



The benefits of using AutoCAD® 2024 vs. AutoCAD® 2019



A productivity study detailing the differences between AutoCAD® 2024 and AutoCAD® 2019.

AutoCAD 2019 was a popular version with its release. But there have been significant, new features and commands in subsequent versions, allowing you to work smarter and not harder. This study details the productivity gains a user may experience when using AutoCAD 2024 versus AutoCAD 2019, highlighting the latest features and commands designed to streamline your work and take full advantage of your subscription.*

Executive summary

Designed by Autodesk and commissioned by an independent consultant, this study explores common tasks required when preparing designs and documents in AutoCAD 2019 and the subsequent productivity gains using AutoCAD 2024. A set of designs and documents will be showcased using AutoCAD 2019 and AutoCAD 2024—with tasks ranging from counting blocks in a DWG file to comparing DWG files with DWG Compare and saving to the AutoCAD Web & Mobile folders to work with your designs in the cloud.

AutoCAD 2024 provided an **average productivity gain of up to 58%** for key collaboration tasks (depending on user expertise level with AutoCAD and based on experience and training).**

In addition to the tasks completed for this study, an overview of additional productivity features introduced in AutoCAD 2024 are outlined in this report's conclusion—including enhancements to the user interface and the new Activity Insights feature.

NOTE (*): As of March 2023, the earliest AutoCAD version available through your Autodesk Account is AutoCAD 2021. By upgrading to AutoCAD 2024 through your existing AutoCAD subscription, you can take full advantage of the latest features and commands.

**As with all performance tests, results may vary based on machine, operating system, filters, and even source material. While every effort has been made to make the tests as fair and objective as possible, your results may differ. Product information and specifications are subject to change without notice. Autodesk provides this information "as is", without warranty of any kind, either express or implied.

Key findings

AutoCAD 2024 was shown to outperform AutoCAD 2019 in all six tasks completed for this study:



Collaborating on design changes was **64%** faster



Importing markups into drawing files was **58%** faster



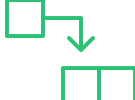
Counting blocks was **70%** faster



Comparing external reference files (XREFs) was **52%** faster



Reusing design content with blocks was **47%** faster



Placement and replacement of blocks was **67%** faster.



The study

This study explores six common design challenges when working in a typical 2D floor plan and directly compares the time and effort required to accomplish each specific task in AutoCAD 2024 versus AutoCAD 2019.*

The same tasks were completed up to **58%** faster using AutoCAD 2024.

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The performance results in this paper were achieved by one user with expert-level experience, using both AutoCAD 2024 and AutoCAD 2019 and conducting comparative tests on the same AutoCAD sample project. The tasks are comprehensive in nature. The total time it took to complete each task using AutoCAD 2024 and AutoCAD 2019 is documented in each case.

A detailed description of the study follows.

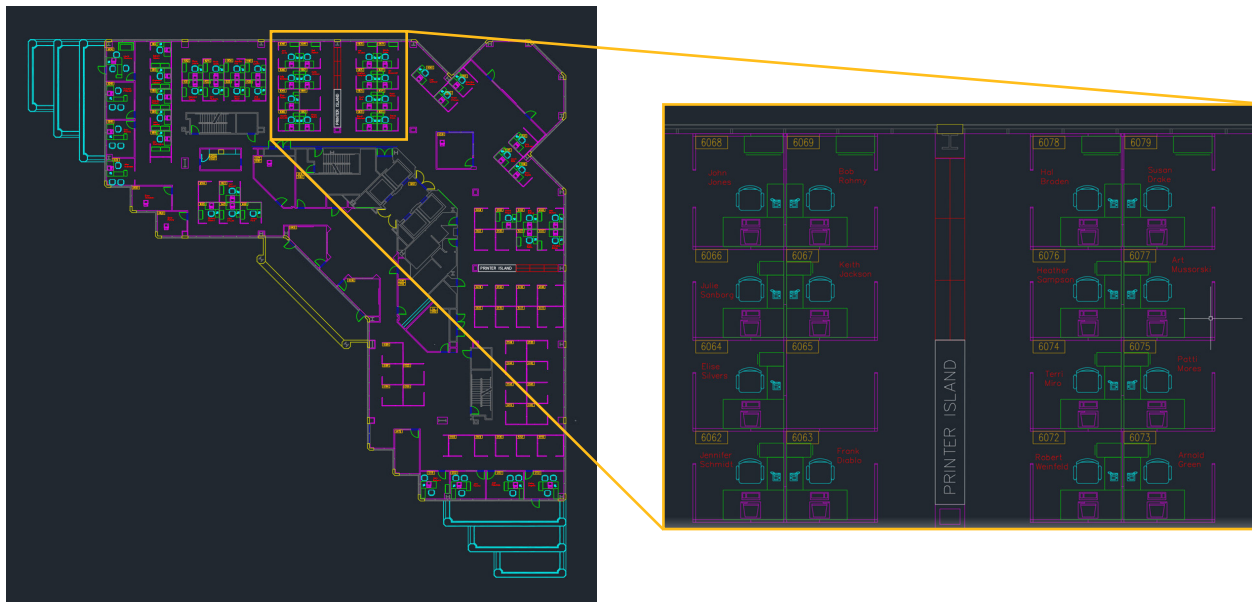


Fig.1 – A typical 2D floor plan

NOTE (*): It was assumed during the study that any symbols and title blocks needed in AutoCAD for the design process were local to the document. Search time is subjective, and this method allows for the quick placement of required blocks in the shortest possible time.

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Design task 1

Collaborating on design changes in a DWG file

Changes in a DWG file need to be shared clearly and effectively. This is to ensure that design intent is understood and implemented accurately. AutoCAD has always provided accurate drafting tools, but the need to make changes to a design often causes a roadblock to productivity.

AutoCAD 2024 gives you access to AutoCAD Web & Mobile folders after installing a small AutoCAD plugin. This encourages using the AutoCAD on the web and mobile to share and collaborate on DWG files via the cloud. You can also use Autodesk Docs, Autodesk Drive, or other cloud storage providers, such as Box, Dropbox, Google Drive, Microsoft OneDrive, and your local files. All the markup information is added using the Trace functionality in AutoCAD 2024, which is also available through the AutoCAD on the web and mobile.

In AutoCAD 2019, the optimal way to collaborate was through the use of the DWF file format. A drawing would be exported as a DWF file (like a PDF file), and the recipient could use Autodesk Design Review with no need for an installation of AutoCAD to view, check, and redline markup the DWF file. This was seen as effective back when AutoCAD 2019 was released. However, it required the recipient to have a license of Autodesk Design Review and relied on them receiving and sending back the appropriate DWF file.

Task

This task compares the time taken using a DWG file from AutoCAD 2024 as compared to the output and review of a DWF file from AutoCAD 2019.

The task looks at the Trace functionality in AutoCAD 2024 in conjunction with the AutoCAD on the web as compared to the marking up an exported DWF file in Autodesk Design Review, which is then sent back to the AutoCAD originator and viewed in the Markup Set Manager in AutoCAD 2019.

