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The Official Publication of Autodesk User Group International
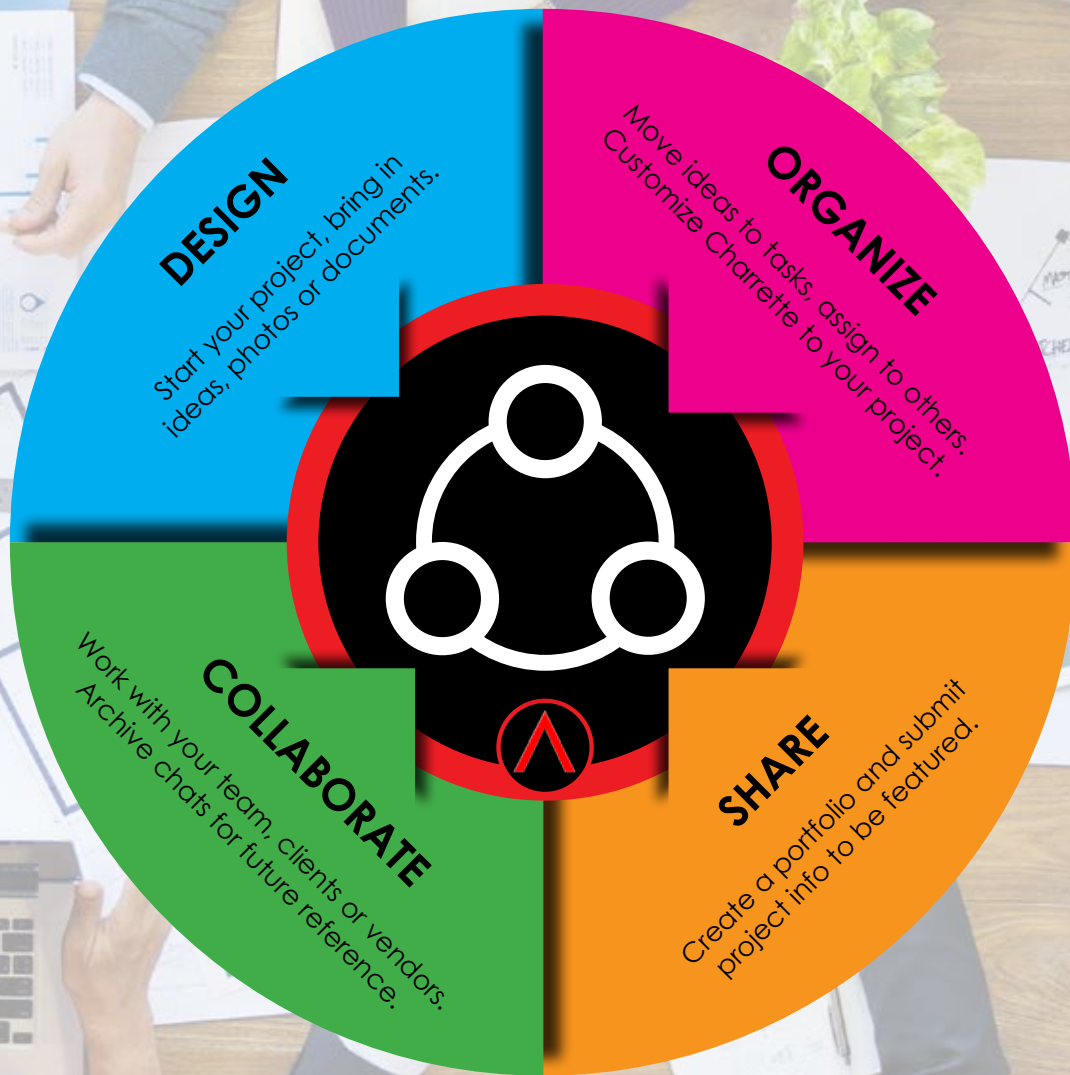
November 2017

Training:
Onsite, Offsite, Online, by the Book

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- **Exploring Display Themes in ACA**

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Letter from the President

"The only thing worse than training an employee and having them leave, is to not train them and have them stay." I think of this quote, attributed to motivational speaker Zig Ziglar, when I'm creating or updating a training program. Employee training can be a big investment, and fear of turnover can sometimes tempt us to put off that investment. But if you don't train people, and they stay, have you really gained anything? I don't think so.

