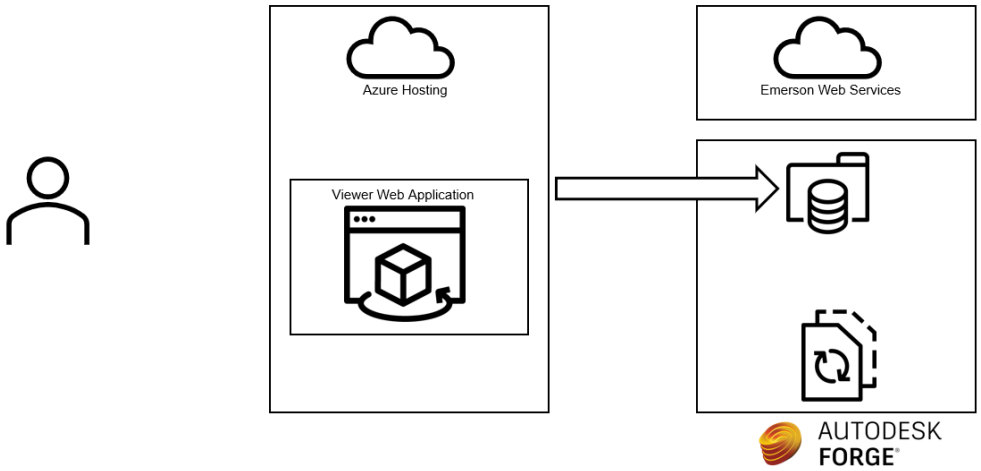


If the model configured is not a valid product, the user is informed via a message and the Emerson team is notified that a product failed to deliver assets.

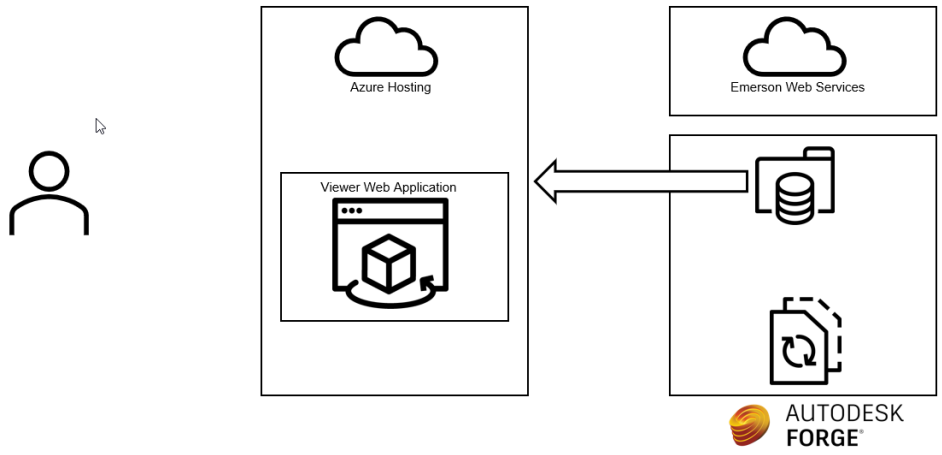


From here the Emerson team can determine if this is an error in the configurator or if a product configuration needs to be added to the system.

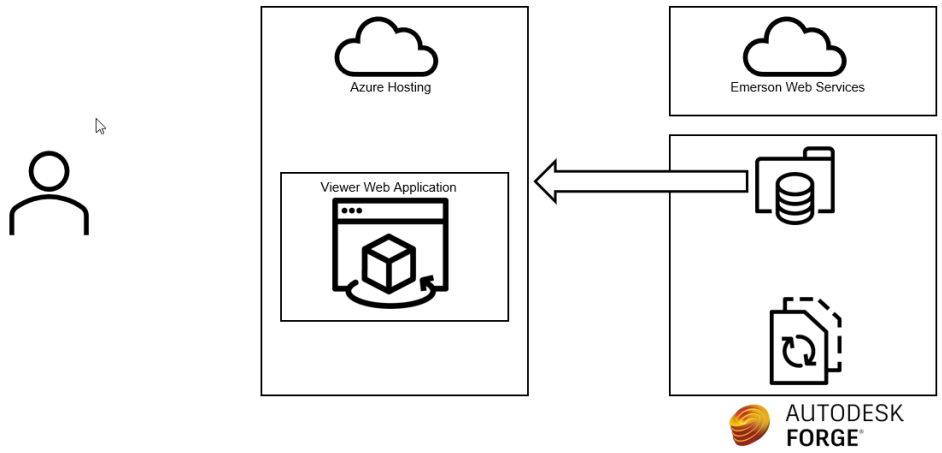
If the configuration is good the next step is checking if the configuration is in the cache.



