

IM227527

Mastering Collaboration in Design and Manufacturing with Desktop and Cloud

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Learning Objectives

- Understand the collaboration possibilities of Vault Professional
- Learn about the collaboration with Vault software's Project Sync capabilities
- Learn how to capitalize on Autodesk's desktop and cloud products
- Learn ways to effectively work with design data across multiple platforms

Description

Enterprise, medium-size, and small companies all have the same challenges: How to manage CAD data and how to collaborate on designs across multiple teams in an efficient way. This class will focus on an audience that's using Autodesk's design and manufacturing products like AutoCAD software, AutoCAD Mechanical software, Inventor software, and more. In the first part, we'll clearly explain how Vault software can help you to manage 2D and 3D CAD data and collaborate with others. Further, we'll smoothly integrate Vault software's Project Sync in our workflow as a facilitation to collaborate with externals. Once, we've passed our first connection to the cloud, we're going to demonstrate additional cloud-product use cases you can integrate to be more productive.

Speaker(s)

Andreas has a mechanical engineering background and started his career at an Autodesk® reseller in 2006. In the beginning, he developed and conducted standardized and customer specific Autodesk® Inventor® trainings. Over the years he became a CAD/PDM Consultant for Autodesk® software, especially for Autodesk® Inventor®, AutoCAD® Mechanical and Autodesk® Vault. He was responsible for the project management and realization of Autodesk® CAD/PDM software implementations at medium as well as large sized enterprises. In 2016 Andreas joined Autodesk Customer Success Organization and have been working as a Premium Support Specialist for Engineering Design and Data Management. He is assigned as a Designated Support Specialist to several Enterprise customers in Central Europe and serve as their primary technical contact from Autodesk. In his personal life, Andreas enjoys gym workouts, running and spend time with his wife and little daughter.

Customer Scenario

User Insights Survey

A leading global developer and supplier of technologies, automation and typical services for engineering and machinery with ~1.600 users of Autodesk Inventor, AutoCAD Mechanical and AutoCAD closely work on projects with internal and external parties. The IT department would like to know how users usually store and share their CAD data, beside other business-related questions. Autodesk suggested the User Insights Survey as benefit of their Enterprise Business Agreement.

A User Insights is a targeted and completely anonymous end-user survey developed to capture an “as-is” view of a customer’s environment, including infrastructure, product deployments, usage, and workflows. Based on the survey results, Autodesk analyses pain points and potential gaps affecting the customer’s productivity, and provides recommendations for services and solutions to optimize their use of Autodesk software.

Results

The overall number of survey respondents is **405 users**. Those users indicated statements on following questions.

- How often do you use Autodesk products?
→ **74 %** users are always using Autodesk products.
- How do you store data?
→ **46 %** users store their data on network shares.
- How do you share project data?
→ **40 %** users share their data via email.

Every IT department should be worried about these results. Where is 54 % of engineering data stored? Users partly indicated to store their data on local and external HDDs as well as on several cloud storage solutions. All these storage locations are outside of the company backup process and can’t be restored in a worst-case scenario.

Sharing engineering data via email is an inefficient way often results in time-consuming restructuring of referenced CAD data. Further, the customer limited the file size users can share. Therefore, the most users indicated to use external HDDs and non-Autodesk cloud sharing solutions. This also leads to the loss of file references, especially with DWGs XRefs and Inventor data.

Autodesk Vault

Vault data management software helps organize, manage, and track data creation, simulation, and documentation processes for design, engineering, and construction teams.

You can organize all your files and keep them in one location for easy access. All file versions are retained, so you never misplace or replace past versions. The vault stores each version of a file, along with all file dependencies, giving you a living history of the project as you work on it. The vault also stores file properties for rapid searching and retrieving.

In a design team, all the files and associated data are stored on the server so all users have access to the information and its history. Each member of a team must have a unique login name and password. Team members check out files to prevent more than one member from editing the same file at the same time. Once a file is checked back into the vault, team members can refresh their local copies of the model file to get the latest version from the vault, so all members of the design team work together.

Why Autodesk Vault?

