Windows Explorer wasn't made for engineers

How much time do you waste managing your design data?

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Introduction

Engineers spend, on average, 15 percent of their time managing data—and some routinely waste the equivalent of one day a week or more.*

Much of this waste is due to the simple fact that Windows® Explorer wasn't made for engineers. And it certainly wasn't made to manage CAD files. To illustrate, here are a few examples of data management challenges you and your engineers probably deal with daily:

When sifting through thousands of files, you wish you could search for more than just a file name.

You dread copying or renaming files. It's tedious and you typically need to repair broken references.

When you work with other engineers on a project, you worry constantly that they will overwrite your files.

You manually maintain spreadsheets that document every instance where parts and subassemblies are used.

To overcome these challenges, you need a file manager that's made just for engineers. It should understand the complexities of CAD file relationships, help you find the files you need when you need them, and, most important, make it easy for you to collaborate with your colleagues.

Product Data Management (PDM) exists just for this purpose. This guide outlines the different ways Windows Explorer can undermine engineers' productivity, and illustrates how a solid PDM strategy can help your entire team spend more time doing what they do best.

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What is PDM?

Think of PDM as a business strategy for managing your product-related information and engineering processes in a single spot.

It serves several purposes, including:

Protecting your intellectual property

Improving engineering productivity

Acting as a repository for engineering knowledge

Providing an audit trail of the entire development process

This guide focuses primarily on how a PDM strategy can help you better manage your design files. But it's important to understand that PDM is about much more than CAD file management. Once you have all your data in one location, there are many things you can do with it to improve everyday engineering processes like design reuse, engineering change orders (ECOs), product releases, bills of materials (BOMs), and product customization.

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Finding what you need, when you need it

When engineers are asked about their data management challenges, they typically identify search and retrieval of design files as top issues.

In fact, 46 percent of those involved in product development cite "finding the right information" as a top design challenge.**

Finding a file should be a simple task. But too often, the data you're looking for is spread across local drives on individual workstations and shared folders on assorted servers. There's also the problem of volume: With multiple people contributing to hundreds of projects, thousands of files can accumulate over time. And the only criteria you can consistently search for is the file name.

This all adds up to a lot of wasted time. When you can't find the files you need, you may end up wasting even more time designing something that may already exist, which is compounded by the need for additional investments in tooling or redevelopment of manufacturing processes that were already available for the design you couldn't find.

These situations make clear why Windows Explorer is simply not up to the task.
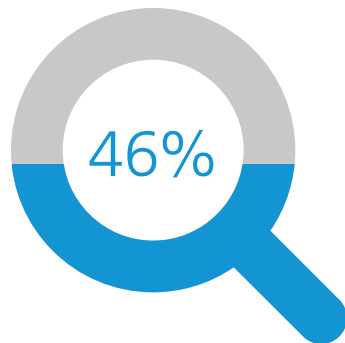
46%

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How PDM makes finding data simple

With a PDM strategy in place, you can use the search criteria that makes sense to you as an engineer.

If you want to find an aluminum 150 mm gear created by one of your colleagues on a project two years ago, you don't have to remember the file name. Just use that exact specification in the search to find exactly what you need quickly.

The first step in a PDM strategy is to put all your files in a single spot. You can still use folders to organize data at a top level or within your projects, so you have the option to browse or search within a narrower set of data. Once all your data is in one location, you can:

Search for more than just file names

PDM systems are designed to fundamentally understand CAD files, so all file-related properties are indexed and searchable. This includes default properties that are cataloged automatically or custom properties that you can map to parameters or characteristics unique to your designs.

Use multiple search criteria

It's likely many of your designs have many similarities, so when trying to identify the few relevant items you're looking for, you may need to conduct a detailed search. Having the option to use several different properties and Boolean operations to filter down results is extremely useful to find just what you need.

Save your common searches

You probably need to conduct the same types of searches over and over again. Saving your searches gives you one-click access to common things like documents you are working on or important files in the project.

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Reusing designs

The endless search for files isn't the only way inefficient data management can sap your productivity.

Tedious and repetitive design office tasks are also near the top of the list. For example, 29 percent of engineers report that reuse of data is a top design challenge.**

The complexity of CAD files is a root cause for this issue. Instead of housing everything in a single file, links are built between parts, subassemblies, and top-level assembly files. Playing around with those files in Windows Explorer can cause things to break quickly. To reuse designs, you will eventually need to find a way to copy the data and give it a new name. Just try moving, renaming, or opening a copied file, and odds are all of those references will be severed. That means you'll need to spend time pairing everything back up inside your CAD software.

There are better ways of copying designs built inside most CAD applications, but the task remains tedious and repetitive. For example, if you have an assembly with hundreds or thousands of parts, it is extremely inefficient to manually select each file you want to copy, rename each copied file, specify the destination location for each new file, and confirm everything worked properly.

Since design reuse is such a common activity, another significant data management challenge is determining the total impact of a design change to a part or subassembly that is used in multiple products. Windows Explorer can't tell you that. More than likely, you manually maintain a few spreadsheets that list all the files used in top-level assemblies and subassemblies. This approach does work, but keeping those spreadsheets up to date can be time consuming.