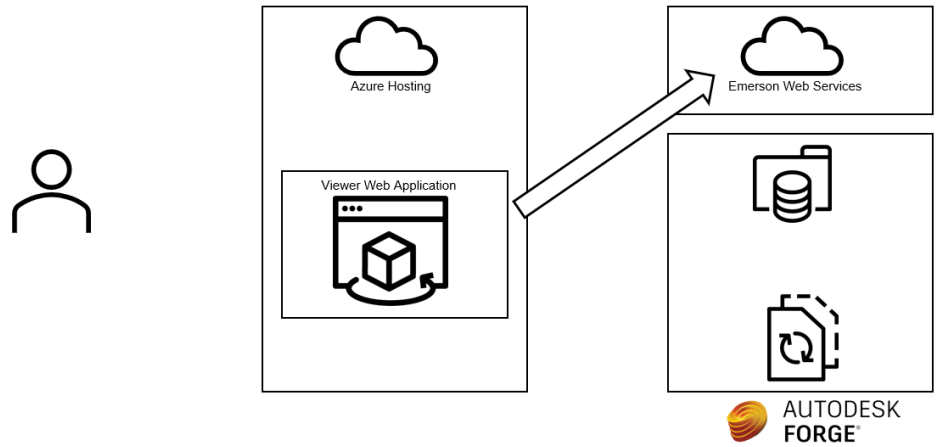
If the assets are cached, they are returned -



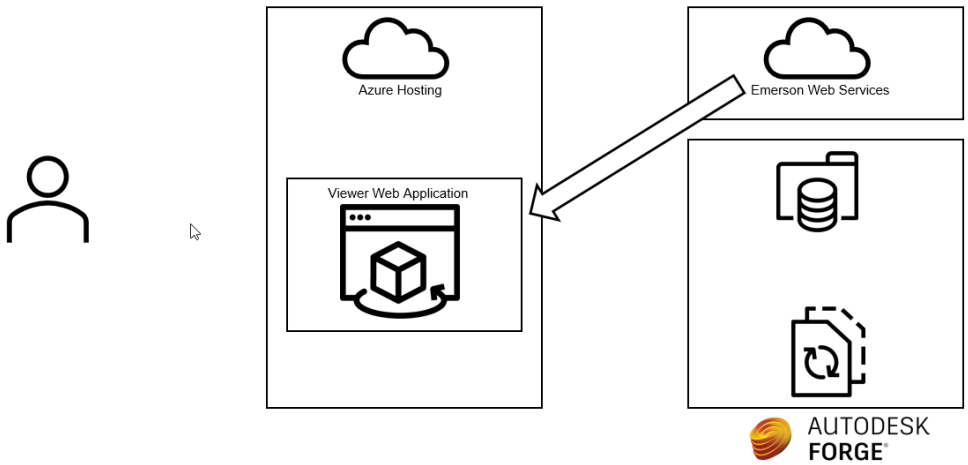
- then displayed to the user.

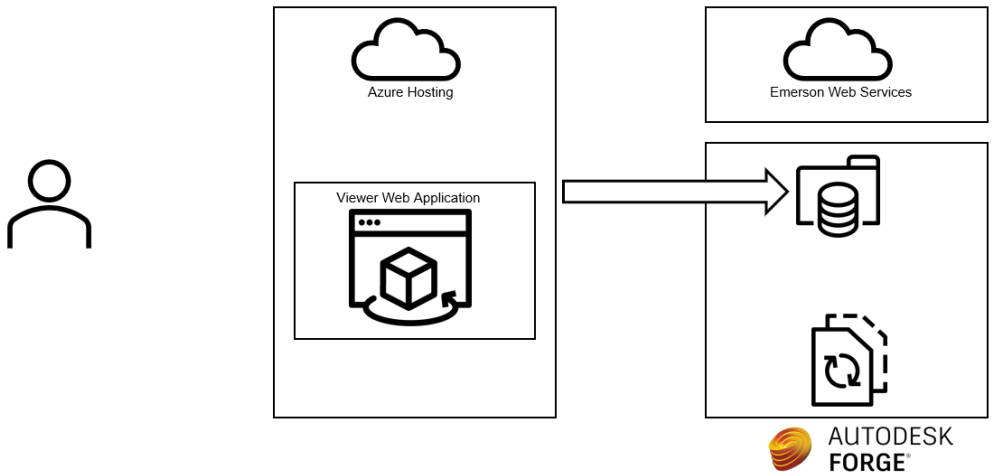


If the assets do not exist in the cache the web application makes a request to the Emerson backend services for the source files.

