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Trending Technologies

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HAPPY 2024!

This last year was like technology, it moved so fast that my head was spinning!

Our topic this month is 'trending technologies', and I happened to read an article recently, titled *18 New Technology Trends for 2024: New Tech Horizons* by Nikita Duggal. What drew my attention was the number "18". I had to read it to see what 18 things the author had come up with. The intention of this article was to discuss career availability in these 18 areas. There were a few items on the list that I'm going to mention, mainly because I hadn't realized these were trending technologies.

The first is "Digital Trust". This is something I can embrace because I really don't have "trust" for anything that is digital...lol. The author mentioned a large array of specializations where you can "create a safer space for digital users".

The second item that caught my eye was "Datafication", which is the transformation of everything in our lives into devices or software powered by data.

The third item that drew my attention was "Edge Computing", which is dealing with the shortcomings of cloud computing. I'm sure many of you are familiar with cloud computing and where it can go wrong.

The fourth (and last) item, which was completely off my radar was "Blockchain", which is described as data you can only add to, not take away from or change. In doing further research I found an entire article on Blockchain in the civil engineering, architecture, and construction industries. Blockchain has the potential to revolutionize information and construction management!

One idea that is common in discussing trending technologies is the disruption of our industries by these technologies. Disruption sounds bad, but as we all know, change can be good if properly planned for and implemented in a phased process.

This has made me stop and think, and I hope that it affects you similarly.

Sincerely,

KaDe

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AUGIWORLD (San Francisco, Calif.)
ISSN 2163-7547

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by: Brian Chapman

Trending Technology: 3ds Max and Content Creation

Today's landscape is marked by an unprecedented array of content generation possibilities, reflecting an era where adaptability, absorption, and transformation are key due to rapid technological advancements, increased knowledge sharing, software democratization, and AI progress. That is especially true in 3D content creation, where staying ahead of technological trends is beneficial and essential for success in this ever-evolving field.

SHADERS, RENDERING, AND MORE

The advancement of shader and rendering technologies, complemented by AI, enables creators to significantly enhance web and media visuals, targeting more immersive experiences. Notable examples showcase this trend in real-time. Meeting the developing standards for 3D web content requires considerable investments in development, browser capabilities, and visual content infrastructure, a reality that industry leaders increasingly recognize and work on.

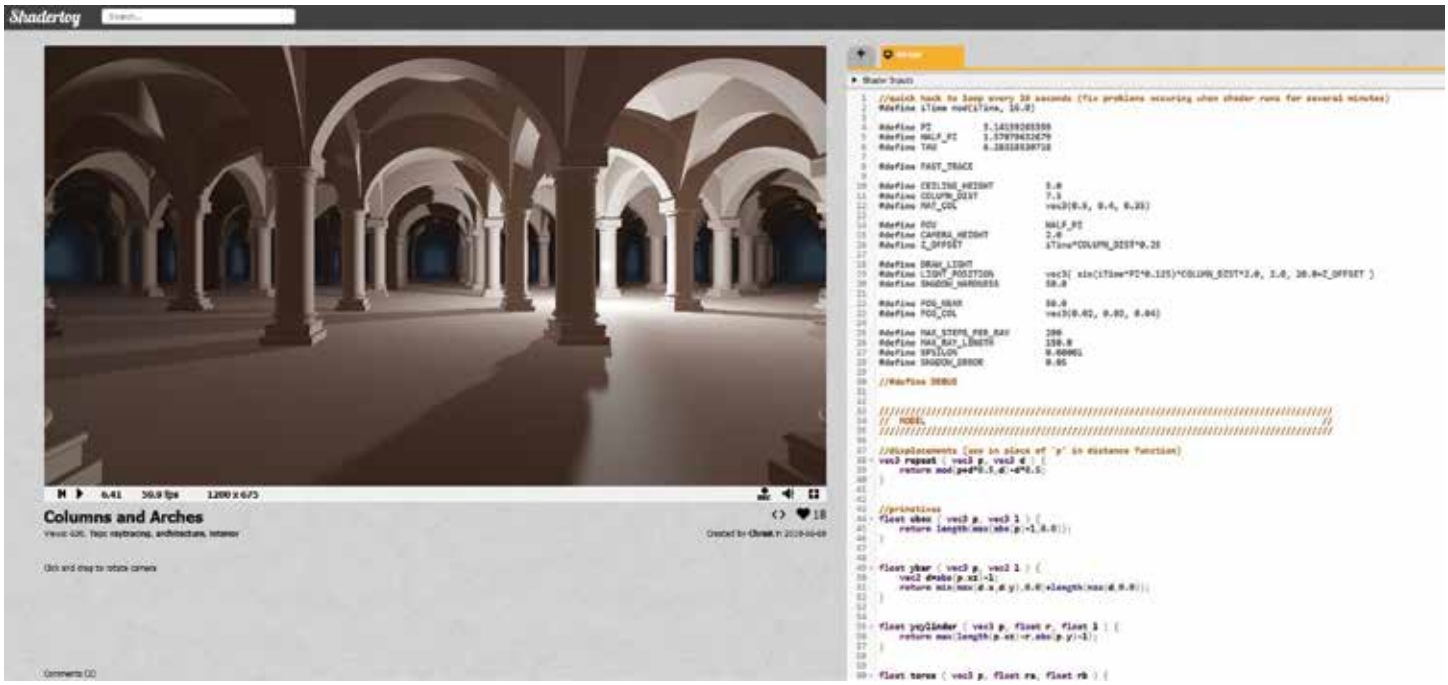

Figure 1

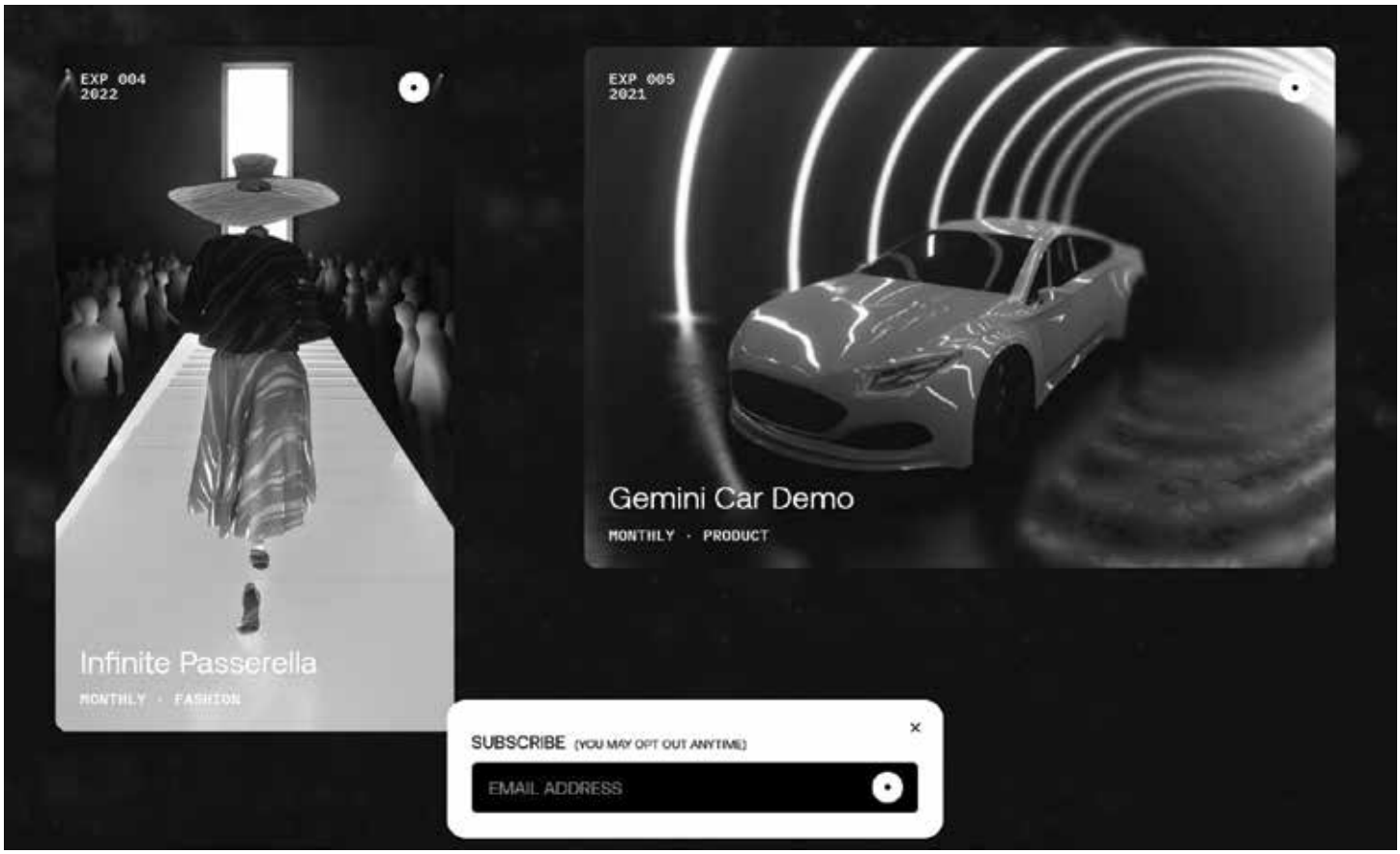

Figure 2

Users play a pivotal role in this technological evolution. Leveraging AI and tools like ChatGPT, they push the boundaries of shader development, laying the groundwork for complex visual data to shift from traditional desktop settings to dynamic, mobile-optimized formats. This transition is vividly observable on platforms like Shadertoy.com. Such user-led innovation is instrumental in sculpting the future of our interaction with and immersion in 3D content across various devices. For a current perspective on the impact of shader technology on immersive presentation, exploring sites like https://labs.lusion.co/ offers a glimpse into its progress.

For 3ds Max users, the power of shaders and 3ds Max's 2024 release is on full display on Korean VFX artist Changsoo Eun's website here: https://cganimator.com/usd-in-3dsmax-2-usd-stage/.