Now that you've decided you need a training program, where do you start? Most of us aren't trained as educators, so the concept of "putting together a curriculum" might be a daunting one. Instead of trying to build a start-to-finish comprehensive program, I tend to put software training topics into two buckets. The first bucket is for "how the program works." This covers picks-and-clicks for the actual tools and features built into the software. The second bucket is "how we use the software." This bucket holds all your firm's best practices—which of the several ways to accomplish a task you've decided should be standard. Each bucket requires a different approach.

I like to delegate the contents of the first bucket as much as possible. There's little need for me to write picks-and-clicks training, mainly because there's so much of it out there already, and much of it is actually written by professional educators. When you consider the breadth of information available from publications, discussion forums, blogs, and conference archives, it's hard to justify spending your own time essentially reinventing the wheel. (And that list doesn't even include the built-in help files or services available from third-party training providers!)

But if you've been using Autodesk products for any length of time at all, you know that one of their characteristics is the many, many ways that are available for getting from point A to point B. Depending on the end goal, one way may be more appropriate than another—even if none of them are "right" or "wrong."

Let's say you have a Revit section that shows a steel beam connection. Do you: A) model the connection elements in 3D; B) use a detail component; C) use detail lines and filled regions; or D) any of the above, depending on the situation? As much as I would like the answer to be A (and we're getting closer to that all the time!), D is closer to reality. So I need training materials that explain the pros and cons of each option and guide the user to the best choice. I'm sure you can think of dozens of similar examples from your own work. And it's these topics that fall squarely in the second training bucket—the ones that aren't in the help files and that you can't delegate to an outside provider.

Before you can think about how to train people to follow your standards, you need to document what those standards are. (How to decide what the standards are is a topic for another letter.) Often that begins with writing down the desired end result. That gives you something to rely on for your own reference, and to show others when they question how things should be.

Once you know where you're going, you can decide how to get there. Depending on the situation, there may be One Right Way, or there may be multiple paths to success. At our firm, some things (model setup, for example) are prescribed—you must do it this way. At other times, the user must choose (you should see our decision matrix for how to create openings in floor slabs). Whichever way it goes, once you've written it down, you can tie it back to the picks-and-clicks training to teach people how to achieve the appropriate end result.

I've been writing this month about the "what" of training programs. (I'm pretty sure if you're reading this, you're already clear on the "why.") In a future letter, I'll write about "who" and "when"—my thoughts on how to schedule and follow through on training.

Kate Morrical
AUGI President

Revit Structure 2018

by: Joshua Geimecke

Make Training Priority One

I know how I made my entrance into the AEC industry, and it seems my story is similar to that of many others. I have a background in information technology and when I saw a need that automated drafting could help, I suggested to my employer that we buy a drafting program and a plotter. That was the start to my career.

On that job I learned the drafting program, which helped me land a job with a multi-discipline AE firm, where I took on the task of learning Autodesk® Revit® Structure. This aided in finding the next place of employment. At the new job, I learned another piece of software…

I think you can see where this is going. At each place I worked, I always looked to continue my education on the software that I already knew and also to learn any other software that would be beneficial to both the company and myself.

The main theme is that I was self-taught and that is where the commonality with my coworkers lines up.

Each situation at each company was different. At one place it was software that was never used in any other workflow, so no one knew about it. At another firm it was software they weren't sold on and not sure we would ever use outside of that project. Then there were other firms that just didn't want to put money into training, didn't budget for training, but still wanted you to use the software efficiently.

No matter how training is accomplished—whether you go outside your walls into a structured learning program, utilize in-house

subject matter experts, learn in a formal classroom setting or a "Lunch and Learn"—training is critical to staff performing well on their projects.

STANDARD ISSUE TRAINING

Training can be accomplished in many ways. Here, I'll discuss a couple of options that I have experienced in my career.

Offsite classroom training can be advantageous. The benefit of being away from the office to immerse yourself totally in the training can really pay off. You will get to learn hands-on, with an instructor, and be able to ask direct questions about issues you run across. The downside is the cost, which can be quite high. Many firms can't afford to have people out of the office for long periods of time.

Another downside is that if you don't go back and immediately use your knowledge you may forget some of it. I worked for a firm that did some training in Revit, but didn't use the software for over two years after the training. Needless to say, the training was forgotten and the software had dramatically changed within that period.