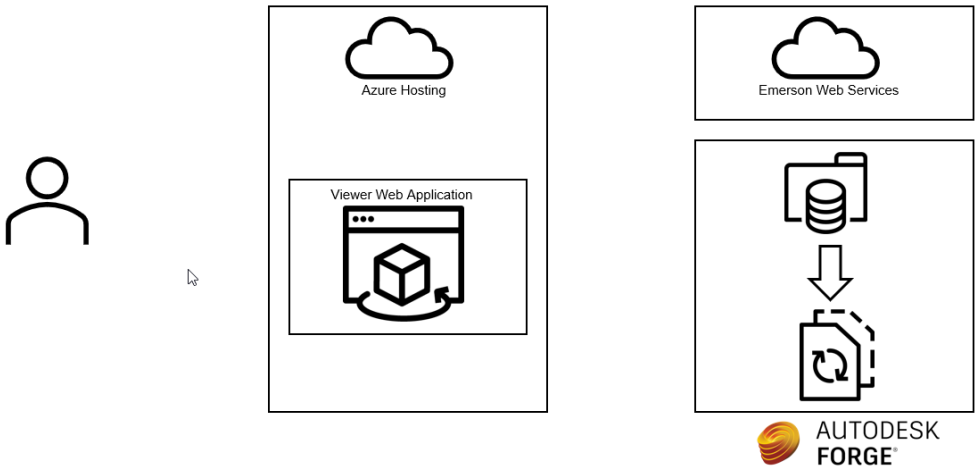


Once the files are received by the web application, they are stored in the OSS bucket (cache) for use.

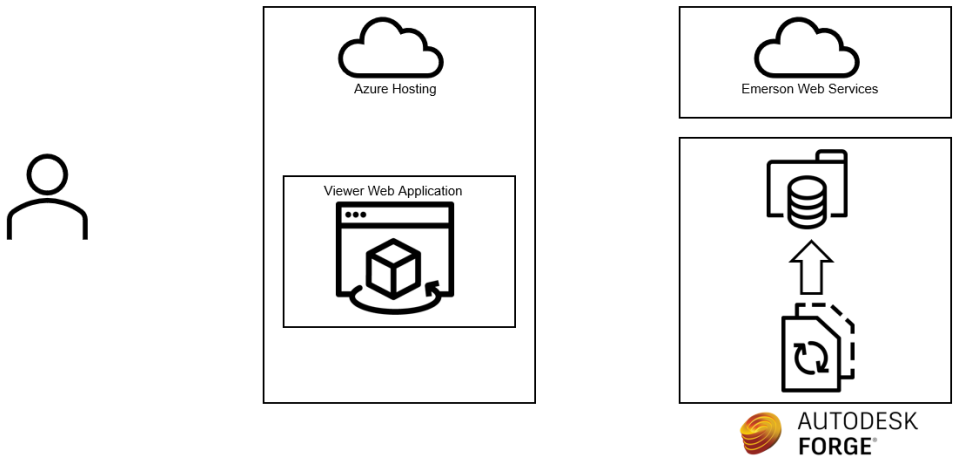




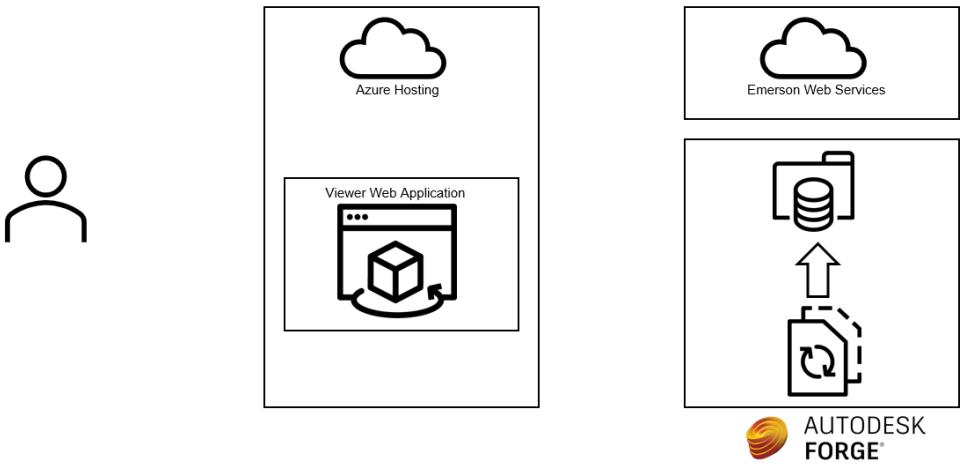
The source files are then converted for viewing via the model derivative services.



Once the conversion is completed the finished files are stored in the cache for future use.



The model derivate service notifies the system the assets are ready for use, and they are served up to the web application for viewing and download.



Continuing the Digital Thread

The concept of the digital thread is enabling a connected flow of data throughout the lifecycle of an asset from conception to retirement. As more and more people adopt processes and concepts that leverage data this concept is becoming more important to consumers of the data at different stages of design and usage.

Many stages of an asset's lifecycle will be isolated from each other. For example, when first being designed (or the birth of an asset) and the operation of an asset are separated not only by time but by who is interested in what data that is available about the asset. By providing as

much data as possible from the source at the beginning of the lifecycle, it saves time and reduces the potential for error as the asset moves from stage to stage. Providing an asset that can carry the metadata forward also allows different users to enhance or update information throughout the lifecycle. This concept can be carried over into a digital twin of an asset or a larger paradigm such as digital twin of the system the asset is being used in.