Figure 3

Figure 4

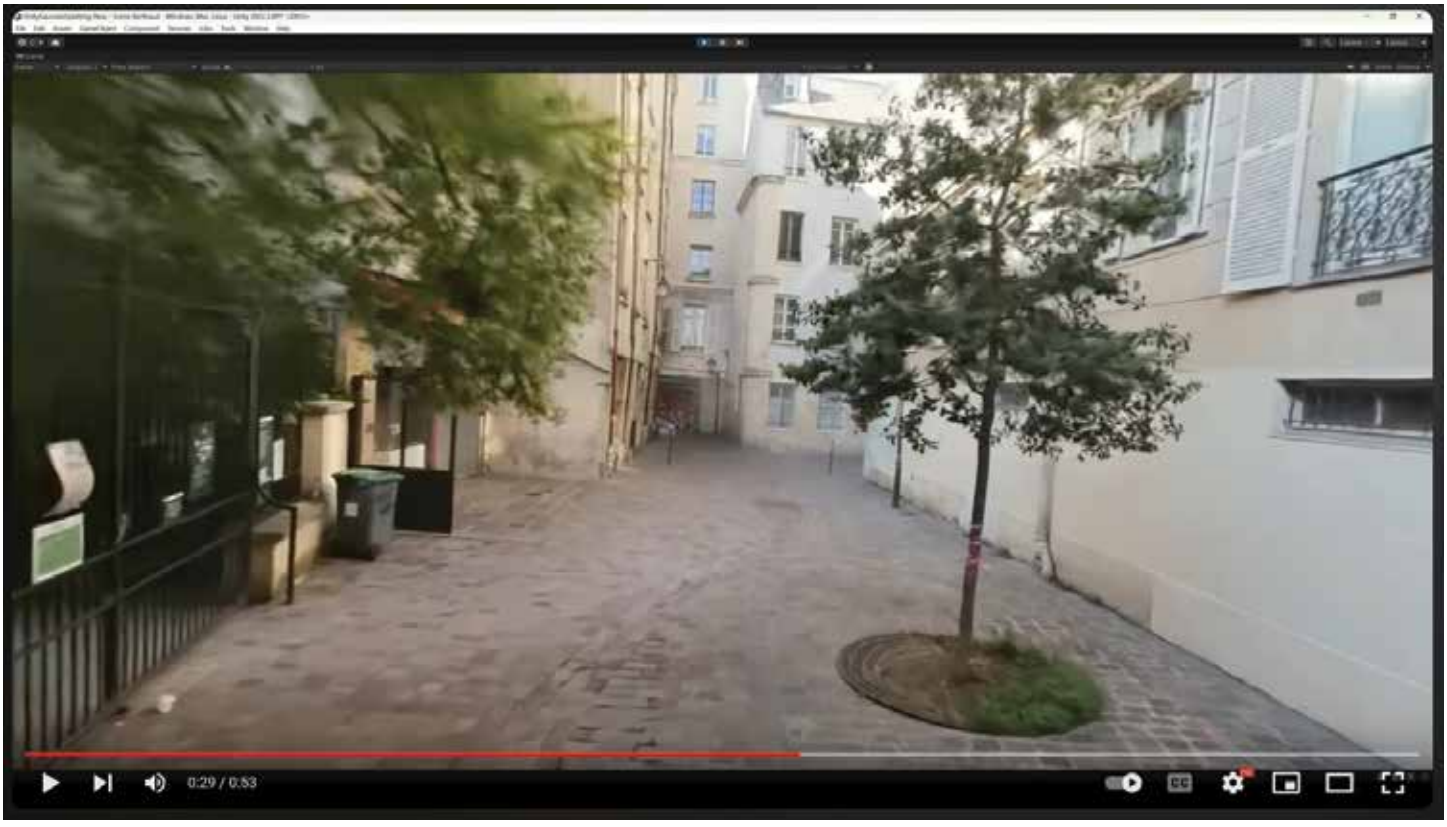

Figure 5

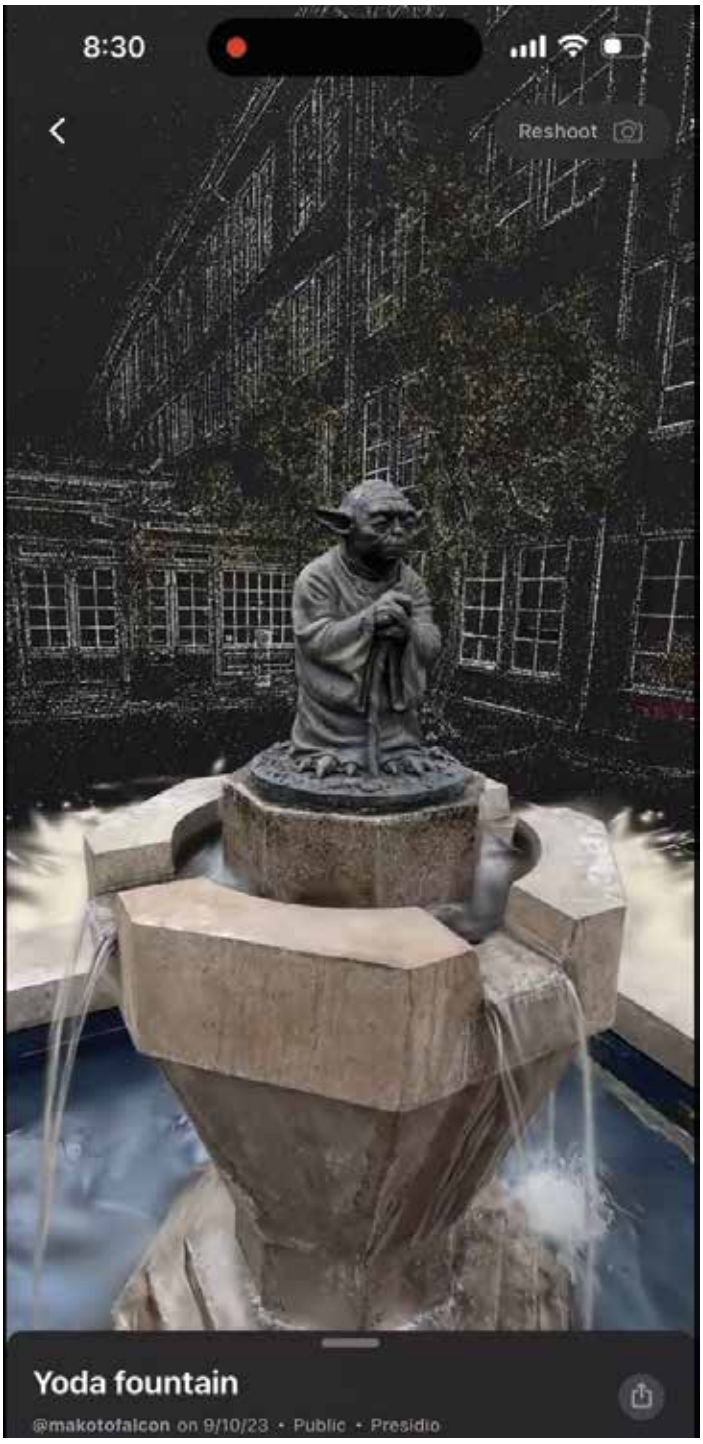

Figure 6

EXPONENTIAL OPTIONS

Fueled by the rapid advancements in today's technology landscape, novel innovations are increasing at an unprecedented pace. These innovative technologies offer elegant and practical solutions to tackle the intricate and laborious challenges of 3D content creation.

One trending area of advancement pertains to 3D visual representations, specifically the digital replication of landscapes and environments. Traditional 3D content typically exhibits substantial data volume, reaching tens or even hundreds of megabytes. This characteristic presents formidable obstacles when delivering 3D content to mobile devices, demanding significant investments in optimization and coding to ensure its successful presentation. Consequently, this diversion of resources diminishes the time available for refining features and enhancing the overall user experience.

However, a notable solution that has garnered substantial attention in recent times is Gaussian Splatting. Gaussian Splatting operates like a lidar scan or point cloud; nevertheless, it leverages imagery rather than discrete points and employs various techniques to blend these images seamlessly. The result is a visually stunning and intricately detailed environment, complete with leaves, shadows, reflections, and other attributes that conventional point cloud and lidar systems often struggle to capture, leaving such aspects unaddressed. However, it might help to consider Gaussian Splatting as a 3D photograph that can be implemented and utilized for an interactive experience, presentation, and navigation. It's not so viable for accurate measurement, where you'll want to rely on traditional lidar/scan technology. Check out Figure five for a screenshot demonstrating a 3D Environment using Gaussian Splat technology in Unity: https://youtu.be/GdAm6pijCDc?feature=shared.

As mentioned, the options continue to grow. Scan and image processing technology has reached epic heights, where collecting and utilizing 3D data is quite literally a click of a button. A great example is from Lumalabs.ai, which displays a Yoda fountain in Figure 6.

Brian Chapman is a Las Vegas 2D/3D design professional who creates content for the AEC industry, games, film, entertainment, and software development. Brian can be reached at procadman@pro-cad.net

by: Mark Kiker

Risky Things

Continuing with Secrets that Tech Mangers keep, we come to the ones that put you or your firm at risk. These are the concerns you carry that might keep you awake at night. They pop into your head from time to time or they nag at you from the back of your mind. They are the little ticklers that don't let you rest. They fall under your area of oversight, but not always under your control.

CRITICAL FILES ARE IN THE WRONG LOCATION

You have standards and guidelines in place, and you remind staff to use them all the time, but they just keep putting things in the wrong place. They download files from the internet and use them from the download folder on local. They open files from their email client and try to work with them by double clicking and expect to hit save and have them go to the right place automatically. They work directly from external USB sticks. They store things on external drives. They link/reference files or models from other projects. Things quickly get tied up in digital knots that you must untangle.

What to do about it – Education and vigilance is the best approach to this issue. Make sure that everyone knows where things go. Make it easier to put things in the right place by automation, menus, and features that get it right. Scan the project files to find out of place entities. Pay attention to Unresolved References in Revit and fix them. Tell others how you troubleshoot issues when you get a chance and have them do it also. Look for non-standard naming as a clue to bad habits. Don't let them linger. I always seem to get bit by the things I do not fix right away.

THINGS SHOULD BE AUTOMATED THAT ARE NOT

Folks are defining processes on the fly. Even when you have them written down and refined. They forget or just don't care, and they make up a way to get things done that does not work the same way as the last time they did it. I am not talking about constant improvement or refining steps that are not working at peak performance. They are a good thing. I am discussing the things that people do that get you into trouble. They may work, but they are not consistent. Inconsistent methods cause chaos. No one knows what to expect from one project to the next.

What to do about it – The best way to comply with guidelines and standard is through automation. By taking control of the protocols, procedures and steps in any process, you enable repeatable actions. You make it easier to get it right. You should be

outlining the means and methods that are used by your staff. Procedures do not stifle creativity, they actually free up staff to be more creative by taking care of the details. Brush up your scripting skills, your coding prowess or your menu customization and get things in line.

SHADOW TECH MANAGEMENT

Everyone working in tech knows that there is tech support going on that you know nothing about. When people have a tech issue or problem, they do not always come to you. They ask the person next to them. Then the person down the hall. They just want an answer and to get back to being productive. They will take an answer from anyone that offers it. When multiple people start asking an advanced user, they sometimes work apart from you rather than alongside you. Then they veer off the beaten path and start autonomous processes that are not in line with the firms or your protocols. They have followers and they feel like they are helping.

What to do about it – Realize that people helping people is a good thing. Don't fight it, embrace it. You want staff to help other staff, as long as they are helping in the right way. You should encourage those who are more mature in the tech tools to help the newcomers. Keep your ears and eyes open for parallel tech support efforts by non-tech staff.

Keep expanding your inclusion of staff who like to help others. Empower them. Make sure they know what they should and should not be doing. Let them know that they should keep you informed of issues and what they do to help. Keep them in the loop and keep an eye on them. Take corrective action if they seem to be taking liberties or stepping across boundaries. Some of the best support people started out by helping the staff they work around. You want to build into that, as long as they are team players. When they start going off the rails, gently address it with them.

DELAYED SOFTWARE UPGRADES

You risk falling behind if upgrades are delayed too long. Some staff want to jump on the newest release the minute it rolls out. Others never want to move. The concerns come when there is a delay in an upgrade so long that you are no longer compatible with other firms or your clients. File and model exchange and coordination become troublesome. New features pile up making it harder to train when you finally transition due to the number of items that have training needs. Support from the vendor may be curtailed from their end and every time you need their help, they say, "You need to upgrade to the latest release."

What to do about it – If you are the one delaying, then you need to remember that the company and your staff look to you to lead. You need to prep and deploy. Most of the time it is not the Tech Manager who drag their heels. If it is for financial reasons, then plan a budget for next year and keep pressing for the funds. Make small enhancements in the old tools to keep the desire there. If it is upper management, then talk about the new tools and lay out the improvements that would come so they know things would get better. Don't nag, but consistently mention the need to upgrade. Let them know that the risk of delays is greater than the cost of the change.

There are risky things going on, but you don't have to be the only one worrying. These are secrets you don't want to keep. These should be addressed and discussed in a wider forum. Bringing in others can improve many of these. Now that I am at the end of my "Secrets" series, I ended up with fifteen. I probably have more, but these will suffice. How many more secrets do you keep?

Mark Kiker has more than 30 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. He is an internationally known speaker, writer and former AUGI Board member and president. Mark is currently serving as Chief Technology Officer for SIATech, a non-profit public charter high school focused on dropout recovery. He oversees two web sites, www.caddmanager.com and www.bimmanager.com. He can be reached at mark.kiker@augi.com and would love to hear your questions, comments and perspectives.

by: Grant Dott

Bricsys 24/7® & BricsCAD®

Perhaps you are a small to medium size business. Your CAD/Design projects consist of five, maybe six team members (or less). You could be a manufacturing company maintaining your tooling and workflow areas on the shop floor, trying to apportion space, so the bean counters know how much the space is worth in relation to the manufacturing process. Retailers also face similar challenges in laying out their product lines through seasonal changes and promotional events. These are of course just a few of the many projects that a Common Data Environment (CDE) can be used to manage the drawing and design files. Projects don't need to be large with thousands of files to reap the benefits of a CDE. Small projects can also benefit, even if the projects are internal.