Another option is onsite, instructor-led training. This is a great way to tailor training to the specific needs of your firm and not take people away from the office. The downside is this can be pricey as well. In addition, being in the office can be a distraction for those being trained—we have all been in that training session where an emergency comes up and someone needs help.

I am a fan of the monthly, one-hour training style that can be led by a BIM manager or a subject matter expert in your office. Often these sessions can be topical, with questions coming from the other trainees. This can be very beneficial because these are problems that are actually occurring for the group. The downside is that it is hard to be hands-on during the instruction unless you have a computer lab. The upside is that the trainees usually can go back and immediately put into practice what was taught.

There are different ways to hold these, and one way is the Lunch and Learn. These sessions can work well, because who doesn't like food? Of course, you have to watch out for that one employee who shows up only for the free food!

Another avenue is industry conferences. Many of these may not dive as deep as other forms of training, but can cover a topic you are unfamiliar with or an area you just want to get more information on. When I was the only structural designer at my firm I really looked forward to the conferences so I could connect with other people in my discipline and discuss issues and successes they were having. I believe industry conferences are often not regarded as "training," but they definitely should be.

Even with all the training options available to us, sometimes nothing beats good old one-on-one interaction, which benefits both employee and trainer. Sometimes this interaction is all takes to make something "click" for a struggling employee. For the trainer, taking the time to work through it with that employee is always rewarding. Often, following these interactions, I walked away with an understanding of how to do something a little bit differently than how I had done it in the past. So, we always need to be learning!

WHERE DO WE FOCUS?

Companies have so many different software options to choose from and many incorporate various ones in their workflows, so where do you begin?

The best place to start is at the core of the software that your business uses to produce their deliverable. This is the product that brings your ideas to fruition and passes them on to the rest of the team. This seems simple and it truly is.

Once your company is rolling on the core software you can begin to train on the other programs that are used to support. Often that is done by explaining how the company uses the software and letting the employee dig in deeper, or again utilizing a subject matter expert with that software. Never try to take on all packages at the same time, because that is definitely a recipe for frustration and failure for those involved.

TRAINING NEW TALENT

Ah yes, the newbies—fresh out of school and ready to conquer the world! They are so eager and ready to roll, but then the actual job starts and they realize how much was missing from their formal education—not because the school couldn't handle it, but because schools don't have the time or resources to teach everything.

When you hire new talent that does not have experience in the AEC industry, training is going to be of the utmost importance to successfully incorporate the new hires into the jobs they have been hired to do.

First, they need to understand how the process works. Even with all the software your firm may have available, if the new hires don't know the process, the software won't do them much good. They need to have an understanding of how to begin their tasks, what is expected of them at what times with regard to deliverables, and what the final product should look like.

The new hires need to be aware of company standards and where that information is located. They need to have someone who can continually review their work so they don't pick up bad habits from the beginning. Once this basis has been set, the software part will make more sense.

Second is the software and how your firm uses it. I have worked at certain places, and months into my time there have learned they have specialized software or add-ons no one told me about that would have been especially helpful.

Revit Structure 2018

TRAINING SEASONED TALENT

Training the experienced person can sometimes be a delight. Other times, not so much.

Usually with seasoned talent you are going to have a variety of age groups and knowledge. I worked in one place that had employees who had gone through the change from hand drafting to AutoCAD® and I was charged with transitioning them from AutoCAD to Revit. Needless to say, some were not too happy about the prospect of transitioning once again.

I believe it is always good to have an open dialogue if you are going to be bringing in new software that is going to cause a drastic change in procedure. If you are able to keep everyone involved in the process, and they understand the benefits and the reason for the transition, you have conquered part of the battle. Although not everyone will get a say in the direction the business may take, their input is always valuable. They have an insight that the decision makers may not have.

You should always utilize the talent you have in the education of others. It is a very good time to take someone who excels in a certain area and let them take the reins on the training. This is where Lunch and Learn sessions work really well. Pick a topic and have someone prepare the entire presentation and do a hands-on in the software. It not only gives these employees a chance to give input and teach their peers, but also gives them experience in presenting.

EDUCATING THE CLIENT

This is a topic that often gets overlooked when it comes to a project. It is very easy to know all the buzzwords and the names of the latest software, but that doesn't mean that your client will know what they will be getting or even what they actually want.

Educating the client needs to be done at the onset of the project, and expectations should be covered in the contract. What the client is expecting as a deliverable and what you plan to provide need to be specifically spelled out and agreed to by all parties.