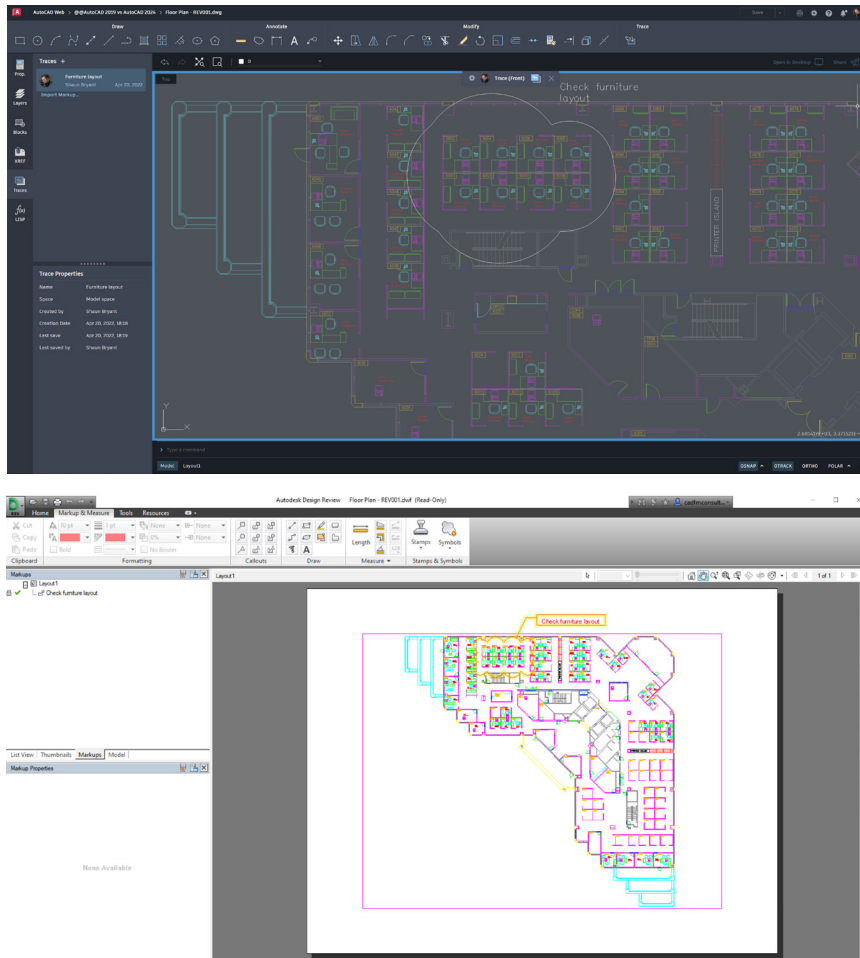


Fig.2 – An imported markup trace layer using a DWG file in AutoCAD 2024 (top) vs using Autodesk Design Review to review a DWF file output from AutoCAD 2019 (bottom)

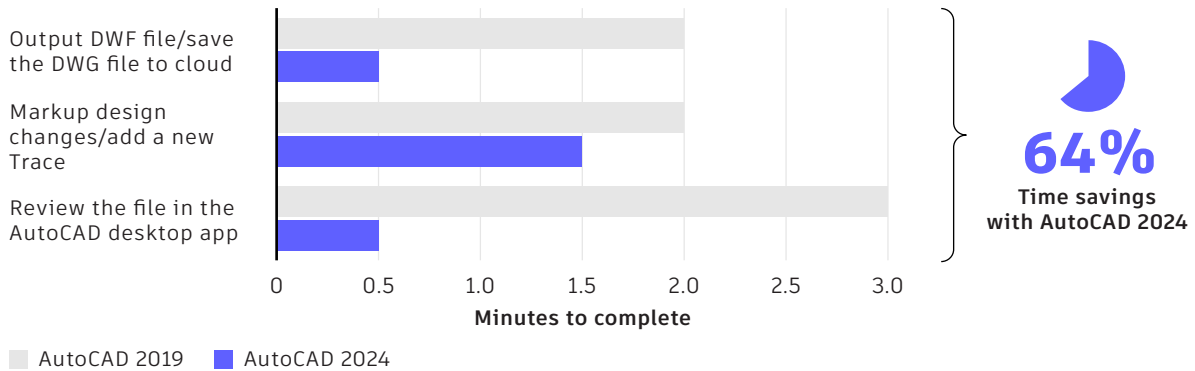
Steps (AutoCAD 2024):

- Save the DWG file to a cloud-based location (such as the AutoCAD Web & Mobile folders)
- Add a new Trace to the saved DWG file in the AutoCAD on the web
- Review the Trace in the same DWG file using the AutoCAD desktop app and save the new file revision

Steps (AutoCAD 2019):

- Output the DWG file to a DWF file
- Open the DWF file in Autodesk Design Review to markup and communicate design changes
- Review the marked-up file in the Markup Set Manager and save the new file revision

Collaborating design changes in a DWG file



Results

Utilizing the AutoCAD Web & Mobile folders (or a preferred cloud storage provider) combined with the AutoCAD on the web and mobile through your AutoCAD 2024 subscription is a great time-saver, allowing for more productivity when collaborating and sharing your designs. It also means that you and your team can work concurrently on the same DWG file, updating changes on the fly.

Using the DWF output method in AutoCAD 2019 is a lengthier process that introduces another file format (DWF) that needs to be tracked and maintained in addition to a DWG. That file must be opened in another application, Autodesk Design Review, leaving the workflow open to error if the wrong DWF file is used.

Access to AutoCAD on the web and mobile are part of your AutoCAD 2024 and AutoCAD LT 2024 subscription. This access along with your desktop app provides a much leaner workflow that saves a large amount of time in the collaboration stages of a project.

Design task 2

Importing markups into drawing files

AutoCAD has long had the ability to import raster images and PDFs using commands such as PDFIMPORT and ATTACH. This required time to assess and scale the raster images and copy the text annotation across. It was often easier to manually type out annotations directly into AutoCAD, copying it from the raster image instead of using raster to CAD applications.

In AutoCAD 2024, the Markup Import and Markup Assist features utilize machine learning to take text annotation from a raster image and bring it directly into the DWG file as AutoCAD text.

In AutoCAD 2019, a raster image was attached or imported, and valuable project time was wasted making sure the appropriate annotation was in the DWG file and presented accurately. Certain Express Tools could be used, but these also took up valuable time.

Task

This task compares the different import workflows used in the 2024 and 2019 versions of AutoCAD, where markups are required in a DWG file.