In this article, I will take you through a simple space planning project using Bricsys 24/7® and BricsCAD®. We will do this, not as an exercise to necessarily learn these tools, but to see the effect they can have when used together.

SETUP OVERVIEW

For this example, we will use the shop floor of a manufacturing business to illustrate the project. After the master space plan is created, we will make some changes using Bricsys 24/7® on a mobile device to make some annotations (markups). Basically, this is an elementary paperless communication exercise where all changes are visible to all stakeholders. In other words, a complete project history in the cloud.

Before we start, a project called 'Space Plan' has been set up in Bricsys 24/7, with a folder called 'Spaces'. (See Fig. 1)

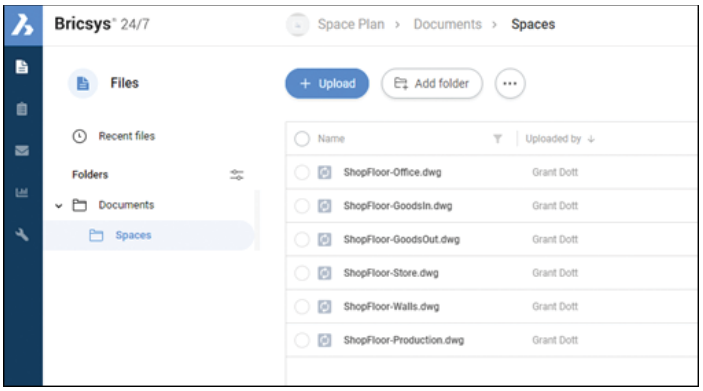

Figure 1

A floor plan showing the facility walls has been created, along with another five drawings, containing five simple polylines, each on a different layer, representing the five different floor spaces. (i.e., Goods In, Goods Out, Store, Production, and Office)

A master drawing will be created to show the complete facility with each of the individual floor space drawings attached as External Reference Files (Xrefs).

All these drawings will be stored on Bricsys 24/7, be accessible to all stakeholders (internal and external) and be our 'Single Source of the Truth' for all project activities.

PROJECT OVERVIEW

Figure 1 also shows the individual space plan drawings in the Bricsys 24/7 project. Take note that the 'The Work in Progress (WIP)' files sit in a network drive.

After the 'ShopFloor-Master.dwg' has been built using the WIP plans attached as Xrefs, we then upload the 'ShopFloor- Master.dwg' to the folder for all stakeholders to see and comment on, both on the web and mobile.

BRICSYS 24/7 PANEL

Let's take a look at the ShopFloor-Master.dwg in BricsCAD, complete with the WIP space plans attached ss Xrefs. (See Fig. 2)

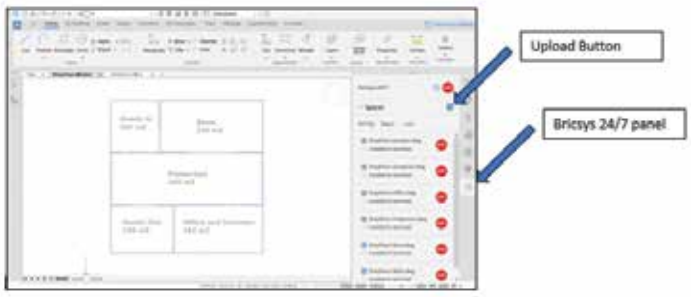

Figure 2

After selecting the Bricsys 24/7 panel, the previously loaded drawings in the project appear under the folder 'Spaces'.

After selecting the 'Upload' button, (+), the 'ShopFloor-Master.dwg' is uploaded to the Bricsys 24/7 project for web and mobile viewing.

The Bricsys 24/7 Panel is a view of the Bricsys 24/7 project contents. From here drawing files can be uploaded or downloaded, by anyone with access. A locking mechanism allows drawings to be worked on while being guarded from being overwritten. Multiple stakeholders can access and work on different drawings, knowing they are protected.

BRICSYS 24/7 WEB INTERFACE

Here is a view of the 'ShopFloor-Master.dwg' in Bricsys 24/7, web interface. (See Fig. 3)

Figure 3

Now that the basic existing floor spaces have been identified, when changes are required to allocate space to accommodate production changes, Bricsys 24/7 has become our paperless communication portal.

Accessing the 'ShopFloor-Production.dwg' drawing on our mobile device gives us a paperless freedom to make comments (Annotations), that indicate changes that need to be made to the Production space.

TRACKING CHANGES

Notice two Annotations (red boxes) have been added to the Production space made on the mobile device asking for two further sub-spaces to be created, Pre-Production and Quality Assurance. (See Fig. 4) These annotations are now available for viewing on the website. (See Fig. 5)

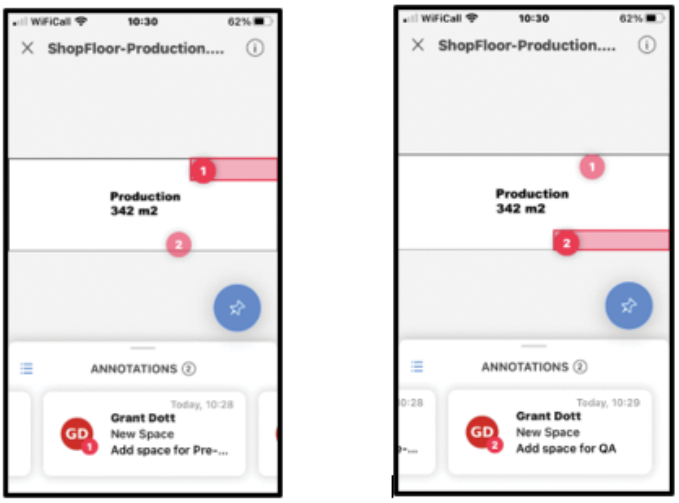

Figure 4

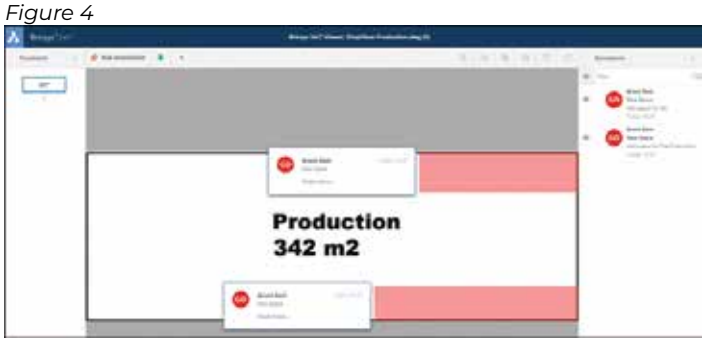

Figure 5

All stakeholders with permission can view these changes and, if necessary, make further changes or add notes as required. The designers, in charge of keeping the WIP drawings up to date, will make the changes to the 'ShopFloor-Production.dwg' and then upload to Bricsys 24/7, keeping the single source of the truth intact.

VERIFYING UPDATES

Let's view the updated Bricsys 24/7 web and mobile interface. (See Fig. 6 & 7) Also, look at the updated 'shopFloor-Master.dwg' and 'ShopFloor-Production.dwg', showing the new space allocations.

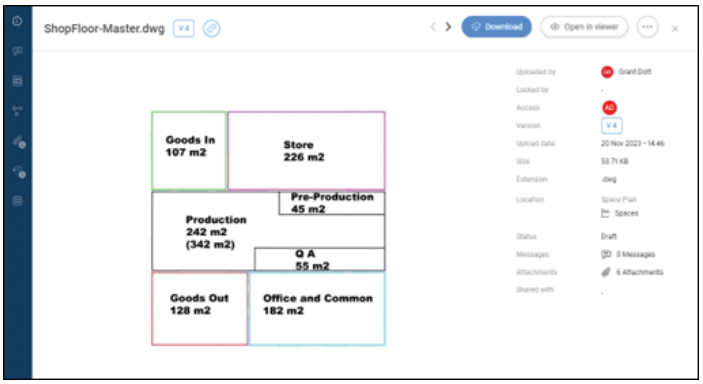

Figure 6

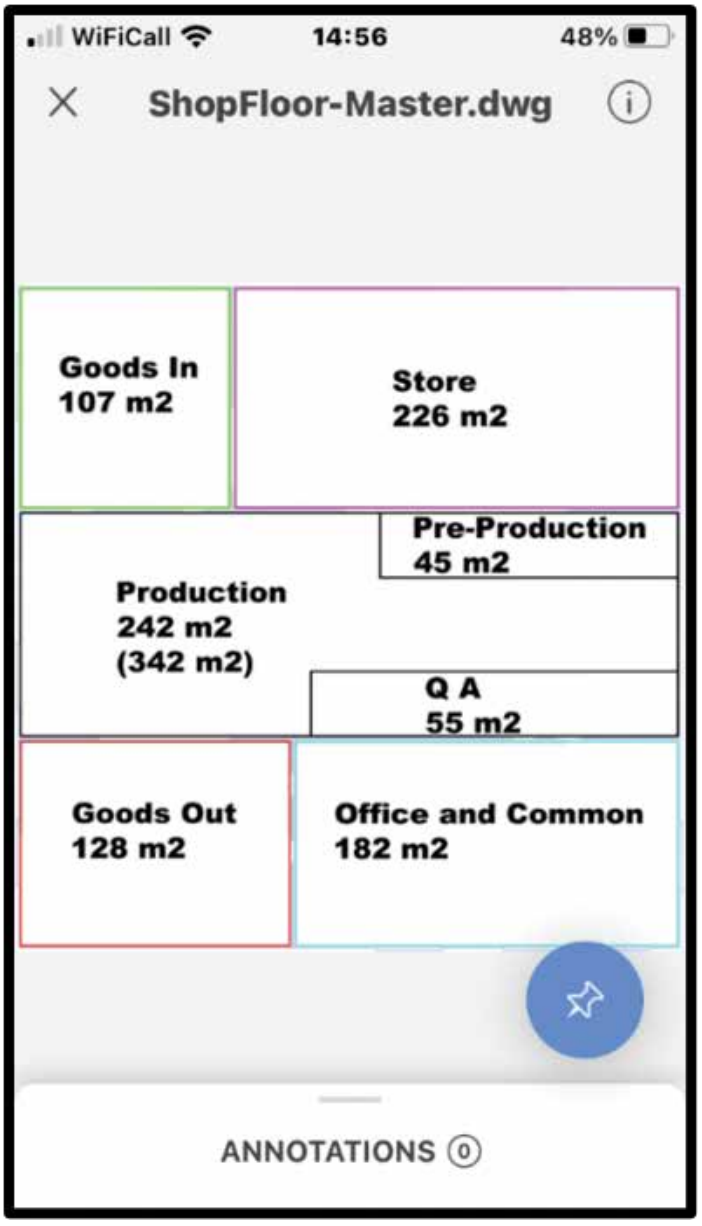

Figure 7

Consider that different teams or companies can each work on a separate space drawing. When these drawings are uploaded to Bricsys 24/7, they

are given a revision number. The 'ShopFloor-Master.dwg' is controlled by Xrefs of these drawings and each time it is uploaded to Bricsys 24/7, it will be given a different Revision number. All this controlling the single source of the truth.

Also, important to mention is that there is no substitute for a good set of drawing standards and project protocols that highlight the change process activities.

BRICSYS 24/7 & BRICSCAD

As simple as this exercise in paperless communication is, consider the possible workflows for larger and more complex projects. After all, aren't complex projects just made up of smaller, less complex projects? Together Bricsys 24/7 and BricsCAD combine very easily to maintain, distribute, and store project documentation. And yes, there is much more here than just what I have demonstrated. Bricsys 24/7 is a full Project CDE complete with Version Control, Workflows, and many other functionalities you would expect in a CDE.

Project communication can be straightforward. It can be up to date. It can be maintained by multiple stakeholders, and it can, be paperless. Most importantly, it doesn't need to be a blocker. It doesn't need to be cumbersome, time-consuming, and most of all, it doesn't need to be a headache to set up or access. Fortunately, these are all of the qualities of BricsCAD and Bricsys 24/7.