Too often you get to handoff a deliverable and half the team brings 2D drawings. You show up with your model and the client leaves disappointed. Another area that often results in client disappointment is as-built documentation. Will they get marked up drawings or will they receive an as-built model that is complete and shows what was installed?

WHAT WE DON'T ALWAYS THINK ABOUT

Per Wikipedia, the term constructability defines "the ease and efficiency with which structures can be built. The more constructible a structure is, the more economical it will be."

This is not taught in schools, perhaps not even discussed, unless you have a teacher who is predisposed to the topic. It isn't something that can be learned by sitting in a classroom or by reading a textbook.

To really understand constructability you need to be involved in some projects that are being constructed, at a cost to a client. Something that looks constructible on paper, in actual execution, may not be able to be built.

I worked at a company whose president was well received because he always took into consideration the constructability of a project. He would tell the client if something was impossible to build, or if something could be built, but at exponential cost. Or he would come with a redesign that would satisfy the intent of the original design.

He didn't learn this from a textbook, but rather through time and experience, talking to constructors, and being able to visualize the space where the issues existed. Constructability is a lesson that is taught by those with experience, and it's an important lesson to learn in any capacity.

IN CONCLUSION

Looking at the end of 2017 and into 2018 try to make your training needs a priority. Evaluate your company's needs, your inefficiencies, and where you excel. Then develop a training plan that will be beneficial to those already working and to new people that are brought on board.

Look at your projects and see what things could be done better and what is available on the market to meet those needs. Look at your management team for opportunities to explain why training is important and encourage them to budget for it. Explain to them the necessity of good training and what the end results will bring for the projects and the company as a whole.

Examine your clients' needs and what they are looking for in a deliverable and how best you can meet those expectations and give them the most useful information for their projects. Look forward to learning more and new things in the coming year, and then share the knowledge you receive.

Joshua Geimecke is a Principal Designer with the Fluor Corporation. He is currently undertaking constructability reviews for Standard Plant Designs . He has been involved in the drafting and design industry, working in many different disciplines and sectors for more than 17 years with the last 9 years focused on structural BIM.

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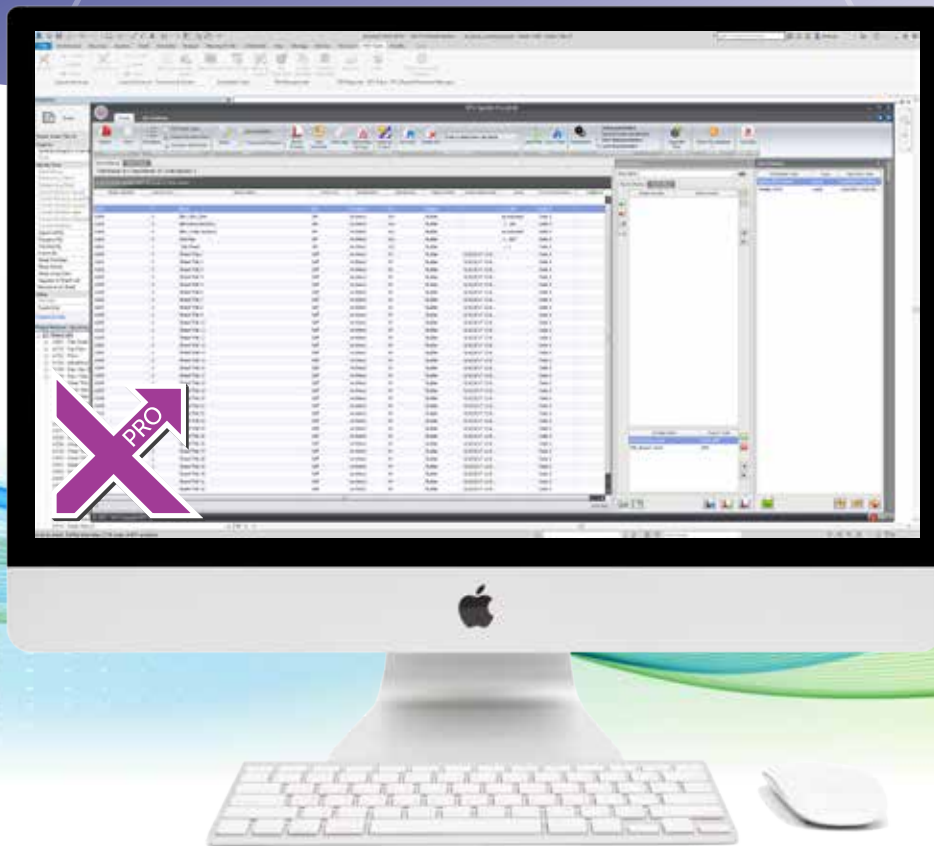
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by: Melinda Heavrin