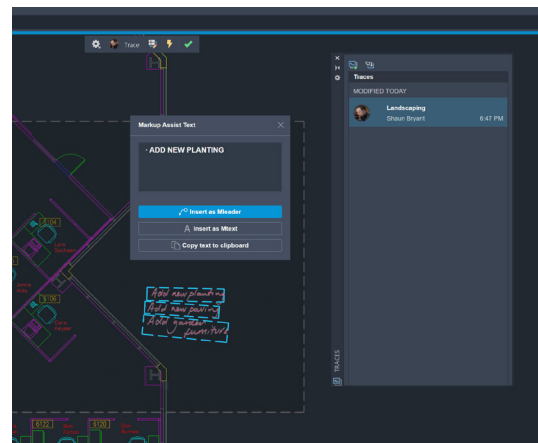
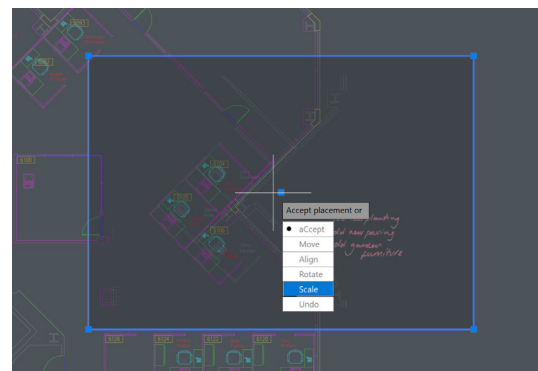
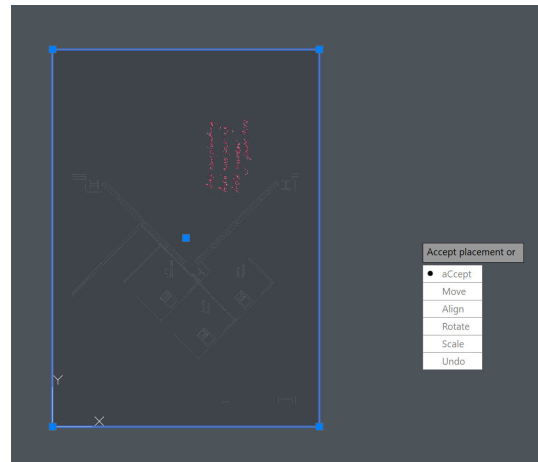


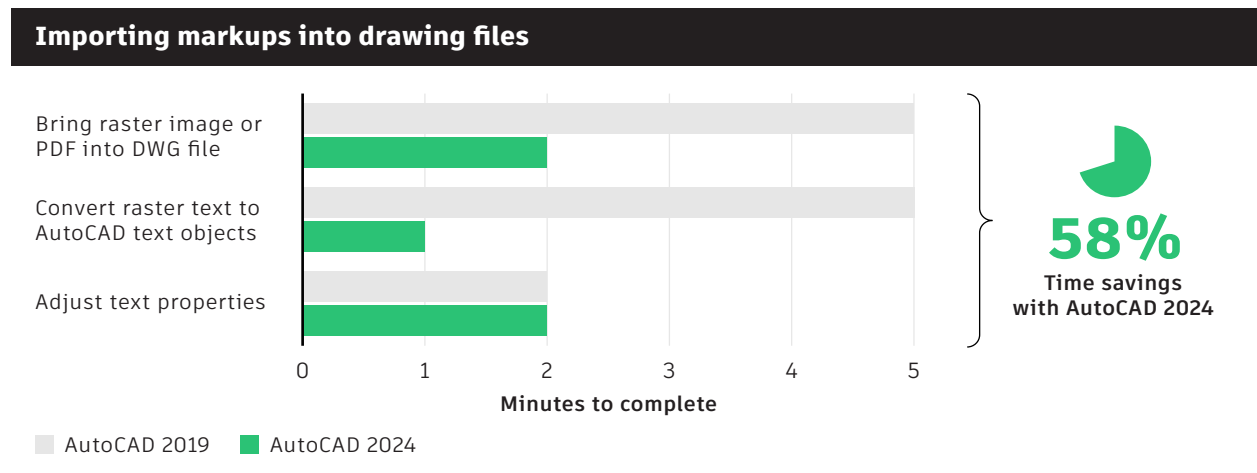
Fig.3 – Working with Markup Import and Markup Assist in AutoCAD 2024

Steps (AutoCAD 2024):

- Use Markup Import to import a markup file, such as a PDF
- Use the Markup Import tools to place and scale the markup
- Use Markup Assist to convert raster text to AutoCAD text objects

Steps (AutoCAD 2019):

- Bring raster image/PDF into the current DWG file
- Create AutoCAD text objects from what is in the raster image/PDF, copying what is there already
- Adjust text properties, such as layer and text style



Results

In AutoCAD 2024, the Markup Import and Markup Assist features allow for a quick and easy method to import a raster image markup, such as a scanned PDF, and rotate and scale the imported markup to suit the host DWG file. Markup Assist lets you quickly convert raster text annotation to AutoCAD text annotation using machine learning. This provides a visual, effective workflow that lists the markups in the Traces palette, utilizing the Trace feature in newer versions of AutoCAD.

In AutoCAD 2019 and previous versions of AutoCAD, there would be a requirement to replicate what is in the raster image/PDF, thus creating repetitive work and being less productive. There would also be the opportunity for errors to be transferred to the DWG file.

Design task 3

Counting blocks in a DWG file

Facilities management documents often start with a set of office floor plans used to assess the maximum capacity of each floor in the building. The number of desks, chairs, computers, and other office-related items would be reflected in the plans—and need to be manually counted.

A typical scenario would be an office move requiring an office furniture inventory. This would include all workstations, computers, chairs, office plants, and more. In this task, all those objects are represented by AutoCAD blocks which need to be counted for an accurate count of all office furniture.

Task

This task compares the time taken to count a group of blocks using the DATAEXTRACTION command in AutoCAD 2019 and put the relevant block count into an AutoCAD table, compared to the time taken to use the COUNT command in AutoCAD 2024 and generate a table of the associated block count.