MORE ABOUT BRICSYS 24/7®

Bricsys® 24/7® is a cloud-based common data environment for document management and workflow automation. Bricsys 24/7 offers role-based security and unlimited users to help ensure that the right document is in the right hands at the right time. Easy-to-use document management and hosting platform for your construction projects. As a project management information system, utilizing our automated workflows and custom forms to handle project management tasks or as a common data environment for all contract documents, drawings, and project workflows enables transparency for all stakeholders and bridges the design and construction phases. Add unlimited users to your projects. Every project member can access the Bricsys 24/7 file store, with their access rights based on their role in the project. Learn more about Bricsys 24/7 by visiting https://www.bricsys.com/247.

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MORE ABOUT BRICSYS®

Bricsys®, part of Hexagon®, is the global technology company that creates the BricsCAD® family of computer-aided design (CAD) products and the Bricsys® 24/7 project collaboration platform. We are relentlessly committed to the success of our customers by offering cost-effective, mission-critical CAD software with industry-leading product support. Learn more at www.Bricsys.com.

Hexagon® is a global leader in digital reality solutions. Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us @HexagonAB.

Mr. Grant Dott is a Global Implementation Specialist and Consultant at Bricsys. He is a part of the EMEA Brisys team based out the the UK. Grant has a strong client-facing background with the ability to adapt and focus across many disciplines and environments. Grant has a demonstrated history of working in the computer software industry, skilled in BricsCAD, AutoCAD, Production Management, Construction-based cloud technologies, and Software Development. Grant can be found on YouTube, promoting BricsCAD and demanding that you let him show you how.

by: Paul Li

Dialog Fun Facts

GAME CHANGER

As I mentioned in my last article, *Free Samples – The Halloween Edition*, it was a GAME CHANGER when Autodesk in 1992 released **AutoCAD r12**. This popular DOS based CAD product not only introduced a whole new graphical user interface (GUI) as a facelift, but it also gave to the developers the ability to customize their own GUI using **AutoLISP**. This is also a huge win for the typical AutoCAD user. Now instead of blindly responding to prompts at the command line, dialog boxes would appear on the screen for user input. Since after multiple decades later the same programmable dialog box function continues to be implemented in the current version of AutoCAD, let's explore the many fun facts available for AutoCAD users to take full advantage of this feature.

FUN FACT #1

The first fun fact I would like to point out is that customizing your own dialog boxes in AutoCAD is not complicated at all. There are only a few very simple lines of code that is needed to make a custom dialog box appear in AutoCAD.

First of all, custom dialog boxes in AutoCAD are defined in a separate dialog control language (dcl) file with a **.dcl** file extension. Since a dcl file just contains text, any text editor like the **Windows** built-in **Notepad** program can be used to create and edit a dcl file. Each dialog box must be given a unique name which is case sensitive. For example, the text content for a dcl file named **MyDclMin.dcl** can just have this single line of code:

MyDclMin : dialog { ok_only; }

In this example, **MyDclMin** is the unique name I'm using for this custom dialog box. Though not required, the dcl file name in this case matches with the custom dialog name. The **ok_only** tile is already predefined in each and every version of AutoCAD since r12.

Next, there's just a couple of lines of AutoLISP code needed to invoke the **MyDclMin** dialog box. At the AutoCAD command prompt enter the following line of code exactly as shown followed by pressing the **Enter** key on the keyboard:

(setq dcl-id (load_dialog "MyDclMin.dcl"))

Note: This assumes **MyDclMin.dcl** is saved in one of the folders listed under AutoCAD's **Options** command, **Files** tab and **Support File Search Path** (see Figure 1).

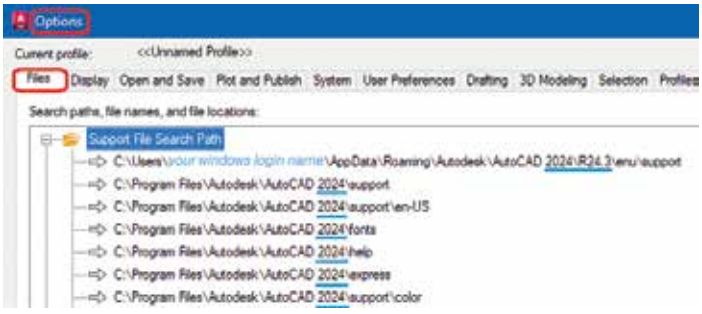

Figure 1-Search Path

This first line of code uses the **load_dialog** function to load the dcl file **MyDclMin.dcl** (file name is not case sensitive).

Then, enter this line of code at the AutoCAD command prompt followed again by pressing the Enter key to execute it:

(new_dialog "MyDclMin" dcl-id)(start_dialog)

The **new_dialog** function locates the unique dialog name **MyDclMin** (this is case sensitive) from within the dcl file and the **start_dialog** function launches the dialog onto the screen. Note: In this line of code make sure that there are no spaces between the close and open parenthesis. The **MyDclMin** dialog box appears as shown (see Figure 2).

Figure 2-MyDclMin

Notice that a custom dialog box does not require a title nor any other messages to be displayed but at a minimum a single button that closes or dismisses it from the screen. In this example there are two ways to close the dialog box: (1) click the **OK** button and (2) press the **ESC** key on the keyboard.

After the dialog is dismissed the AutoLISP function to remove the dialog from AutoCAD's memory is:

(unload_dialog dcl-id)

That's all there is to it. Congratulations, you've just successfully completed your first custom dialog box! It's as simple as that. Of course, the above lines of code assumes that there are no errors in locating the dcl file and loading the dialog named **MyDclMin**.

FUN FACT #2

The second fun fact I would like to point out is that the **ok_only** tile that's predefined in AutoCAD is designed to help developers quickly generate custom dialog boxes without having to create code from scratch. Why reinvent the wheel when you don't have to? But to understand how this all works, it's important to dig a little deeper and find out what lines of code actually makes up the **ok_only** tile. Then you can create your own custom tile for your dialog boxes.

The predefined lines of code can be found inside a file called **base.dcl** which is typically installed under Windows user login profile and per the AutoCAD version:
"C:\Users\windows-login-profile\AppData\Roaming\Autodesk\AutoCAD Version ##\Release ##.#\enu\Support\base.dcl"

Since the **base.dcl** file is a text file just like any other dcl file, it can again be opened for viewing or editing using the **Windows** built-in **Notepad** program. Doing a search within **base.dcl** for **ok_only** reveals the following lines of code (see Figure 3):

```
ok_only : column {          ——— this is a column
    fixed_width = true;     —— width is fixed
    alignment = centered;   — centered
    : ok_button {           ——— reference this tile
        is_cancel = true;   — ESC key closes dialog
    }
}
```

Figure 3-ok_only Tile

The code here predefines some basic attributes for the **ok_only** tile such as: (1) this is a column with a fixed width, (2) the alignment is to be centered and (3) the dialog can be dismissed when the **ESC** key is pressed. This also shows that the **ok_only** tile references another tile called the **ok_button**. Doing a search for the **ok_button** within the **base.dcl** file shows the following lines of code (see Figure 4):

```
ok_button : retirement_button {  ——— reference this tile
        label          = "  OK  "; — button's label
        key            = "accept"; — used in AutoLISP action code
        is_default     = true;  ——— selected after Enter is pressed
}
```

Figure 4-ok_buton Tile

Here, again there are more attributes assigned to this tile such as: (1) the button's label, (2) the key AutoLISP references for action and (3) the button is automatically selected when the **Enter** key is pressed. This again shows that the **ok_button** tile references another tile called the **retirement_button**. Doing a search for the r**etirement_button** within the **base.dcl** file shows the following lines of code (see Figure 5):

```
retirement_button : button {  ——— this is a button
        fixed_width     = true;  —— width is fixed
        width           = 8;  ——— width size
        alignment = centered;  ——— centered
}
```

Figure 5-retirement_buton Tile

We finally reached the source of the code that makes up the entire predefined **ok_only** tile as a button with the following attributes: (1) a fixed width, (2) the maximum width is 8 and (3) is center aligned.

When looking through the rest of the contents of **base.dcl** you'll discover many additional **ok** tiles

that all follow similar coding patterns such as:

ok_cancel
ok_cancel_help
ok_cancel_help_info

Now let us see how the dialog appears when these three though different but similar predefined tiles are used in lieu of **ok_only**. For this example, I'm going to name the dcl file **MyDcl.dcl.** The content this time consists of the following:

```
MyDcl1 : dialog {
    label = "Title: Ok Cancel";
    ok_cancel;
}
MyDcl2 : dialog {
    label = "Title: Ok Cancel Help";
    ok_cancel_help;
}
MyDcl3 : dialog {
    label = "Title: Ok Cancel Help Info";
    ok_cancel_help_info;
}
```

Notice that I've made the following additions and or changes this time: (1) the single dcl file contains not one but three different dialog names, (2) under each dialog name now shows a label to define the title that appears on the dialog box and (3) each dialog box definition has now expanded from a single line to multiple lines. Now let's execute the following line of code at the AutoCAD command prompt to load it:

(setq dcl-id (load_dialog "MyDcl.dcl"))

Like before, this assumes that the **MyDcl.dcl** file is saved in a folder that is in the AutoCAD Support File Search Path. Then similar to the previous example, enter the following line of code to launch the dialog onto the screen:

(new_dialog "MyDcl1" dcl-id)(start_dialog)

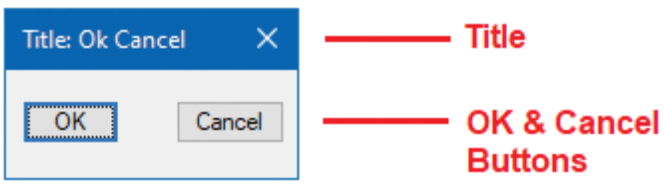

Figure 6-MyDcl1

The custom dialog that appears this time comes from the dialog named **MyDcl1**. This includes a unique title at the top of the dialog labelled as **"Title: Ok Cancel"** and an additional **Cancel** button. To close the dialog, you can click either the **OK** or the **Cancel** button and the ESC key on the keyboard.

To invoke the second dialog named **MyDcl2** you don't have to execute the **load_dialog** line again since we have not unloaded the **MyDcl.dcl** file from AutoCAD's memory. So, all that's needed to bring this up on the screen is this single line of code:

(new_dialog "MyDcl2" dcl-id)(start_dialog)

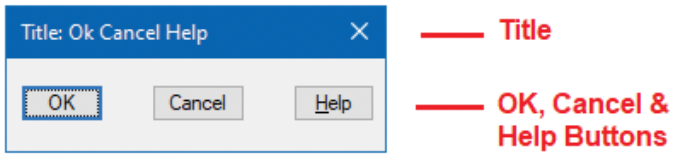

Figure 7-MyDcl2

For **MyDcl2** in addition to the difference in the title which now shows **"Ok Cancel Help"**, a third button labelled as **Help** is shown. But unlike the **OK** and the **Cancel** buttons, the **Help** button does nothing when clicked. The reason for this is because there's no predefined action assigned to the **Help** button in either the dcl or the AutoLISP code.

Finally, a similar line of code can be entered to bring up the **MyDcl3** dialog:

(new_dialog "MyDcl3" dcl-id)(start_dialog)

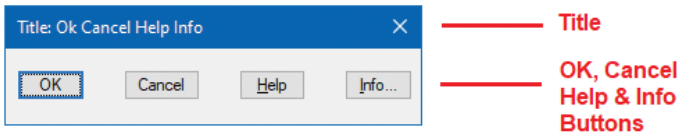

Figure 8-MyDcl3

Just like the previous dialog, **MyDcl3** shows a **Help** button. But this time there's a fourth button labelled as **Info** which again has no action assigned. Only the OK and **Cancel** buttons when clicked perform the action of closing or dismissing the dialog box.

This demonstrates how simple it is to use predefined tiles in custom dialog boxes to show different buttons. Also, this should give you an idea as to the code required to create your own button. In the next section I'll show an example of a dialog box using a custom ok button.