PRODUCT FOCUS

Exploring Display Themes

Display Themes is a feature that will work with any ACA object you have created. Manual properties of an object—such as a wall's fire rating or a door's manufacturer—are not typically visible in a drawing.

Display themes lets you incorporate such non-graphic data in your drawing (both 2D and 3D) by using certain colors, fills, or hatches to highlight objects that meet the criteria or theme rules that you have established in a display theme style. For example, you could define a property named Function for room objects and then set up a theme rule that specifies that rooms with a Function value equal to "storage" will be displayed with a solid cyan fill.

A display theme can be activated in a drawing by using a display theme tool to insert a display theme legend, which explains the meaning of color, fills, or hatches specified in the theme.

CREATING DISPLAY THEMES

Display themes are an effective way to present information during the conceptual design phase of a project or when working with construction documents. With display themes you can identify changes to a project that are not in the contract, identify the staging of a project, and identify objects that meet or do not meet specific standards.

If you use the drawing as an external reference (xref) in a project, the display theme is imported into the host drawing by default. If the host drawing already contains a display theme, then the display theme in the host drawing overrides the display theme in the xref. A marker appears over the disabled display theme legend.

There is a simple five-step process that you can follow to create a display theme:

1. Create property data formats that you will use in your theme. The formats you create will determine how your data is displayed in the display theme legend.

2. Create property set definitions for objects in your drawing. Here you will incorporate formats from step 1.

3. Create a display theme style. This will specify the format for the legend of your display theme as well as what objects will be highlighted in your drawing. The legend is a key that will incorporate property set definitions from step 2. It will specify which visual indicator will be applied to which objects in a drawing and what the content will be.

4. Attach property set data to the objects for inclusion in your display theme.

5. Activate the display theme by adding the legend to the drawing.

Now, let's look at each of these steps in a little more detail.

PROPERTY DATA FORMATS

The criteria for the display theme are based on the property data attached to the objects or object styles. The property data overrides the display properties to produce the visual effects produced by inserting a display theme. Property data formats are created and edited in the Style Manager under the Manage tab of the ribbon, Style & Display panel. You can also enter the command AECSTYLEMANAGER. To create a new one, expand Documentation Objects, right-click Property Data Formats, and click New. Enter a name for the new format and click Enter. If you wish, you can also select an existing Property Data Format, right-click and copy, then paste and rename.

Now you will click on the Formatting tab (see Figure 1). Here, you need to specify how you want the formatting to appear. For example, if you want text to appear in all capital letters, you would select Upper under the Case drop down. Fill in all information pertinent to the format you are creating. Click Apply and then OK when you are finished.

PROPERTY SET DEFINITIONS

Property set definitions are created and edited in the Style Manager under the Manage tab of the ribbon, Style & Display panel. You can also enter the command AECSTYLEMANAGER. To create a new one, expand Documentation Objects, right-click Property Set Definitions, and click New. Enter a name for the new definition and click Enter. If you wish, you can also select an existing Property Set Definition, right-click and copy, then paste and rename.
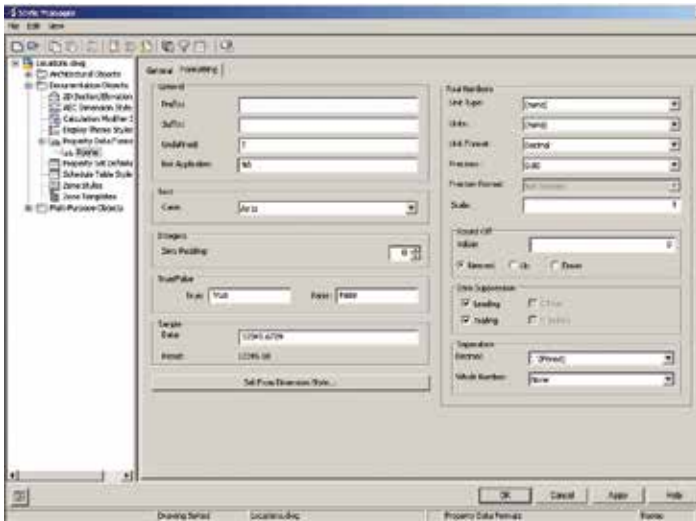
Figure 1: Property data format