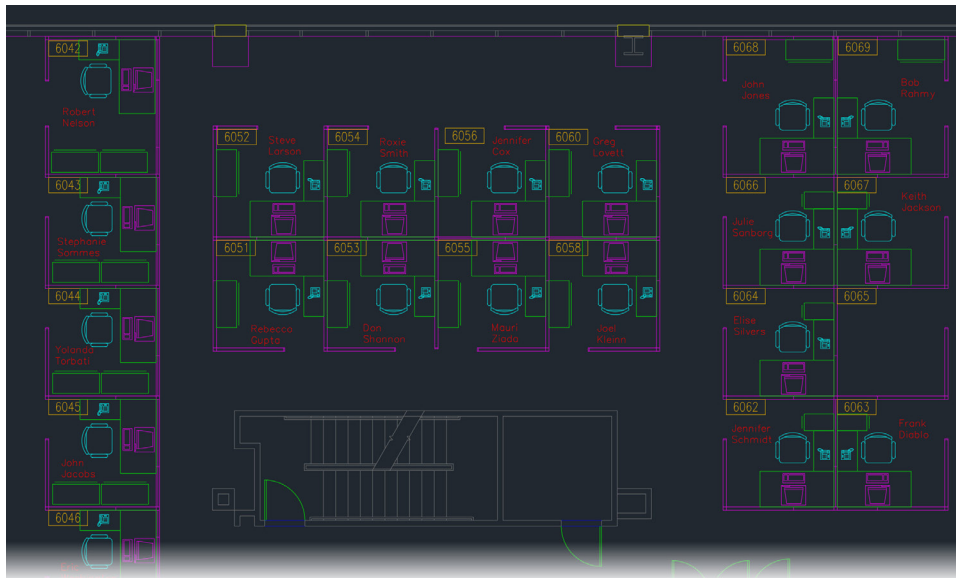


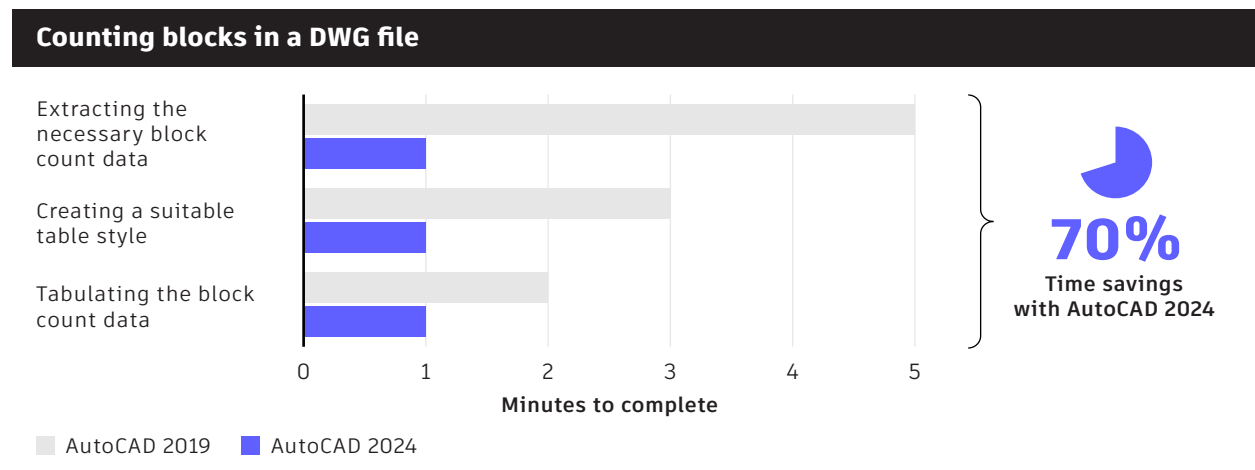
Fig.4 – A typical 2D office floor plan where a block count might be required

Steps (AutoCAD 2024):

- Extract the necessary block count data using COUNT command
- Add an AutoCAD table to tabulate the block count data

Steps (AutoCAD 2019):

- Extract the necessary block count data using DATAEXTRACTION command
- Add an AutoCAD table to tabulate the block count data



Results

Before the counting process started with AutoCAD 2019, you either had to be armed with a set of highlighter pens and hardcopy drawings or be incredibly familiar with the DATAEXTRACTION command. You had to perform either a manual hardcopy count where each instance of a particular block was marked with a separate highlighter color or run a full data extraction. Both processes could be a massive drain on time when working on a project.

The COUNT command in AutoCAD 2024 is a great time-saver, allowing more productivity when counting blocks in your designs. You can still use the DATAEXTRACTION command in AutoCAD 2024, and it requires more input in numerous dialog boxes to ensure you get the relevant block count data into an AutoCAD table.

The COUNT command is much more specific and will count all the blocks in your DWG file. In AutoCAD 2024, you can specify an area of a drawing to count blocks, display any exploded blocks, and also count nested blocks within a block.

Design task 4

Comparing external reference files (XREFs)

External reference files (XREFs) in AutoCAD are an effective method of using other DWG files to display and highlight design information. XREFs also allow for concurrent work, where other AutoCAD users can work on the XREF files which will then be updated to show the most current information in the host drawing.

First introduced in AutoCAD 2021, AutoCAD 2024 includes the XREF Compare feature with the XREFCOMPARE command. This allows users to check iterations of the same XREF file to ensure that the appropriate XREF is being used and that it contains the correct design information.

In AutoCAD 2019, there is no way of checking or comparing XREFs that are attached to the host DWG file automatically. The only way to do this would be to open each individual XREF and check the design content. Not only is this time-consuming, but it can also leave the XREF workflow open to error if the wrong XREF is used.

Task

This task demonstrates how the XREF Compare command (XREFCOMPARE) in AutoCAD 2024 provides a tool to compare attached XREFs against AutoCAD 2019, which has no tools to perform this function.