FUN FACT #3

The third fun fact I would like to point out is that there's actually another more flexible method of working with dcl files. When dialog boxes were

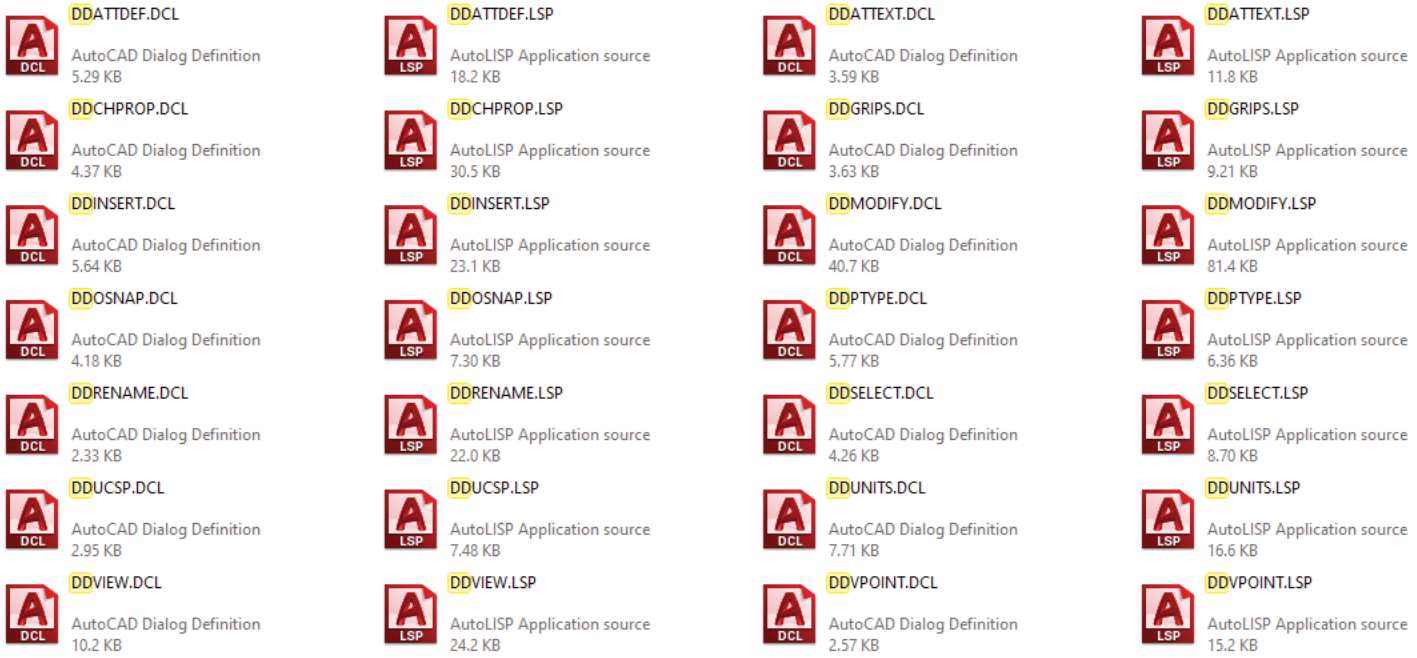

Figure 9-DCL & LSP Files

first introduced in 1992 Autodesk presented the dcl files as if they needed to be permanently stored as separate files in order for them to function with their accompanied lisp programs (see Figure 9).

This methodology comes with the following shortcomings:

(1) the dcl file can be accidentally deleted

(2) the dcl file could be accidentally left behind during lisp file transfers

(3) the dcl like the lsp file must be located in a folder that the AutoCAD program can find

But what I've learned early on is that this is not really necessary. Instead, we can use AutoLISP functions to do the following:

(1) create a dcl file in a designated folder

(2) open and write the lines of code needed to define a custom dialog box

(3) delete the dcl file after the dialog is dismissed

So, for this final example using entirely AutoLISP functions, I'm going to create a dcl file called **MyDclBox.dcl** which contains all the lines of code needed to make a dialog box named **MyDclBox** appear on the screen. Let's start off with entering this AutoLISP code at the AutoCAD command prompt to designate the "temporary drawing path" as the location to create **MyDclBox.dcl** file:

(setq dcl-file (strcat(getvar"tempprefix")"MyDclBox.dcl"))

Next, the AutoLISP **open** function can be used to start writing content into the dcl file by entering the following at the command prompt:

(setq fw (open dcl-file "w"))

This is then followed by the next series of lines of code using the **write-line** function to create all the code needed for the **MyDclBox** dialog:

```
(write-line "MyDclBox : dialog {" fw)
(write-line "label = \"Title: My Message\";" fw)
(write-line ": button {" fw)
(write-line "label = \"My Okay\";" fw)
(write-line "key = \"accept\";" fw)
(write-line "is_cancel = true;" fw)
(write-line "is_default = true; " fw)
(write-line "}" fw)
(write-line "}" fw)
```

Notice that some of the quotation symbols within the dcl code are now preceded with a back slash. This is required so that an actual quotation mark is written as content into the dcl file.

Lastly, the following AutoLISP **close** function is executed to finish the file writing process:

(setq fw (close fw))

The **MyDclBox.dcl** file now contains the lines of

code as shown (see Figure 10).

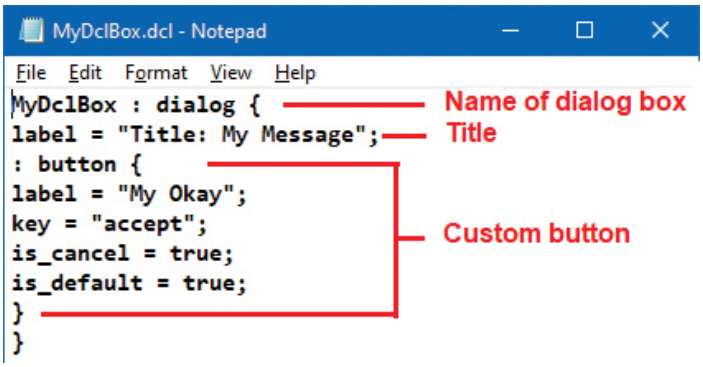

Figure 10-MyDclBox dcl]

In addition to the custom dialog name and title, as I mentioned earlier, I've now included code to define my very own custom button with the following attributes: (1) the label is **"My Okay"**, (2) the dialog can be dismissed by pressing the **Esc** key and (3) the dialog can be closed by pressing the **Enter** key.

Next, like in previous examples here are the lines of AutoLISP code needed to load and invoke the **MyDclBox** dialog box at the AutoCAD command prompt:

(setq dcl-id (load_dialog dcl-file))
(new_dialog "MyDclBox" dcl-id)(start_dialog)

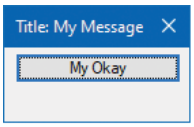

Figure 11-MyDclBox

In addition to having a custom **"My Okay"** button the **MyDclBox** also includes a unique title at the top of the dialog labelled as **"Title: My Message"**. Since attributes are defined in the **My Okay** button, clicking on it or pressing the **ESC** key on the keyboard closes the dialog box.

After the dialog box is dismissed run the AutoLISP function to remove it from AutoCAD's memory:

(unload_dialog dcl-id)

Finally, the AutoLISP generated dcl file can be erased from the temporary drawing path location using the following function:

(vl-file-delete dcl-file)

Note: In order for AutoLISP functions that start with the letters **"vl"** to execute successfully this may need to be executed first:

(vl-load-com)

Now you've learned the simple steps of using AutoLISP functions to create the dcl file on the fly and then delete it from storage after the dialog box is closed.

GAME ON

Autodesk has made customizing AutoCAD dialog boxes literally available at your fingertips. With just a few lines of code you can immediately see graphically on the screen the works of your labor. Now that you've learned how easy it is to customize and invoke your own dialog boxes within AutoCAD, I hope your reaction is the same as mind. It is now GAME ON!

Mr. Paul Li graduated in 1988 from the University of Southern California with a Bachelor of Architecture degree. He worked in the Architectural field for small to midsize global firms for over 33 years. Throughout his tenure in Architecture, he has mastered the use and customization of AutoCAD. Using AutoLISP/ Visual Lisp combined with Dialog Control Language (DCL) programming he has developed a number of Apps that enhance the effectiveness of AutoCAD in his profession. All the Apps actually came out of meeting challenging needs that occurred while he worked in the various offices. He has made all the Apps available for free and can be downloaded from the Autodesk App Store. Though he recently retired from the Architectural profession, Paul continues to write articles depicting his past work experience. Some of these articles can be found in AUGIWorld Magazine where he shares his knowledge learned. Paul can be reached for comments or questions at PaulLi_apa@hotmail.com.

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by: Rina Sahay

The Best of Both Worlds - A South Asian BIM Goddess in the United States

As a child, I was raised in the United States. When I was six years old, my parents relocated back home to India. 30+ years, a Bachelor's degree, and a family later - I landed in the United States with the two permitted suitcases and an acceptance to a Master's program. A major pivot point in my life was when, upon debarking, the Customs officer's response to me introducing myself was a warm, "Welcome back!"

Spending the next two years learning and adapting in the sheltered cocoon of a university town was a stimulating experience. Then came the real world, where I realized that I was facing significant challenges. Not only was I interviewing in the job market with a group of much younger counterparts but hiring me would pose a legal challenge to my potential employer who would then be required to sponsor me.

Given my upbringing, adapting to the language and food were the least of my problems. The culture I had lived in for most of my life did, however, impede an understanding of the American ways of working and thinking. A behavior, expression or colloquialism which would have been acceptable in India was offensive in the United States. The strange name and unusual accent did not help - to this day I only introduce myself with my first name.

As a result, instead of an opportunity in industry, I chose to accept an opportunity as a post-secondary level educator with an employer who was eager to sponsor me and where my age was regarded

as an asset. Later, edged out of full-time teaching by a trend that favored hiring Adjunct Faculty, I even worked, believe it or not, in a bank! With my quadrilingual abilities (in addition to English, I have native fluency in three other Indian languages) I was the top performer in my region aided by my ability to communicate with and assist customers from many South and Middle East Asian countries. That was the most fun I'd had in a long time! The day I put in my notice to accept the position of BIM Specialist - my manager cried....

Here came another significant pivot point in my life - walking into a major Architectural firm, hoping they didn't realize that what I knew about Architectural software as taught in the classroom bears no relation whatsoever with its application in industry. And there I met my mega Superpower - Revit - among other digital tools of the trade. I joined the Revit Forums. I was a sponge. I asked questions, networked, learned. This marked the beginning of an amazing professional trajectory for me.

Attending my first AU in 2017 was another exciting pivot point for me. Being active and effective in the Autodesk Revit Forums had a couple of interesting side effects. I would get unexpected hugs from unknown people thanking me for having helped them with their projects! Passersby on the Venetian escalators asked me why I'm not an Expert Elite - and the following year I was invited to be an Autodesk Expert Elite. After that, I was asked - now that I'm an Elite, why am I not presenting? So, guess what? I now write, blog, and present, in addition to being The BIM Goddess with all the answers for my colleagues in my organization!

So, let's talk about the superpowers I honed along the way -

- I now have developed an American side in addition to my Indian side.
- I have cultivated essential survival skills in being adaptable and thinking out of the box.
- I have refined the discretion to pick and choose the best from my Indian and American sides as needed.
- I can speak and think in multiple languages, pick up and drop accents at will.
- I have expertise at being comfortable while acutely uncomfortable outside my own culture.
- I am an introspective Indian lifelong learner - and an extrovert hard working American.

At AU2021 I participated as a panelist in the award-winning roundtable discussion - "**Becoming a True JEDI: Allyship for Justice, Equity, Diversity, and Inclusion**". A question from the audience was - "How can we be more sensitive as JEDIs?" My answer was - remember that all you need to be sensitive is something simple - recognize the person behind the social awkwardness, the unusual name and the strange accent. Establish eye contact. Give them a smile. Say Hi. Recognize their abilities and participation. You just might be surprised!

Here's what I would like to say to my other South Asian counterparts in the New World - **make your presence felt.** Be prepared for guardedness, possibly outright rejection. Let that be the motivation to outperform and outthink everyone. Be the best at what you do. Watch out for and grab any opportunity that you see to work your way up to the top. Remember that you now have two worlds of information and wisdom to pick and choose the best from. And finally - take refuge in your culture when the stress hits - there's no stress buster like Bollywood!