Figure 3: Automatic property definition

Select the Applies To tab and check the box next to each Object or Style and Definition to which this Property Set Definition will apply. Now you will want to click on the Definition tab (see Figure 2) and add Property definitions as needed. Using the buttons along the right side of the dialog box, you can choose to add manual definitions, formula definitions, automatic definitions, etc.

The Automatic Property Definitions button is unique in that it brings up a dialog box of preset definitions from which to choose. The values for each of these properties are obtained directly from an object or its style. The properties available to select is dependent upon objects or styles selected on the Applies To tab (see Figure 3).

DISPLAY THEME STYLES

Display theme styles control the visual change to the objects as well as the content and appearance of the display theme legend in the drawing. A drawing must contain a display theme style to affect the visual changes or to add a display theme legend. When you copy a display theme style into a drawing, property set definitions and data formats specified in the style are also copied. Display theme styles are created and edited in the Style Manager under the Manage tab of the ribbon,
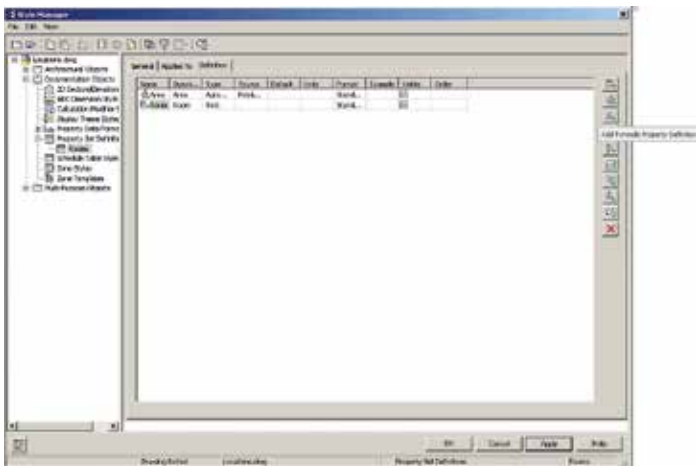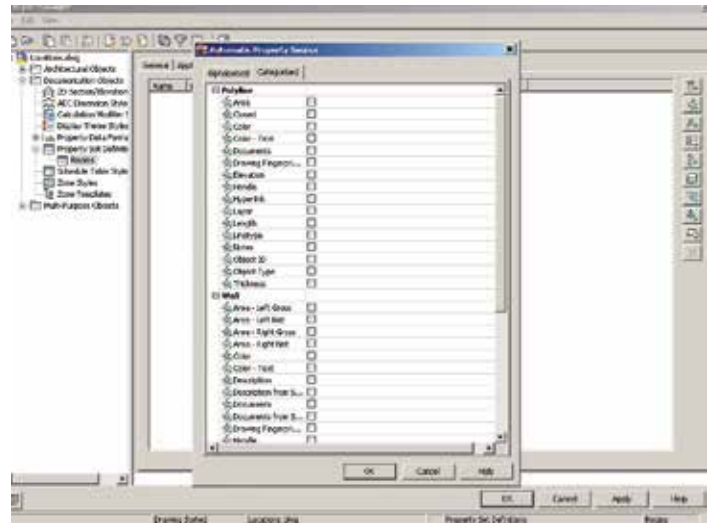

Figure 2: Property set definition

Style & Display panel. You can also enter the command AECSTYLEMANAGER. To create a new style, expand Documentation Objects, right-click Display Theme Styles, and click New. Enter a name for the new definition and click Enter. Enter a description for the Display Theme Style. If you wish, you can also select an existing Display Theme Style, right-click and copy, then paste and rename.

Next, click on the Design Rules tab (see Figure 4) and click the Add Component button on the right side of the dialog box to create a new theme setting. This will create an unnamed theme setting with an index number of one. Now you can create the settings for the display theme, which will control the type of highlighting in the style.