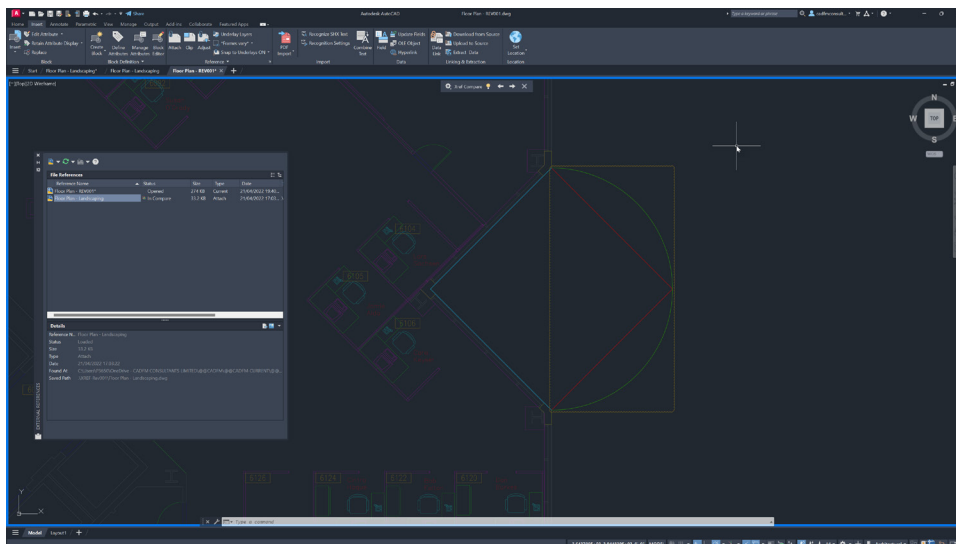


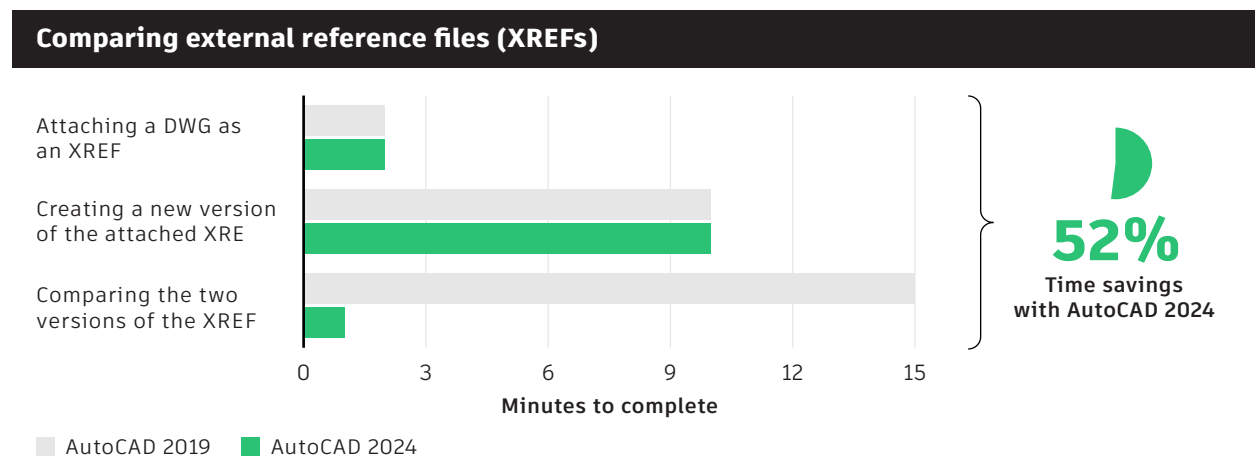
Fig.5 – The XREF Compare tool being used in AutoCAD 2024

Steps (AutoCAD 2024):

- Attach a DWG as an external reference file (XREF)
- A new version of the attached XREF file is created
- An automated comparison of the two XREFs is made for changes/errors with both XREFs open in the XREF Compare tool

Steps (AutoCAD 2019):

- Attach a DWG as an external reference file (XREF)
- A new version of the attached XREF file is created
- A manual comparison of the two XREFs is made for changes/errors with both XREFs open in AutoCAD



Results

XREFs in AutoCAD have been around for many years, providing a great way of adding design content to a DWG file without making it too data heavy. They also allow for concurrent working where other AutoCAD users can work on the XREFs independently, and then update them to show the latest drawing information in the host DWG file.

In AutoCAD 2024, the XREF Compare feature provides a quick and efficient way to check one XREF against another, highlighting the difference between the two compared XREFs. The user can also navigate and zoom to each compared difference between the XREFs.

In AutoCAD 2019, XREFs needed to be checked and compared manually where the XREF drawings were opened and looked over for changes and/or errors.

Design task 5

Re-using design content with blocks

Blocks have been in AutoCAD for many years and are an extremely effective method of reusing design content. In an office floor plan, typical blocks are items such as desks, chairs, and external items such as doors and windows. These items are used repetitively and making them into blocks saves time and does not involve a redraw or repeated use of the Move and Copy commands.

AutoCAD 2024 gives you access to the Blocks palette using the BLOCKSPALETTE command. The Blocks palette was originally introduced in AutoCAD 2020 but has been enhanced in each subsequent release. The palette interface gives you a visual reference of all the blocks in your current drawing.

In AutoCAD 2019, it was standard procedure to have a separate block DWG file that was often open at the same time as the current project drawing, and blocks were either dragged and dropped from one drawing to another or copied and pasted. This did not allow easy management of the blocks being used, nor could any specific block settings be applied, such as scaling or rotation. The only way this could be done was to use the INSERT command, which brought up a dialog that allowed you to insert one block at a time with specific settings.

Task

A new block needs to be created in the drawing. This will then be saved to a known location, such as a hard drive, the cloud, etc. The block will then be relocated and inserted into the current DWG file. Two workflows to perform this task will be considered, one in AutoCAD 2024 and one in AutoCAD 2019.

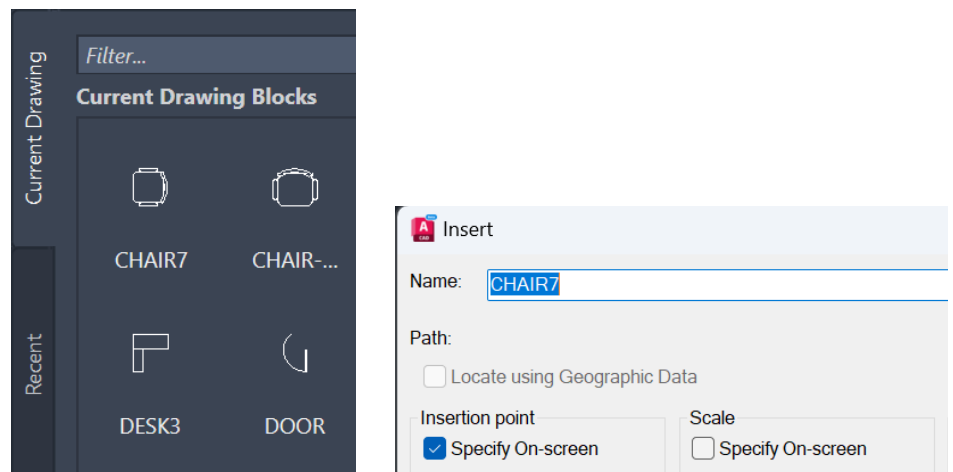


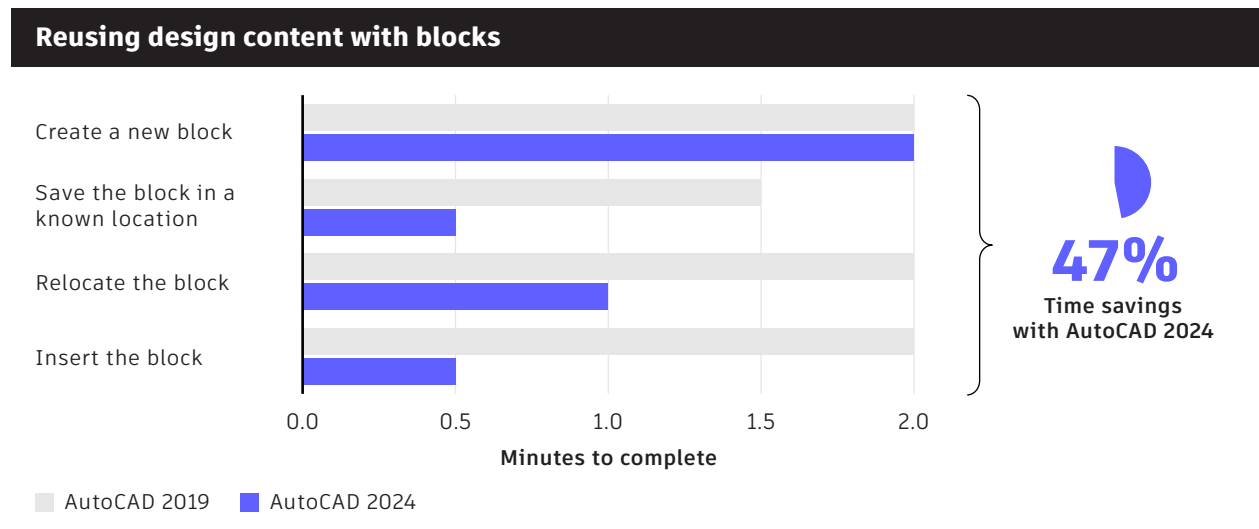
Fig.6 – The Blocks palette in AutoCAD 2024 on the left and the classic Insert dialog box in AutoCAD 2019 on the right