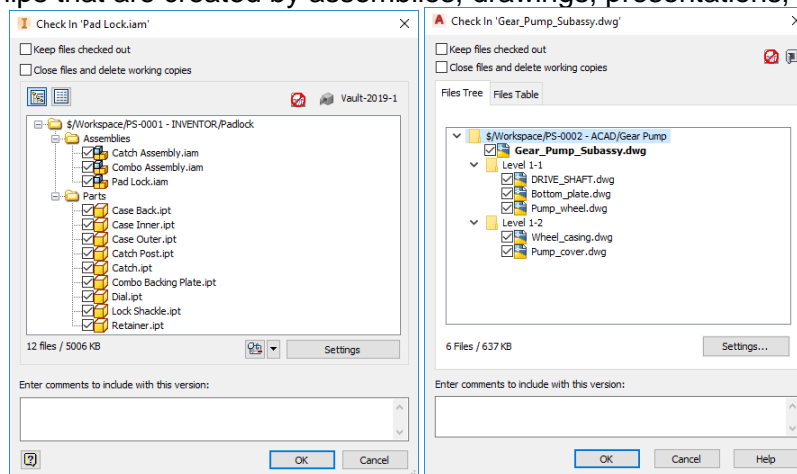
The User Insights Survey results have shown two major challenges. On the one hand the most engineering data is stored somewhere outside of a common storage location. On the other hand, this fact directly impacts data sharing methods as referenced datasets are mostly incomplete.

You've read in the Autodesk Vault definition Vault offers a common data storage solution and allows internal and external parties to access data. The functionality easily covers the called challenges. But, let us shed some light on additional collaboration benefits in Vault.

Direct CAD integration

Autodesk Vault offers integrated add-ins for more than 25 Autodesk applications those connect to the vault server to access files and perform vault operations.

Examples are the AutoCAD/AutoCAD Mechanical or the Inventor add-in. When data is added to a vault using the Inventor add-in, the add-in preserves all the complex relationships that are created by assemblies, drawings, presentations, and other files.

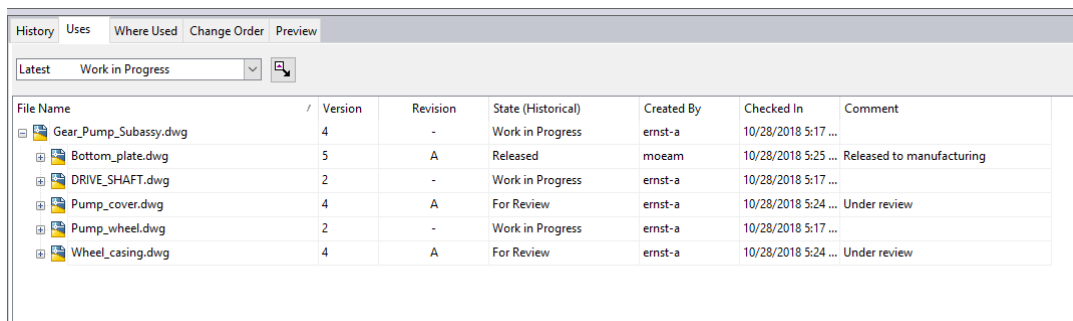


Inventor Vault Add-in and AutoCAD Mechanical Vault Add-in

Versions and Revisions

Are you still versioning or revising by creating copies of your datasets and store them in certain folders? I did it as well long time ago. Autodesk Vault takes over these tasks for you. Every time a file check in is done a new version is automatically created. You can easily go back and restore a dataset version from Vault.

Further, you can release complete datasets to approve a design. If such a dataset needs to be revised an automated revision mechanism is applied. So, you can track the lifecycle of all files within a dataset.