Rina Sahay is an Autodesk Expert Elite Team member; a Revit Certified Professional; and a Revit and AutoCAD Subject Matter Expert. As the Architectural BIM Manager at Fishbeck, she creates and maintains BIM standards; provides project support and troubleshooting; training and onboarding. Rina is an educator at Kalamazoo Valley Community College; provides technical support for Revit, AutoCAD, and 3DS Max via the Autodesk forums and Directly.com; and serves on the Kent Career Technical Center Advisory Board. She was a Top-Rated Speaker at AU2021 and has presented multiple times at Autodesk University, in Autodesk Community Conversations, and for In Awe Towards Green; and is the author of the LinkedIn blog "Rina's Random Revit-isms".

by: Stephen Walz

Industry Convergence

From sustainability to new business models, and from wellness to emerging technologies, IFC can be a force for good, driving the AEC industry to new levels of achievement, writes Casey Rutland, Chair of buildingSMART UK&I and founding director of Digital Green

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There's much to be said about convergence. In our particular sphere of influence, we're living through a convergence of need, technologies and capabilities. It's an exciting time to be influencing the direction of a sector.

There's a lot of chatter online and in person about data, about IFC (Industry Foundation Classes), and about the challenges people are experiencing when it comes to data use and translation.

We say this is a good thing! If people are openly discussing the use of a globally recognised data structure for the built and natural environment (IFC), it means people are using it.

But many more could be using it, if only they were aware of its uses. It's much more than a 3D model that you can open in different software. IFC is a data model, one that can be opened in a text editor, linked, interrogated and presented in many different ways to meet your particular use case.

To be serving this industry of ours as it undergoes this digital transformation is an honour. It's exciting to be promoting better information management and the use of open standards to an industry where some are blissfully unaware of their existence. Every day, we can see the improvements that result from these efforts.

WHERE IS THE NEED?

The need is relative. It ranges from 'I just want to finish my work and go home on time', to 'How can we meet the United Nations' Sustainable Development Goals?', and everything in between.

The need can be (and is) driven by individuals, projects, companies, industries, governments, economies and by nature.

Global awareness of the environmental challenges we're facing, the pandemic we've all been living through and continue to deal with on a day-to-day basis, and the current increase in the cost of living are all issues that can be better understood and solved with data-driven decisions and actions.

The situation couldn't be more urgent. Put simply, the time is simply not available for us to approach these challenges in an analogue manner. The need for us to use data to solve them is here, right now. But how do we create the data we need, ensure it can be trusted and use it positively?

When it comes to sustainability, it's clear from many indicators that the industry – and society at large – is more aware than ever that we need to take immediate action. The impact our industry can have on this issue is huge. Data is needed across a vast range of topics in order to better understand how we can change and what the benefits might be. Whether it's decarbonisation, material selection, post-occupancy evaluation, flood analysis, historic preservation or energy system specification, a standard data language reduces duplication, increases interoperability and standardises validation.

In terms of health and safety, the recent Building Safety Act that gained Royal Assent in May, along with its accompanying secondary legislation, calls for information in a 'golden thread'. During design & construction stages, information exchanges include the information (including evidence) relied upon to demonstrate that a building satisfies all the applicable building regulations. During occupation, meanwhile, the information relied upon in making the safety case and to demonstrate that building safety risks as defined are identified, will need to be exchanged, checked and managed.

Moving on from safety, wellness is an increasing concern. Particularly as we continue to emerge from the pandemic and into recovery, some organisations are now prioritising the health of their people and spaces. Through an ESG (environmental, social & governance) approach, data is central to providing and sharing the proof that their efforts are achieving the desired results. In doing so, these organisations are contributing to financial savings and wider benefits for the communities in which they operate.

Then there's the economic climate and its impact on doing business. Material, product and energy prices are spiralling, making data not just a 'nice to have', but also an asset in itself. Data (and information management) is vital to the operation of any business. When treated as an asset, it can be linked and used throughout all business operations - providing clarity and offering the ability to make more informed decisions. Being able to interrogate IFC datasets across multiple projects to spot trends and to better quantify or calculate their impact, assured data can quickly prove its worth at an organisational level.

Finally, there are new business models to consider. If data is indeed the 'new oil' (or, as David

Some members of the buildingSMART UK&I team at Digital Construction Week in May

McCandless puts it, the 'new soil'), then being the guardian of valuable data offers the opportunity for traditional businesses in our industry to become more data-centric in the services they offer. Stepping into a new world of digital business models that exploit data and serve it to clients as insight is an option that would have previously been impossible. Structured data and information management is at the heart of that.

TECHNOLOGY MATTERS

In the construction and built environment business, the data model and schema used is called IFC. IFC is an international standard, ISO 16739, and is governed by buildingSMART International.

The IFC schema has been developed through an international effort over a period of 25 years, to achieve consensus about how assets are described and what properties are required to adequately describe them.

Emma Hooper explains more about IFC in "What is IFC" article in an upcoming *AUGIWORLD* article.

The risk of course, is that organisations beginning their journey are developing their 'own' data model – one that does not connect to others, one that is less secure and one that the supply chain would need to learn. From our point of view, this could be a disaster.

Using a standard data model approach means that the data we create is not locked into proprietary software, or indeed locked into one company's systems. It can instead be exploited by other technologies for greater insight into built environment assets, helping to achieve better outcomes.

The proven ability of standards to generate trust is of utmost importance here. Our industry has a patchy history when it comes to trusting data and many are hesitant to rely solely on something they may not fully understand - even if they appreciate that it is 'probably' a better way of working. A transition period is required for familiarity to build and for trust to grow.

Many aspects of that trust lie in security - without a thought given to just how insecure some of our traditional working practices have been. People are quick to assume that 'open' data is somehow less secure. In reality, a standard data model will be more secure, given that security-sensitive data can be filtered (it's always where it should be and easily searchable) and redacted prior to publication.

Open standards could also help companies in our sector to achieve their longer term technology ambitions. Sensors, apps, services, solutions and other inputs and outputs are being developed in initiatives (some may view them as silos) around our industry. The heavily invested-in worlds of proptech, contech, machine learning, artificial intelligence, digital twins, robotics and smart 'things' are all hugely active in our industry. Yet relatively few companies are aware of the rich stream of structured data that could help them develop much more scalable solutions.

Now is the time to act. We're spreading the word to include these other digital transformation initiatives and helping to support their uptake.

But while general awareness is increasing, there's still so much to do, so many more people to reach. In an ideal world, we wouldn't need to work so hard at spreading the word. Professionals could simply go about their business and the technology would take care of the data side. But we're not in an ideal world - not yet at least. And at the same time that we're busy digitally transforming an industry, we're also working hard to retain the hundreds of years of experience that already exists and ensure it gets passed on to the next generation of people and tools.

In the software industry, the maturing understanding of OpenBIM benefits are also more apparent. There are open source applications being developed for all sorts of uses. For more on this, read Dion Moult's article on BlenderBIM in an upcoming *AUGIWORLD* article.

When it comes to individuals, our industry is fortunate to have many thought leaders, champions and grafters. I'm lucky enough to work with many of them in the buildingSMART UK & Ireland chapter. For those who want to demonstrate their experience and understanding of the whole process, professional certification is now available through approved training providers, delivering courses specific to the UK & Ireland market and with openBIM at their core. If you'd like to learn more, see Read's introductory article to certification in an upcoming *AUGIWORLD* article.

NEXT STEPS

While the majority of people may first encounter IFC as a way of exchanging 3D model data in a construction project, they soon realise that the benefits are far wider reaching.

We recognise there are both perceived and real challenges in adopting an IFC approach. And we know we must continue to address these, by providing resources and help where we can. But we must also progress the discussion about data and its benefits in the short, medium and long term – that's where the value lies.

As an organisation reaching out into industry, we do still see resistance to adoption in places, but there are also people and companies on their own OpenBIM journeys already making significant changes to their working methods. There are also pockets of excellence, with demonstrable proof in the buildingSMART International Awards submissions. You can see past finalists and winners in the yearbooks at *www.tinyurl.com/bsi-awards*.

So this is our call to action: Get in touch with us to discuss how IFC and OpenBIM can help you work more effectively, with better outcomes.

BuildngSMART UK&I would also like to thank everyone for their contributions to this IFC Special Report.

In memory of Richard Petrie, CEO of buildingSMART International

In April we learned of the sudden and sad passing of Richard Petrie, CEO of buildingSMART International.

Richard not only took forward buildingSMART to become a serious player in digital construction, by bringing together a global industry with the goal of using a common data language, but provided constant encouragement and help to many individuals. He will be missed and fondly remembered.

We dedicate this special report to you Richard.

by: Jason Peckovitch

Revit Tech Trends

In the ever-evolving realm of the architecture, engineering, and construction (AEC) industry that we live in, the transformative power of technology is redefining how we conceive, design, and construct the built environment. At the forefront of this technological revolution stands Autodesk Revit, a pivotal tool that has become synonymous with Building Information Modeling (BIM). As we navigate through 2024 and peer into the horizon beyond, it becomes imperative for professionals in our field to comprehend and harness the latest trends in Revit technology.

Revit, with its ability to seamlessly integrate various facets of the design and construction process, has been a staple of the industry for the last 20 years. In this article, we will delve into the current technological landscape of Revit in 2023, exploring the advancements that are shaping the industry from cloud collaboration to generative/parametric design. We will dissect the present state of Revit technology and lay the groundwork for what lies ahead. As we look into the future, emerging trends such as AI, AR/VR, machine learning and large language models promise to reshape the very foundations of how we conceive, collaborate, and create within the industry we all live and breathe. Join us on this journey through the currents of Revit technology, uncovering the innovations that are propelling the industry into a new era of efficiency, collaboration, and sustainable design.

Starting off our discussion on the latest trends in Revit technology, it is essential to acknowledge my previous stance expressed in last month's article. I maintain my viewpoint that Autodesk must adopt a visionary approach, thinking beyond conventional boundaries, or make way for another company to spearhead the much-needed innovation in the industry. Despite the recent announcements at Autodesk University, I believe we have yet to witness the groundbreaking and unconventional thinking required for true innovation.

CURRENT TRENDS

Cloud Collaboration

Autodesk Construction Cloud (ACC) stands as a platform that extends the capabilities of Revit into the cloud, transforming collaboration and project management in the AEC industry. The continuous updates and features within ACC are instrumental in redefining how teams collaborate, coordinate, and manage projects in a seamless and integrated environment.

One of the standout features within ACC is Model Coordination, a tool designed to enhance collaboration and reduce clashes in complex construction projects. In the context of Revit, Model Coordination allows project teams to detect and resolve clashes and discrepancies within the BIM models, fostering a clash-free design environment. This feature not only streamlines the coordination process but significantly reduces the likelihood of issues emerging during construction. Model Coordination enables the automatic detection of clashes between various design disciplines, ensuring that architectural, structural, and MEPF elements are harmoniously integrated. By consolidating clash detection and resolution within the Autodesk Construction Cloud, Revit users can streamline the coordination process, resulting in more accurate and efficient project delivery.

ACC seamlessly integrates with Autodesk Docs, offering Revit users a common data environment (CDE) for cloud-based collaboration and design management. This integration simplifies real-time collaboration, version control, and model sharing, enabling project teams to work simultaneously on Revit models. The seamless connection with Autodesk Docs ensures that the collaborative advantages extend beyond the Revit environment, spanning the entirety of the project lifecycle.

Autodesk Construction Cloud also provides features for quantification and estimating through Autodesk Takeoff, offering a comprehensive solution for cost management in construction projects. In the context of Revit, this feature allows users to extract quantities directly from the BIM model, enhancing accuracy in cost estimation and facilitating more informed decision-making. The seamless integration of quantification and estimation tools within the cloud environment ensures that project stakeholders can align cost-related data with the latest Revit models.

The Project Home feature in Autodesk Construction Cloud serves as a centralized hub for project information, providing an overview of the project's status, recent activities, and key metrics. In conjunction with the Insights feature, Revit users can gain valuable data-driven insights into project performance, design trends, and collaboration metrics. This holistic approach enhances transparency and project visibility, allowing teams to make informed decisions based on real-time data.