Steps (AutoCAD 2024):

- Create an AutoCAD block
- Save the block in a known DWG location
- Re-locate the block from the Recent tab in the Blocks palette
- Insert the block from the Libraries tab in the Blocks palette

Steps (AutoCAD 2019):

- Create an AutoCAD block
- Save the block in a known DWG location
- Re-locate the block
- Insert the block into the current drawing using the classic Insert dialog



Results

The Blocks palette in AutoCAD 2024 is a great way to save time when reusing blocks in your DWG files. It provides a clear, visual method of inserting blocks into drawings using the palette interface you are used to in AutoCAD. It also provides tabs to blocks in the current drawing (Current Drawing tab), a tab for blocks you have recently used in ANY drawing (Recent tab), a tab for your most used favorite blocks (Favorites tab), and a facility to link to any existing block libraries and drawings that contain blocks (Libraries tab). The Libraries tab can also be linked to cloud-stored/synced library locations for easy accessibility to blocks used within an organization or on a project.

In AutoCAD 2019, you could only use the INSERT command and the dialog box to insert blocks individually, whereas the Blocks palette in AutoCAD 2024 covers all bases and saves time, making you more productive by shortening your blocks workflow.

The CLASSICINSERT command in AutoCAD 2024 will still allow you to use the classic Insert dialog box, inserting blocks from the DWG file, Web & Mobile folders, and cloud-based storage.

The Blocks palette will allow you to insert blocks and work with blocks from recently used drawings and blocks saved to the Web & Mobile folders, as well as cloud-based storage. It also provides a Favorites tab where regularly used blocks can be found to be used over multiple projects. The Blocks palette can also be anchored and/or docked, allowing blocks to be immediately on hand within the AutoCAD interface.



Design task 6

Block placement and replacement

In AutoCAD 2019, blocks are placed in the traditional way, using the Insert dialog box. Not only does AutoCAD 2024 allow block placement via the Blocks palette as reviewed in the previous section, it also introduces the use of Smart Blocks: Placement and Smart Blocks: Replacement. These features allow for the automatic placement of blocks using previous placements and the ability to quickly find and replace existing blocks—saving on manual drafting time needed to place and replace blocks in AutoCAD 2019.

Task

A new block needs to be placed in a drawing. The task will compare a common block placement method using AutoCAD 2024 and AutoCAD 2019. This will require locating the block to be used along with the drafting techniques required to place the block. The block will then be replaced with an alternative block, using both AutoCAD 2024 and AutoCAD 2019. This will involve locating the replacement block and the subsequent method used to replace the existing block.

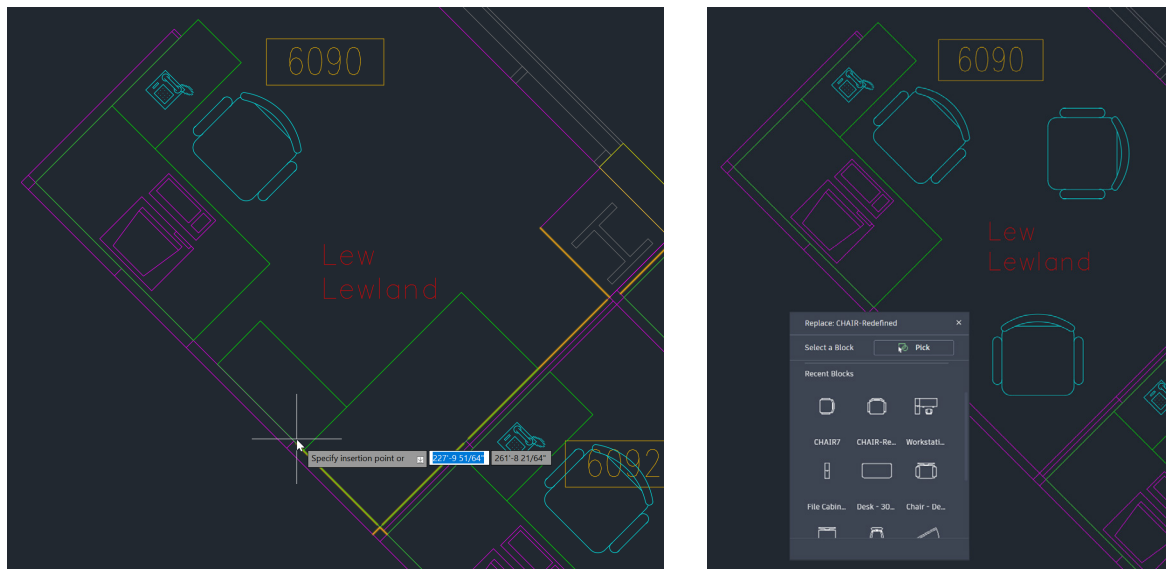


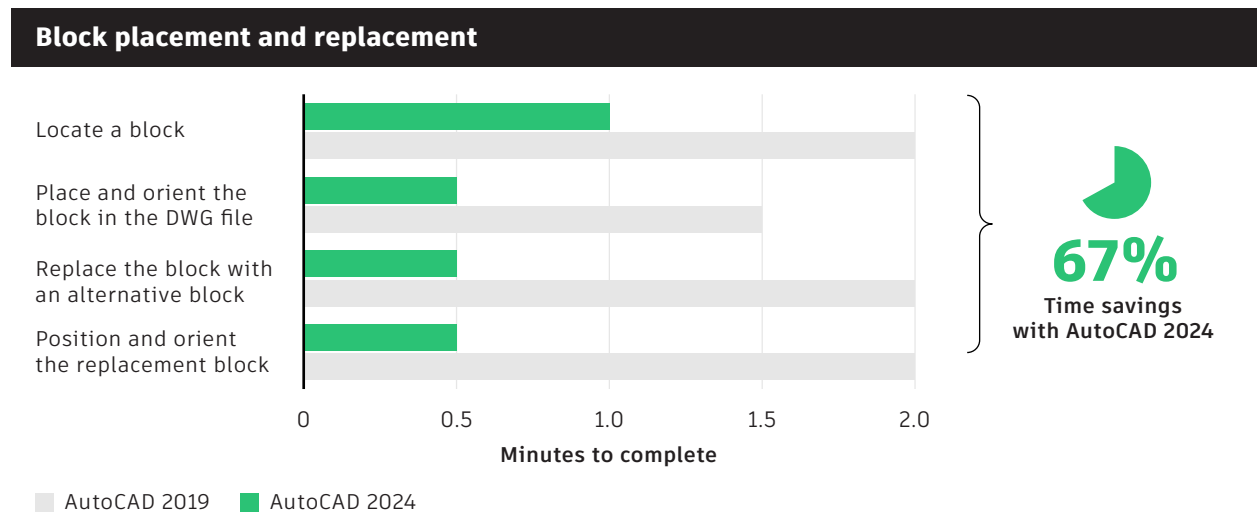
Fig.7 – Block placement and block replacement

Steps (AutoCAD 2024):

- Locate an AutoCAD block
- Place the block in the DWG file using Smart Blocks: Placement
- Replace the block with an alternative block using Smart Blocks: Replacement
- Ensure correct block positioning using MOVE and/or ROTATE commands.