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Move, copy, and rename with PDM

Reusing existing designs saves development time as well as manufacturing and tooling costs, but the process should not undermine your productivity.

A PDM strategy removes the repetitive tasks and frustration involved with the technical aspects of reusing existing data, giving you more time to work on what's actually new in the design. Here's how:

Drag and drop

PDM systems are generally designed to provide similar usability to Windows Explorer with the added benefit of not breaking things when you make changes. So, you can drag and drop a file or folder within the system just as you would do normally, without worrying what will happen the next time you open it or another file where it is used.

Rename anything

With PDM, you can rename files exactly as you would inside Windows Explorer; the difference is that PDM software makes sure all links remain intact. You can also use tools to apply naming schemes to entire batches of files. This is especially useful when copying a design or working on a project that involves hundreds or thousands of files.

Copy design

One of the most powerful tools a PDM solution can provide is the ability to simplify design reuse into a single step. Once the top-level assembly is selected, every file referenced in the assembly is identified and included in the copy operation. From there, you can pick and choose which files you want to copy, reuse, or remove from the new project, and then define a scheme for renaming the copied files.

See where parts or subassemblies are used

Since relationships between files are already being tracked, in a single click you can see everywhere a part or subassembly is used. PDM works in the opposite direction as well, allowing you to see every file used by a part or assembly.

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Working well with others

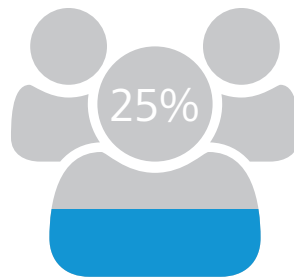Collaboration is an essential part of the development process.

But more than 25 percent of engineers said that collaborating with internal colleagues and working with conflicting document versions are significant problems.[*]

Windows Explorer lacks some basic capabilities that engineers need to make collaboration on a project easier. For example, there is no simple way to prevent other people working on the project from accidently overwriting your files in a shared folder. To prevent this from happening, you need to be able to lock down files while you're editing them.

Your team also must be disciplined about properly maintaining versions of designs. However, tasks that rely solely on discipline are likely to fail eventually due to human error.

Storing files on shared network folders creates additional collaboration issues, particularly with larger teams. A few dozen engineers opening files directly from shared folders and saving often (as they should) can strain network capacity. Pulling the files down to the local computer while editing reduces the traffic, but creates more opportunities for data loss. It also makes it more difficult to find files, since they can be anywhere at any time. And with different versions of the same part or assembly in many different places, it is hard for your team to answer the question: "Which one is the most up to date?"

25%

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More effective collaboration with PDM

Helping engineers work better together is a fundamental pillar of PDM.

A PDM strategy helps to remove the typical problems that can arise when multiple people are working on the same set of files. You get the benefit of collaboration without the loss in individual productivity.

Here are some specific ways PDM helps engineers to collaborate more effectively:
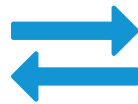
Checking out, checking in

PDM solutions remove all concerns about overwritten files with a simple yet fundamental capability: check out and check in. Just like your local library, when you check out a file, nobody else can touch it until you check it back in (it becomes "read-only"). While it's checked out, everyone can still find the file and see who is actively working on it, so you know exactly which user to track down.

Versioning

Versioning capabilities keep track of all the changes you make during the design of the product while maintaining the same file name. It logs the who, what, and when behind each change, providing traceability and context for each update to the design. You always know which version is the latest. When paired with check-out/check-in capabilities, versioning prevents conflicts from developing when multiple engineers are contributing to the same files in the project.

Working locally, saving globally

Most PDM systems operate under the principle that data is best stored in a place with global access, but edits should be made locally. When you check out a file, it is faster and less draining on the network to download the file once to your local workstation, save locally as you edit the design, and then upload it back to the server as a new version when your changes are complete. This process helps to protect against data loss because the original file still resides on the server. It also ensures all files remain searchable and discoverable even when checked out.

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Conclusion

Can a PDM strategy really make a difference?

Consider the facts: World-class manufacturers are 30 percent more likely to use PDM or product lifecycle management (PLM) to manage their design data; these top performers also spend 25 percent less time on non-productive data management tasks.[**] PDM is likely to have a positive impact on your efficiency and productivity, too.
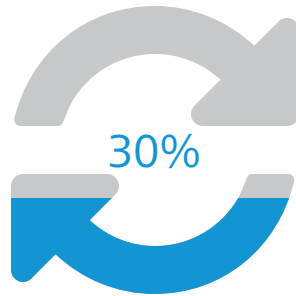
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Get a better handle on PDM

Learn how Autodesk can help you better manage your design data

The Autodesk® Vault family of products is a comprehensive PDM solution that allows you to better manage your design data and track your development processes throughout the Digital Prototyping pipeline.

In addition, Autodesk and our value added resellers are experts in helping customers better manage their design data. We work with thousands of companies across the world, sharing sound advice on potential opportunities for improvement and crafting solutions to real customer problems.

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