Autodesk Bridge for Revit is a powerful tool within Autodesk Construction Cloud that enables the connection between Revit models and construction project management sharing sheeting and files across projects or even across different accounts. This feature facilitates a more efficient exchange of information between the design phase in Revit and the construction phase managed in the cloud. This integration ensures that design intention is preserved throughout the project's duration, fostering collaboration between design and construction teams.

GENERATIVE DESIGN

Generative design, a concept that has evolved significantly in recent years, finds itself deeply integrated into the fabric of Revit technology in 2023. Originating from the intersection of computational design and advanced algorithms, generative design tools are now actively shaping the exploration and optimization of designs within the Revit environment.

Revit's integration of generative design tools, often bolstered by cloud computing capabilities, allows architects and designers to leverage algorithms to explore a multitude of design options. Autodesk Construction Cloud further enhances this integration by providing a platform where generative design processes can be seamlessly executed and evaluated. This convergence enables professionals to generate innovative design alternatives based on specified parameters, transforming the way design concepts are conceived and refined.

The current trend in generative design is not just about automating the design process but is focused on enhancing design exploration and optimization. Revit's generative design capabilities, coupled with cloud resources, enable architects to quickly evaluate numerous design iterations. This iterative approach empowers designers to discover unconventional solutions, optimize for various criteria such as cost and sustainability, and ultimately arrive at more efficient and innovative designs.

PARAMETRIC DESIGN

In the realm of parametric design, Revit technology has experienced significant advancements in 2023, providing architects and designers with powerful tools for creating highly customized and complex design scenarios.

Revit's parametric modeling capabilities have evolved to allow for more intricate and sophisticated design expressions. With enhanced parametric tools, architects can create complex geometric forms, adapt designs to changing parameters, and establish relationships between various elements in a project. Autodesk Construction Cloud facilitates the collaboration and sharing of these parametric models in real time, ensuring that all stakeholders are working with the most up-to-date design parameters.

The trend in parametric design applications within Revit extends beyond basic form generation. Architects and designers can now customize designs for overly complex scenarios, such as intricate building envelopes, structural systems, or interior layouts. The ability to parameterize and customize designs in Revit, combined with cloud collaboration features, allows for a more streamlined and collaborative approach to handling intricate design challenges, fostering innovation and efficiency in the design process.

EMERGING TRENDS AND FUTURE OUTLOOK

As we gaze into the future of Revit technology, several emerging trends promise to reshape the landscape, driven by cutting-edge technologies and innovative solutions from Autodesk.

AUTODESK AI

On the heels of Autodesk University, a significant and transformative trend comes into focus—the seamless integration of artificial intelligence (AI) into the fabric of the Revit and Autodesk ecosystem. At the forefront of this paradigm shift is Autodesk's steadfast commitment to leveraging AI, not just as a tool, but as a catalyst for enhancing design workflows. The overarching goal is to bring about a change in thinking where AI becomes an integral component, streamlining processes, automating repetitive tasks, and optimizing decision-making within the Revit environment.

This strategic infusion of AI capabilities into Revit holds the "promise" of revolutionizing how professionals tackle design challenges. It goes beyond mere automation, offering predictive insights, advanced automation features, and intelligent analysis. Imagine an era where AI stands as an indispensable assistant, collaborating seamlessly with human ingenuity to enhance creativity and efficiency across the architectural, engineering, and construction fields. This exciting trend signifies a future where AI is not just a technology but a powerful ally, reshaping the landscape of design and construction.

SUSTAINABILITY AND ANALYSIS WITH AUTODESK FORMA

Autodesk Forma, a recent addition to Autodesk's evolving toolbox, not only redefines the conceptual design phase within the Revit ecosystem but also amplifies capabilities for sustainable design. Leveraging generative design principles, Forma empowers architects to explore diverse design alternatives based on specified criteria, fostering a more iterative and innovative approach in the preliminary stages of project development. This transformative trend foresees a shift towards a dynamic, data-driven conceptual design process, enabling architects to rapidly generate and refine ideas while considering various project constraints.

What sets Forma apart is its recent integration of analytical features, such as Wind, Noise or Day Light to name a few. This offers architects the ability to not only explore various design alternatives but also assess their performance in real-time. This innovative addition enhances the tool's functionality, providing architects with valuable insights into the structural and environmental implications of their designs during the conceptual phase. As a generative design tool, Forma not only facilitates conceptual exploration but also goes a step further, ensuring that sustainability is not just a conceptual goal but an analytically informed reality from the project's inception.

This forward-looking approach aligns seamlessly with the industry's heightened consciousness towards creating structures that are not only aesthetically pleasing but also environmentally responsible. The integration of Forma into the Revit ecosystem signifies a comprehensive approach where conceptual design, sustainability, and analytical insights converge. This synthesis exemplifies a commitment to innovation and environmentally conscious practices within the architecture and construction fields, solidifying Forma's role as a dynamic and comprehensive tool for architects navigating the complexities of modern design.

LARGE LANGUAGE MODELS IN AEC

The integration of large language models, such as ChatGPT inspired by advancements in natural language processing, is poised to revolutionize communication and collaboration within the AEC industry. Future iterations of Revit may incorporate language models to facilitate more intuitive interactions with the software. This could include features like advanced natural language queries, where users can articulate design intentions in plain language and receive immediate responses from the software. This trend envisions a more user-friendly and accessible interface, breaking down communication barriers between professionals of diverse expertise within the AEC industry.

AUGMENTED REALITY (AR) INTEGRATION

The integration of augmented reality into the Revit ecosystem represents a groundbreaking trend that enhances the visualization and communication of design intent. AR enables professionals to overlay digital models onto the physical environment, offering an

immersive and interactive experience. With tools such as Autodesk Construction Cloud and Navisworks integrating AR capabilities, users can visualize Revit models on-site, facilitating better communication between stakeholders and improving decision-making during the construction phase.

VIRTUAL REALITY (VR) IMPLEMENTATION

Virtual Reality is rapidly becoming an integral part of the design and presentation process within Revit. VR implementation allows users to experience a fully immersive and three-dimensional representation of their designs. Software such as Enscape and Prospect by IrisVR which was, you guessed it, rebranded to Workshop XR, seamlessly integrates with Revit, enabling anyone on the design team or their clients to virtually walk through spaces, assess design details, and make informed decisions before construction begins. This trend not only enhances design visualization but also streamlines the approval process by providing a more intuitive understanding of the final product.

MACHINE LEARNING FOR PREDICTIVE ANALYSIS

Machine learning applications are increasingly finding their way into Revit workflows, offering predictive analysis capabilities. Predictive design tools leverage historical project data and machine learning algorithms to anticipate potential challenges and outcomes. For instance, tools like Autodesk's Construction IQ can analyze design data to predict potential issues or identify high-risk RFIs, while driving quality control and helping architects and engineers make informed decisions during the early design phases. This trend holds the promise of streamlining decision-making processes, reducing errors, and optimizing project outcomes.

CONCLUSION: SHAPING THE FUTURE OF REVIT TECHNOLOGY

In the current trend landscape, Revit is described not as static but as a tool in the process of adaptation, incorporating technologies to enhance its capabilities and impact how professionals approach conceptualization, collaboration, and shaping the built environment. Despite this depiction, a prevalent sentiment suggests that Autodesk's updates for Revit are falling short in delivering innovative enhancements. The envisioned future for Revit still promises the convergence of innovation, efficiency, and sustainability, allowing professionals to embark on a transformative journey toward more intelligent, collaborative, and environmentally conscious practices. However, there is a growing concern that Revit's trajectory lags behind the industry's evolving needs. As these trends unfold, questions arise about whether Revit genuinely remains at the forefront, propelling the AEC industry into a future where creativity thrives boundlessly, and the digital and physical realms seamlessly intertwine. I guess only time will tell of what is to become.

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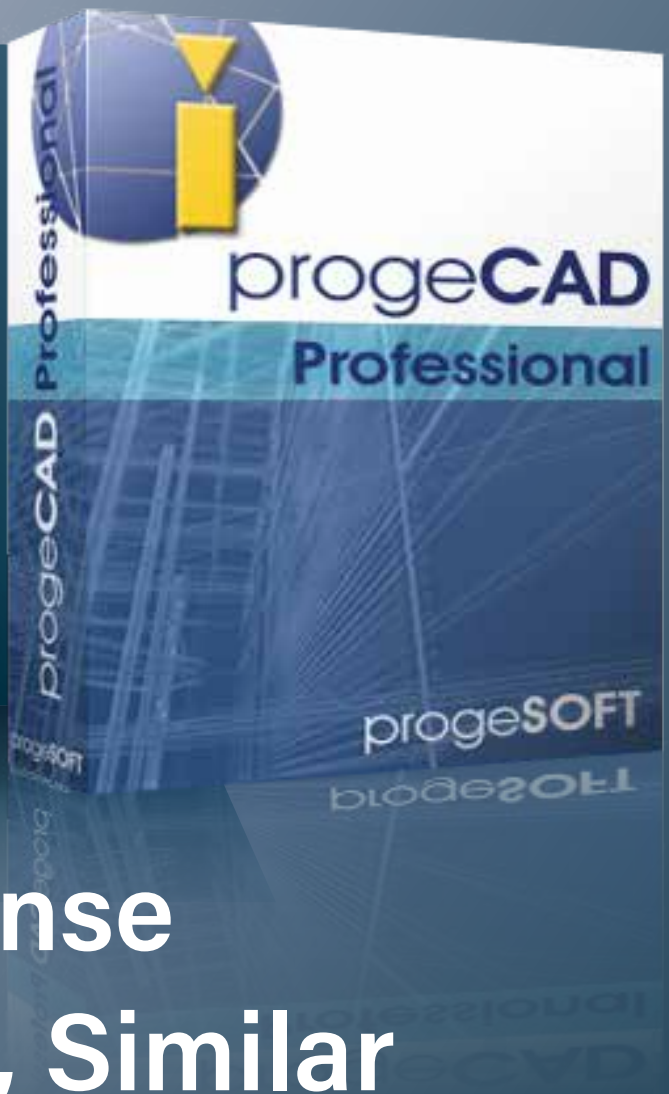
2D/3D DWG EDITOR



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Meet DraftSight 2024

In the world of CAD design, change is a constant companion. Every year, new features and capabilities step onto the stage, promising innovation, and improvements. Today, we're excited to introduce you to the latest contender in this ever-evolving landscape, one that truly delivers on its promises – DraftSight 2024. Let's take a moment to explore what this new arrival has in store.

SETTING THE STAGE

DraftSight 2024 raises the bar in CAD software, offering an array of innovative features and tools that elevate precision and efficiency. From various UI enhancements to workspace improvements, along with support for tool palettes and enhanced navigation and layer management, DraftSight's latest release establishes a user-centric environment. In addition, its superior capabilities in import and export operations bolster the overall performance.

DARK MODE AND ENHANCED WORKSPACE

DraftSight 2024 introduces a dark mode as its default UI style, providing a comfortable and visually pleasing environment, reducing eye strain for enhanced user focus. And the best part? You can switch to light mode whenever you please, keeping your CAD experience highly customizable. If you are a fan of personalizing your drafting experience, you will really benefit from DraftSight 2024's new workspace – CAD General. This addition can be accessed in the combo box located at the top left corner, offering users an enhanced interface. Enlarged icons have been implemented to improve the visibility of key commands, ensuring familiarity for both new and existing users.

VIEW NAVIGATION MADE EASY

For 3D enthusiasts and users that just prefer to adjust their model views quickly, a new view navigator enables swift and effortless transitions between pre-set view orientations like standard, isometric, and more. And if that's not enough, you can create your own custom view orientations. This will be a real time saver for a lot of CAD users.

INCREASED EFFICIENCY WITH TOOL PALETTE CUSTOMIZATION

Diving deeper, the tool palettes in DraftSight 2024 are your ace in the hole for enhanced productivity. Users can simplify drawing creation and maintain consistency with easy access to frequently used

commands. Creating a new palette is as easy as dragging and dropping or importing and exporting pre-existing palettes created in other 2D CAD solutions. The enhanced capabilities empower you to customize settings such as layers, colors, line types, and LineWeight. This not only boosts efficiency when inserting entities but also simplifies access to the tool palette within the new CAD General workspace, ensuring a smoother workflow.