Steps (AutoCAD 2019):

- Locate an AutoCAD block
- Place the block in the DWG file using object snaps for location and orientation
- Replace the block with an alternative block
- Locate and orient the replacement block using object snaps and the MOVE and/or ROTATE commands



Results

The Smart Blocks: Placement feature in AutoCAD 2024 is a great way to save time when placing blocks in your DWG files. It suggests locations and orientations from previous block placements from the Blocks palette, providing substantial time savings over traditional block placement methods in AutoCAD 2019, where blocks would need to be placed and modified manually.

The Smart Blocks: Replacement feature in AutoCAD 2024 provides a simple block replacement interface, suggesting already-used blocks. Once the replacement block is selected, the Smart Blocks: Placement feature can be utilized for quick block placement and orientation. In AutoCAD 2019, a typical block replacement workflow would require the name of the block, the manual location of the block, and its associated manual orientation. The replacement and placement features in AutoCAD 2024 automate this workflow, thus saving valuable time.

Study results

Based on these six selected tasks, AutoCAD 2024 provides a level of productivity not available with AutoCAD 2019. Because AutoCAD 2024 is built with new features to enhance the 2D design workflow, you could realize immediate and substantial productivity benefits like those discussed in this paper.

With AutoCAD 2024, it is possible to save up to 58% of the 2D CAD working time when compared to AutoCAD 2019.**

Project tasks	AutoCAD 2024	AutoCAD 2019	Time Savings
1. Collaborating design changes in a DWG file	2:30	7:00	64%
2. Importing markups into drawing files	5:00	12:00	58%
3. Counting blocks in a DWG file	3:00	10:00	70%
4. Comparing external reference files (XREFs)	13:00	27:00	52%
5. Re-using design content with blocks	4:00	7:30	47%
6. Smart blocks: Placement and replacement	2:30	7:30	67%
Total Time	30:00	71:00	
Overall time saving with AutoCAD 2024			58%

(Figures shown in minutes and seconds)

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Conclusion

In this AutoCAD 2024 versus AutoCAD 2019 productivity study, the six design tasks analyzed represent just a few examples of how AutoCAD 2024 can provide tools and workflows to make you more productive.

In addition to the tasks completed for this study, an overview of additional productivity features introduced in AutoCAD 2024 are outlined in the following sections. This includes improvements to the user interface (UI) with updates to the Start tab, File tabs, and Layout tabs, along with the new Activity insights palette—all representing enhancements designed to help users achieve their outcomes within AutoCAD faster.

As these features represent improvements which could not be measured within this study’s parameters along with net new capabilities with no comparable process in AutoCAD 2019, they have been excluded from the main study results.

User interface enhancements: Start tab, File tabs, and Layout tabs

AutoCAD 2024 includes significant enhancements in the Start tab, File tabs, and Layout tabs when working in the AutoCAD interface. The time savings using these new tab enhancements are small when performed with one task. But when used cumulatively during a project, they will give significant time savings when incorporated into the day-to-day project workflow.

Start tab

The Start tab has been updated with enhancements to sort and search recent drawings, as shown in Figure 8.

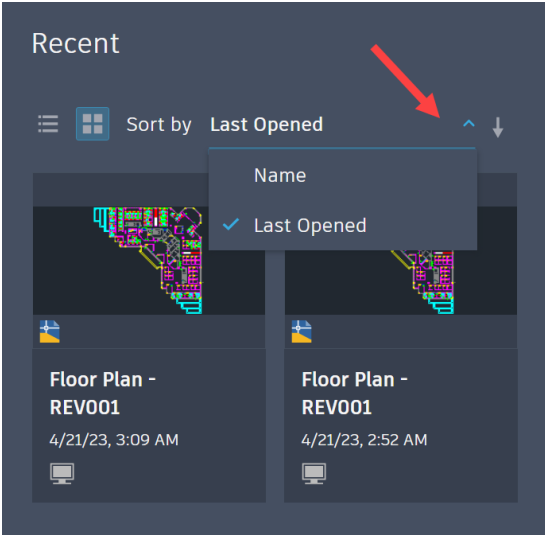


Fig.8 – The new Start tab layout

File tabs

File tabs have been updated to switch easily between drawings, create or open a drawing, save all drawings, and close all drawings. The File tab menu replaces the previous overflow menu, as shown in Figure 9.

You can also hover over a file name to see thumbnails of its layouts. Hover over a layout to temporarily display that layout and display icons for plotting and publishing, as shown in Figure 10.

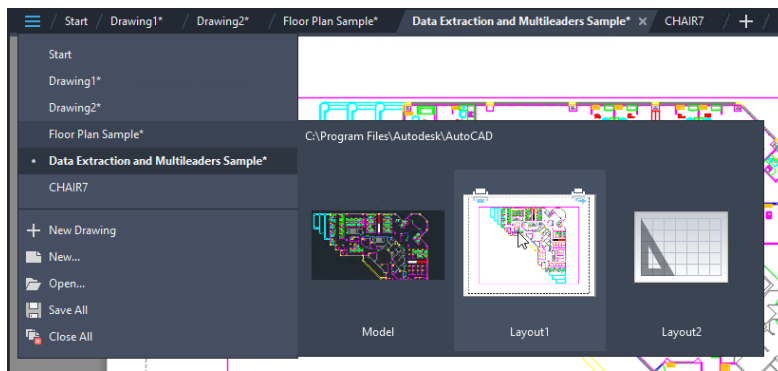


Fig.10 – The new File tab hovering over a drawing

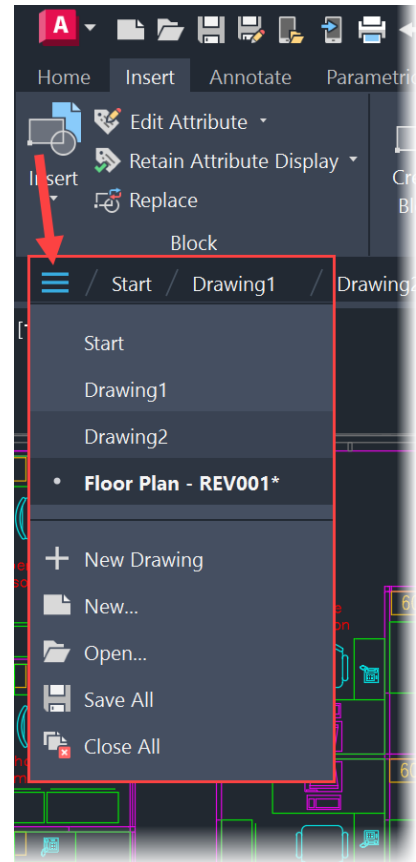


Fig.9 – The new File tab dropdown menu

Layout tabs

There is also a new menu for the Layout tabs in a drawing for faster, more effective access to the commands needed when working with Layout tabs in a DWG file. The new menu is shown in Figure 11. This menu can also be applied when working in the Model tab.