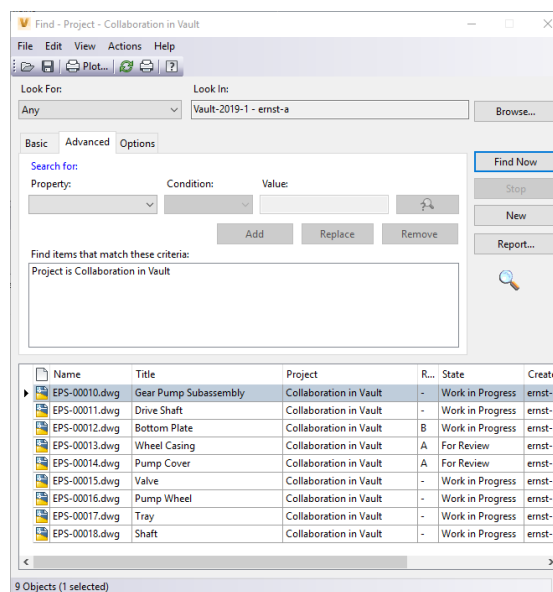


File Name	Version	Revision	State (Historical)	Created By	Checked In	Comment
Gear_Pump_Subassy.dwg	4	-	Work in Progress	ernst-a	10/28/2018 5:17 ...	
Bottom_plate.dwg	5	A	Released	moeam	10/28/2018 5:25 ...	Released to manufacturing
DRIVE_SHAFT.dwg	2	-	Work in Progress	ernst-a	10/28/2018 5:17 ...	
Pump_cover.dwg	4	A	For Review	ernst-a	10/28/2018 5:24 ...	Under review
Pump_wheel.dwg	2	-	Work in Progress	ernst-a	10/28/2018 5:17 ...	
Wheel_casing.dwg	4	A	For Review	ernst-a	10/28/2018 5:24 ...	Under review

Versions and Revisions applied on an AutoCAD Mechanical dataset

Metadata

Searching for design data is a seemingly simple task. But when you have thousands of files distributed across multiple project folders on the network, it's pretty frustrating and can take a lot of time to find exactly what you need. Vault indexes the information in all the files stored in the database—this includes custom properties and properties extracted from AutoCAD file attributes—so it's much faster to find what you need when you need it.



Find - Project - Collaboration in Vault

Look For: Any Look In: Vault-2019-1 - ernst-a

Basic Advanced Options

Search for: Property: Condition: Value: Add Replace Remove

Find items that match these criteria:
Project is Collaboration in Vault




Name	Title	Project	R...	State	Create
EPS-00010.dwg	Gear Pump Subassembly	Collaboration in Vault	-	Work in Progress	ernst-a
EPS-00011.dwg	Drive Shaft	Collaboration in Vault	-	Work in Progress	ernst-a
EPS-00012.dwg	Bottom Plate	Collaboration in Vault	B	Work in Progress	ernst-a
EPS-00013.dwg	Wheel Casing	Collaboration in Vault	A	For Review	ernst-a
EPS-00014.dwg	Pump Cover	Collaboration in Vault	A	For Review	ernst-a
EPS-00015.dwg	Valve	Collaboration in Vault	-	Work in Progress	ernst-a
EPS-00016.dwg	Pump Wheel	Collaboration in Vault	-	Work in Progress	ernst-a
EPS-00017.dwg	Tray	Collaboration in Vault	-	Work in Progress	ernst-a
EPS-00018.dwg	Shaft	Collaboration in Vault	-	Work in Progress	ernst-a

9 Objects (1 selected)

Search results within the Vault Search

Autodesk Vault Editions

The class exclusively focus on Autodesk Vault Professional as important collaboration functionalities (e.g. Multi-site replication, ERP integration, etc.) aren't available in Vault Basic and/or in Vault Workgroup. Following the most important items for collaboration with Vault. Reference [link](#).

Products	 Vault Basic	 Vault Workgroup Subscribe	 Vault Professional Subscribe
— Data management fundamentals			
Direct CAD integration	✓	✓	✓
Support for AnyCAD	✓	✓	✓
Fast data searching	✓	✓	✓
Central location for project data	✓	✓	✓
Data reuse	✓	✓	✓
Concurrent design	✓	✓	✓
Easy administration and configuration	✓	✓	✓
Quick, flexible deployment	✓	✓	✓
Microsoft Office integration (Word, Excel, PowerPoint)	✓	✓	✓
— Advanced data management			
Visual data management for Inventor		✓	✓
Automate tasks and deliverable creation		✓	✓
Automatically publish and manage PDFs		✓	✓
Projects and reporting		✓	✓
Revision control		✓	✓
Flexible data security		✓	✓
Microsoft Outlook integration		✓	✓
Project lifecycles		✓	✓
Vault Office ⓘ		✓	✓
BOM management			✓
Automated engineering change orders			✓
Custom objects			✓
Multisite scalability			✓
Revit integration			✓
ERP integration			✓

Most important features for Vault's collaboration

Autodesk Vault Architecture

Reference [link](#) from the Vault Help.