ADVANCED LAYER MANAGEMENT

The additional layer management capabilities in DraftSight 2024 will transform your CAD experience. DraftSight's latest release introduces the option to access the layers manager as a palette, streamlining task handling. Additionally, it offers the capability to merge multiple layers into a single layer, simplifying drawing organization and significantly saving user time. You're probably catching on to the recurrent theme here - efficient design!

REVOLUTIONARY IMPORT, EXPORT, AND LINKING CAPABILITIES

But wait, there's more. DraftSight 2024 is all about making your life easier. You can now import CATIA drawings directly and open them as DWG files without the need for any conversion. This feature eradicates the complexities often associated with file conversion, allowing CAD professionals to channel their focus solely on designing. And, DraftSight 2024 even lets you import multiple files simultaneously as external references (Xrefs), maintaining a reduced file size for smoother operations. If you manage tables and data in Excel, there's good news for you too. DraftSight 2024 introduces the Data Link manager so you can embed Excel files for real-time data accuracy and cross-file collaboration, ensuring that your information is always up-to-date and accurate.

EXPORT SHEET IMPROVEMENTS

With DraftSight 2024's Export Sheet feature, you can swiftly generate new drawings from existing files without compromising on detail. It allows you to export all visible entities from the active sheet viewports in the model space to a new drawing. This functionality enhances legibility and focuses on specific sections, areas, or views within your drawing. You can export scaled representations of model space, title blocks, and other annotative elements, including dimensions and notes.

RIBBON-BASED INTERFACE FOR MACOS

Mac users can now enjoy an upgraded experience with DraftSight 2024. In the previous Mac version, the interface was menu-based and had limited customization options. However, with the introduction of a Ribbon-based UI, macOS users gain access to a unified, optimized interface that aligns with the experience provided to our Windows users.

ENHANCEMENTS TO MAKE FLAT SNAPSHOT

DraftSight 2024 brings significant improvements to the Make Flat Snapshot command. Now, you can effortlessly link foreground and hidden lines to specific layers directly from the Flat Snapshot dialog. This not only enhances organization but also allows for quick visibility adjustments based on layer associations.

ADVANCED HATCH FUNCTIONALITY

The latest enhancements in DraftSight's hatch functionality offer users greater flexibility when reshaping hatches, all without the hassle of recreating them. This is achieved by breaking the associative link between the hatch and its original boundary, unlocking a range of grips surrounding the entire hatch. These grips empower users to execute various actions, including stretching, vertex insertion, and converting to arcs.

A NEW CHAPTER IN CAD DESIGN

The improvements in this release, aimed at simplifying its usability, ensure a significant leap forward in user experience.

READY TO DIVE IN?!

Explore short videos on each of the new tools on the DraftSight Features page, or you can watch the on-demand session of 'What's New in DraftSight 2024' for a more comprehensive features demo. But the best way to really dive into these new capabilities is to give them a try yourself.

Get started and explore the potential of DraftSight 2024 today! Try DraftSight for Free for 30 days.

Did you know? You can join DraftSight at **3D**EXPERIENCE World 2024, a premier event for three days of inspiration, learning, and networking.

by: Emily Vineyard

Revit Etiquette: Becoming a Model Citizen

It's safe to say that many of us felt the paradigm shift from Revit first arriving on the scene as a replacement drafting software to becoming more of a carefully crafted environment—an ecosystem in which the project is reliant on the delicate balance of disciplines, teams and individuals doing their part to make their slice of the Revit community the best it can be.

Like it or not, as with any community, there's a code of conduct that comes with being a part of the Revit community. While projects do have BIM execution plans that clearly outline responsibilities, deliverables and other kinds of workflows, there is no singular document that explains the unspoken etiquette required to successfully work within this unique type of collaborative environment. Based on personal lessons learned, the following represent my Top 4 Revit etiquette tips that can help you to become a "Model Citizen."

LOOK AFTER THY NEIGHBOR

Let's face it, Revit is hard. And while our college education helped us to attain a basic knowledge of this game-changing software, I've found that you truly don't know how to get the most out of Revit until you're well into your career. On top of that, every firm has their own flavor of modeling standards, tools, plug-ins, and such. That's why on-the-job training and coaching is essential to understanding and experiencing the trade secrets of "Reviting." If you know somebody is new to their career or new to your firm, be a good neighbor and help them out as much as possible on their Revit journey. Direct them to internal and external training resources, introduce them to a subject matter expert, or simply make yourself available and accessible for any questions they may have.

On the flip side, as members of an ever-evolving industry, we learn something new every day. Maybe it›s a purposeful endeavor to seek out answers for ourselves or our project team, or maybe it's more of a lessons-learned scenario. Either way, there are people who will benefit from your experiences with Revit. So, dust off your teaching skills and share your experiences! Have meetings, create presentations, speak at conferences, or write a delightfully upbeat blog post to name a few options.

DON'T BE A LITTER BUG

At some point, we've all come face to face with that dreaded "junky" model and know that it becomes impossible to work in without having to correct, move, hide or delete the remnants of someone else's sloppy work. We should all strive to not be "that guy" on a project team—the one who leaves a Hansel-and-Gretel-style bread-crumb trail that leads to that very unfortunate place where another team member has to clean up after them—or

the Revit outlaw who disregards standards and processes, turning the model into the wild, wild west with their unruly modeling.

We should all strive for tidy, consistent and organized model environments. And that responsibility starts and ends with you, dear Revit user! Stay in touch with the latest and greatest Revit best practices, workflows and tools that will ultimately help your team and your model be the best that it can be! You can easily stay on the straight and narrow by engaging with your project BIM manager.

JOIN THE NEIGHBORHOOD WATCH

If you see something, say something! If you come across a straggling detail line or a family stranded on the Island of Misfit Families out in Revit space, be a good neighbor and take care of it. If a problem keeps recurring, you should feel empowered to call attention to it. That said, nobody likes a tattletale. After all, this is a neighborhood watch, not a model militia. We need to recognize that, more often than not, the reason behind sloppy modeling is simply a lack of awareness, a misguided approach, or even outdated information.

If we approach these corrections from a place of guidance and genuine concern for not only the model but also for our fellow teammates, there is a much better chance of the corrections being made. Who knows, you might have just tapped into an unrealized passion for BIM management thus broadening their career prospects. And that's a big win-win for everyone!

ALL FOR ONE AND ONE FOR ALL

It's easy to open a model and approach your to-do list for the day in full-on focus-mode, with your head down and your blinders on. As you're working, however, there will most certainly come a time when you find yourself at a fork in the road and are forced to choose how you go about completing your assignment. One road is a shortcut to the finish line. But this shortcut means you leave the door open for reworks, blind spots, duplication of work or sloppiness. The other road, the one less traveled, isn't via a shortcut. In fact, it will take a little more time, attention and coordination, but in the end, that little bit of extra work produces an outcome that many members of your team will benefit from.

It should be obvious which path we should all choose, but unfortunately, that is not always the case. Ultimately, shortcuts and quick fixes benefit nobody, and almost always cause more problems down the line than they ever helped to solve originally.

So, when you find yourself at the next fork in the road and tempted to fake it until you make it with filled regions, override graphics or "hiding in view," choose the path that will help your team and not just you. They are very likely doing the same for you.

Emily Vineyard is a licensed Interior Designer at Gresham Smith which is a national architecture and engineering firm. She has practiced exclusively in the healthcare market for 6 years working with large national accounts like HCA and Cleveland Clinic. As she discovered a passion for model integrity and teaching, Emily made a transition into Gresham Smith's Practice Technology division where she has been working as a Model Manager for the past 2 years. Her project portfolio as a Model Manager consists of large scale and mega sized projects within the firm's healthcare, industrial, and aviation markets. In this role, she has been able to provide overall BIM strategy and management services to her teams, develops new tools and workflows that target specific project needs as well as leading her teams through software pilot programs. Coupled with her genuine passion for skills development and training, her experience as a project designer and team member allows her a unique perspective and understanding into the educational and experience gaps that the younger workforce is faced with.

by: Rina Sahay

Greetings, Gentle Readers! Indulge me with your forbearance - as The New Kid On The Block, I step into the so-very-hard-to-fill shoes of none other than our very own Shaun Bryant. I will attempt to continue in a similar vein - giving you some new information and some old, possibly a few laughs, with hopefully a lightbulb or two lighting up over your heads.

Let's get started with the love of my life (veteran attendees of the past three iterations of **The Superb Guide To Easy Revit** would be able to testify to how Hopelessly Devoted I am to it!) -pyRevit. This may be the millionth time you're hearing about the information that I shall trot out for your inspection, and for good reason. pyRevit has a bunch of neat **FREE** tools that do a lot of cool things to accelerate your Revit workflows and safeguard model health. More adventurous souls can even create Revit automation magic with Python scripts to write custom Revit addons and distribute them to their teams using a unified interface.

However I'm getting WAYY ahead of myself - let's keep to the spirit of the title of this write up and proceed to introductions.

GENTLE READER - PYREVIT. PYREVIT - GENTLE READER

Start by installing. The brainchild of the inimitable **Ehsan Iran-Nejad** (now in cahoots with the equally formidable **Jean Marc Couffin**) ***pyRevit lives on GitHub.***

https://github.com/eirannejad/pyRevit/releases

It's currently on **v4.8.13.23182** and compatible with **Revit 2024**. The installer that you download is an **EXE** file (and can be run to install even if you do not have installation privileges!). Download, and run it.

You will be presented with options - the **pyRevit Core Tools** are installed by default, *The other modules are Extensions and are totally optional to install - we will discuss them in a future edition.*

Some of my favorite Core Tools out of each toolbar group.

Working from left to right across the toolbar -

Spy >> Open Current Session Journal directly opens the journal file for troubleshooting.

Toggles >> Tab Coloring is a tool that I use all the time, especially when I'm working on multiple projects or families and get confused by far too many open tabs. You can set the colors you need by adjusting **Settings.**

Toggles >> Highlight 2D takes the active view to the **Temporary View Properties** mode and highlights all 2D elements.

Selection >> Pick allows you to *Window-select large numbers of elements* to quickly and easily pick either **Detail or Model elements.**

Selection >> Isolate temporarily isolates elements of a selected category. **Keyboard shortcut HR** will restore the hidden elements.

Analyse >> Get in place families *quickly ferrets out those pesky in-place families* that will bog down your model. Now you can convert them to loadable families as needed!

Modify >> Make Pattern is the user friendly and intuitive superstar of this group. You can sketch ANYTHING - and pyRevit will write it to a PAT file that can be archived for future use in a library. ***And did I forget to mention - FREE?***

3D >> Orient View To Face did you see the workarounds for this in this year's **Superb Guide To Easy Revit**? This beats them hollow!!

Sheets >> Pin All Viewports a one-stop shop to prevent views from wandering on the sheet.

Revision >> Create Revised Sheet Set for a specific revision.

Manage Keynotes Another FREE tool to aid you in creating, managing, and editing Keynotes.

Legends tools This group features tools that will ***copy Legends between Projects, convert Legends to Drafting Views and vice versa.*** What a lifesaver!

Schedules >> List Schedules on Sheets Need I say more?

Views >> Copy selected view templates to other open models Now you are spared the All-Or-Nothing approach of Transfer Project Standards!

Print Sheets You can print pdfs renamed per company standards in one fell swoop.

Preflight Checks checks the model, Revit links warnings, lists all Reference Planes, and lists all unsheeted Schedules. The best way to safeguard model health.

Team >> Who did that?

Family >> Family QuickCheck Scan for **corrupt families.** The next best way to safeguard model health.

Links >> List DWGs will scan for **Linked and Imported DWG** files. A great way to ensure that *there are no DWG imports in the model.*

Wipe tools this set of tools will

- **Wipe Model Components** (most importantly - will Remove All Imported Line Patterns - more model health magic!)
- **Wipe Unpurgeable Viewport Types** - remember what a pain this is?
- **Wipe BIM360 Collab Cache** - one less thing to worry about!

This is just scraping the surface of the capabilities of pyRevit. Next time we'll talk about pyRevit extensions. Until then - Keep Reviting!

Please let us know if you have some news to share with us for future issues. Likewise, if you are a featured product or news item user and would like to write a review, we want to know. Drop me a line at: rinasahay@gmail.com. We'd love to hear from you!

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