Results

Used over time, the new tab menus provide incremental savings as they are built into day-to-day AutoCAD workflows. This leads to long-term time savings.

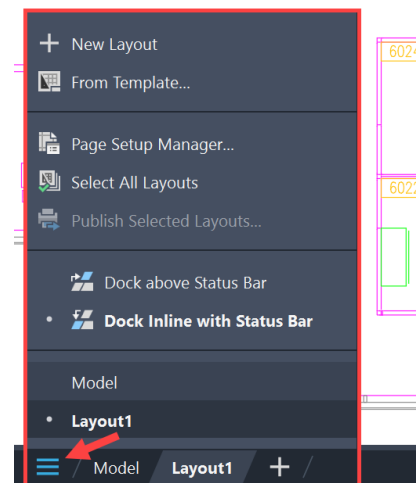


Fig.11 – The new Layout menu with a current layout

Activity insights

Along with the significant enhancements in the Start tab, File tabs, and Layout tabs when working in the interface, AutoCAD 2024 introduced Activity Insights. It is designed to provide CAD managers and drafters who collaborate with others on edits to a single DWG with information and opportunities to unlock considerable time savings.

Activity Insights tracks and logs commands and actions that you or others have performed within a DWG, such as when an XREF was added or the current DWG was XREFed elsewhere. It also tracks when a DWG was plotted or transmitted along with external actions, such as when a drawing is renamed or copied in Windows Explorer.

By providing useful information about your workflows and practices in an easy-to-use palette that works out-of-the-box with the file storage solution of your choice, managers and drafters can identify learning and development opportunities for staff along with new workflows to enhance overall efficiency.

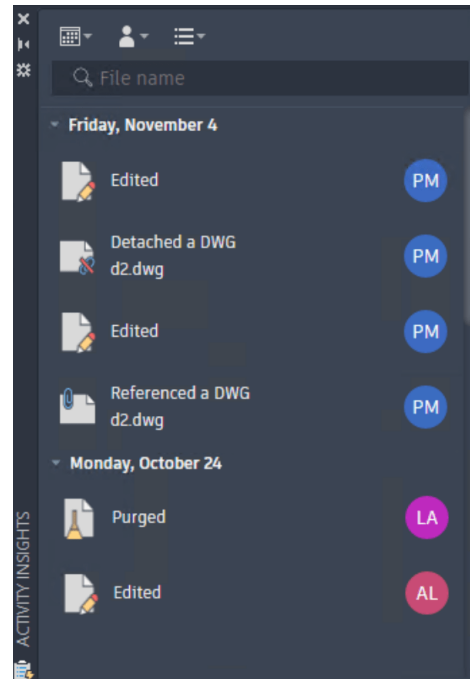
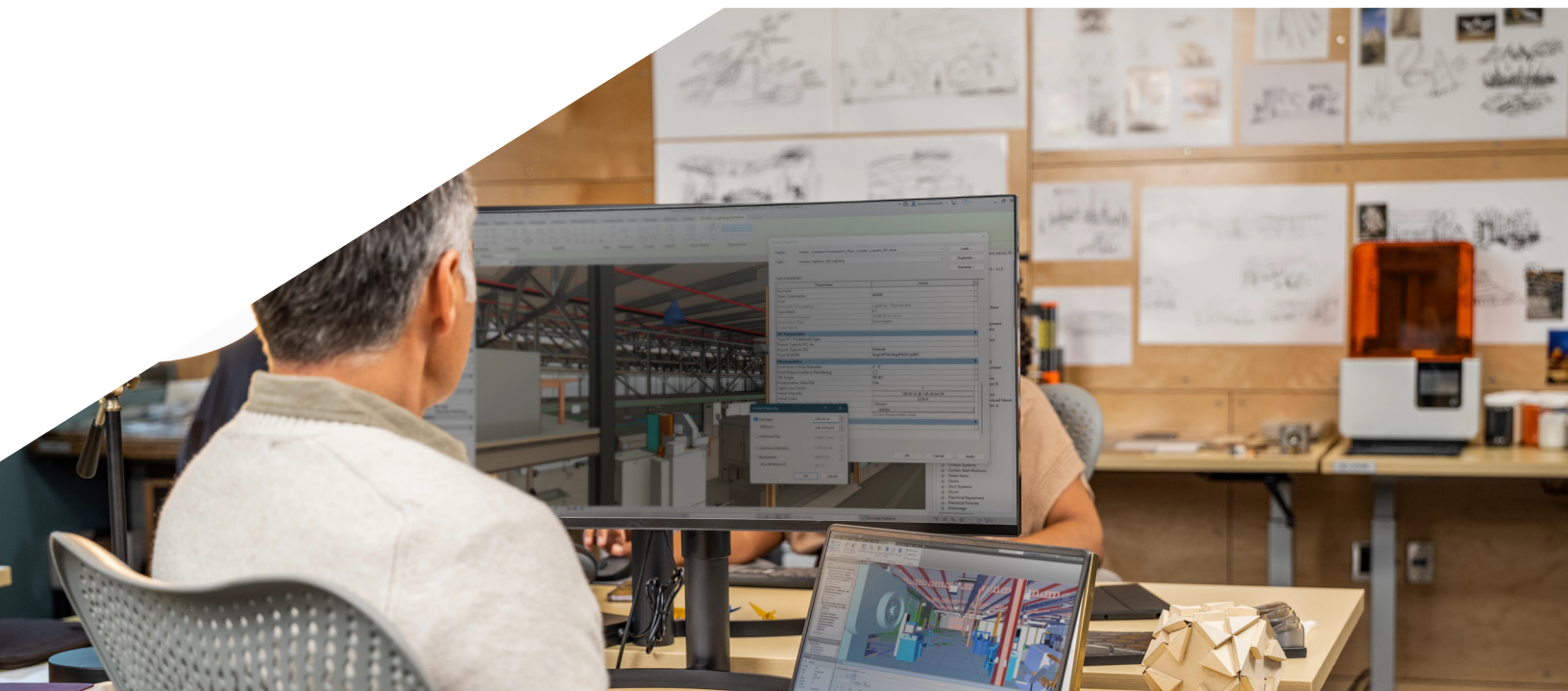


Fig.12 – The Activity Insights palette





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