Collaboration setups

To give you an idea how Vault works and what you need for a setup I created small use cases from my experience. I tried to keep the use case very simple as this class is for Vault beginners or those of just need an overview about Vault's capabilities regards to collaborations.

Design Team Collaboration

Let's start with a really small design team consisting of 3 users. They use AutoCAD, AutoCAD Mechanical and Autodesk Inventor and work together on a design.

To get a start with Vault you need the following Vault components

- Vault server
As central data storage location for your design projects
- Autodesk Vault Client (Vault Explorer)
Needs to be installed on each seat to browse the complete Vault structure and perform file-based operation depending on your permission level.
- AutoCAD® Vault Add-in & Inventor® Vault Add-in
The add-ins come along with the Vault Client installation as far as the supported Autodesk application was installed beforehand.

Please, watch the video in the presentation to get an idea how you can add AutoCAD and Inventor data to the Vault.

Design Team Collaboration

For larger design teams mostly, a design or project manager is needed who is responsible for the approval of a design. Those personas don't necessarily need CAD applications and a full Vault Client. They can use

- Autodesk Vault Office Client
Needs to be installed on each design or project manager seat. No CAD applications are needed.

The Vault Office client is similar to the full Vault client, but provides only non-CAD file and folder data management options. This client is ideal for users who do not need all of the CAD functionality of a full Vault client, but who still need to manage documents in a vault.

Please, watch the video in the presentation to get an idea how the Vault Office Client can be used.

Collaboration across Departments

Let's integrate classic non-CAD users like shop floor, purchase and sales departments only need a read-only access. Every one of those personas have the Internet Explorer or other browsers support the Autodesk Design Review (ADR) plug-in.

- Autodesk Vault Thin Client
There is no client installation necessary as users access the Vault via supported browsers

The Vault Thin Client lets you browse the contents of a vault. If you have a Vault Office license, you can also perform file management tasks, such as adding files to a vault and checking files in and out of a vault.

Autodesk Vault Professional users can also review items and bills of materials (BOMs).

Please, watch the video in the presentation to get an idea how the Vault Office Client can be used.

Collaboration across Sites

The multiple site environment allows users to design products across multiple locations as if all the users were in one location.

- Autodesk Vault File Server (AVFS)
The AVFS is installed on a site server and only holds the File Store. A Windows SQL server isn't necessary as the AVFS directly communicates with the SQL instance of the main site (ADMS).
- Autodesk Vault server
Beside the main Vault server another Vault server is installed on a site. Each site owns its ADMS and SQL server.

You need to consider several factors when deciding if you want to set up a multiple site environment.

- Network reliability.
- Network latency and Bandwidth between sites. (Should be low latency and high bandwidth.)
- Number of remote sites.
- Number of users per site.
- Size and number of files to replicate per day/per hour.
- Estimated number of concurrent users.

Collaboration with Externals

Companies need to collaborate on CAD documents with external consultants, customers, and suppliers. The documents are often shared and collaborated on across a company firewall. It is essential that the right files are made available at the right time, and that they can be exchanged with ease regardless of their size or the number of documents.

Project Sync

Project Sync within Vault Professional 2019 provides file and folder synchronization between Vault and supported Autodesk cloud drive, Fusion Team.

- Autodesk Fusion Team
Fusion Team provides a central workspace in the cloud (hub) for your projects. You only need to subscribe.

Using AVFS or ADMS

A quite straight forward solution is to implement an AVFS or ADMS on external site. The functionality is identical to (internal) setups.

Using VPN

Another approach to let work externals on your designs is to use a Virtual Private Network (VPN) connection. You can either connect to the ADMS or AVFS.

- Autodesk Vault Client (Vault Explorer)
- AutoCAD® Vault Add-in & Inventor® Vault Add-in
- Autodesk Vault Office Client
- Autodesk Vault Thin Client

You should consider that VPN connections are known for low performance. Please, ask you IT department to get an improved VPN.

TBD

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