Next, you can create theme rules for each theme setting, which will determine specifically which objects will be highlighted using each setting. When you create a theme rule, you will see an index number that corresponds with the theme setting. If you wish, you can create multiple rules for each theme setting. For each theme rule you create, you can select a property set definition, a property that is contingent upon the property set definition you selected, and a condition that is contingent upon the property set definition and property you selected. Then you will enter a value appropriate to the condition you selected and select an operator appropriate to the formula you are creating for the theme rules.

Next, you will specify the format for the design theme legend by clicking on the Legend Format tab. Enter the information that is pertinent to your style.

Last, you will specify the display properties for the display theme legend by clicking on the Legend Display Properties tab. You will then select the display representation on which to display the changes and select the Style Override. The display representation in bold is the current display representation. Click the Layer/Color/Linetype tab, select the component to change, if any, and select a different setting for the property. Once everything is finished, click OK twice.

Once your display theme style is created, you can drag and drop it onto the tool palette for future use. Doing this creates a display theme tool.

AutoCAD Architecture 2018

Once it is placed on the tool palette, you can right-click on it and click on properties to add a description, change the scale of the legend, and so on.
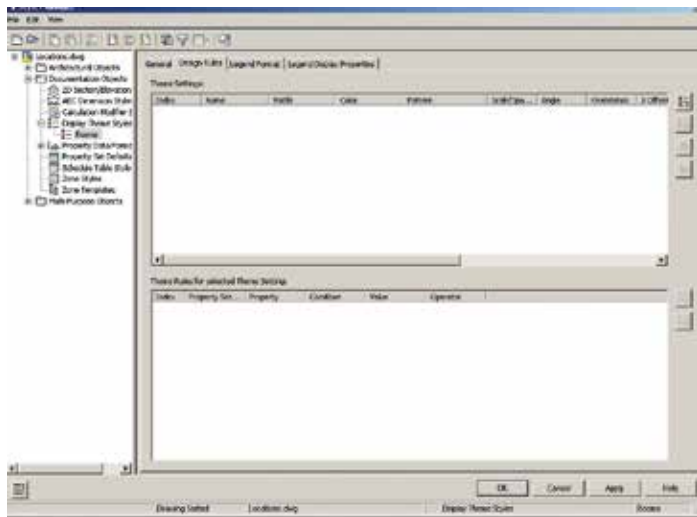

Figure 4: Display Theme Style Design Rules tab

ATTACH PROPERTY SET DATA

Now that you have created everything you need for your display theme, you will need to attach property set data to objects in your drawing. Select the objects to which you will be attaching property set data, right-click and select Properties. On the Properties Palette, click the Extended Data tab (see Figure 5). Next, click the button at the bottom of the palette to add property sets. Select the property sets to attach to the object and click OK.

The property set is now attached. You will find that the values for automatic properties are already filled in. At this point, you can enter data for manual properties for each object.

It is important to note that if you select more than one type of object, you can attach only the property set definitions that apply to all the selected objects. For example, if you select doors and windows, you can attach only those property sets that apply to both doors and windows.

DISPLAY THEME LEGEND

A display theme legend provides a key to the display theme, mapping specific colors, fills, or hatches to properties of objects in a drawing. You insert a display theme legend into a drawing to activate a display theme and visually change the appearance of objects by overriding the current display properties.

The tools provided let you quickly place display theme legends by selecting a display theme tool with a specific display theme style and other predefined properties. When you place display theme legends using display theme tools, you can use the default settings of the tool or you can change settings for the display theme properties. You can also use display theme tools to apply the settings of a display theme tool to existing display themes.

The default Scheduling palette in the tool palette set contains three sample display theme tools you can use and customize as needed. Custom palettes created by your CAD manager or other users may also contain display theme tools with display theme styles and properties that are customized for your projects or office standards.

ACTIVATE DISPLAY THEME

The display theme legend activates the display theme in the viewport and identifies the meaning of the different colors, fills, or hatches used in the theme. The data for the display theme legend is collected from the property set

Figure 5: Properties extended data

data attached to the objects or object styles, as specified in the display theme style. When you add new objects to a drawing, data is added to the legend if it meets the criteria you specified in the display theme style.

At this point, you are ready to add the theme you created into your drawing. The display theme is added to the drawing through either the scheduling tool palette or the command DisplayThemeAdd.

Open the tool palette that contains the display theme tool you want to use and select the tool. In the drawing area, specify the insertion point for the upper-left corner of the display theme legend. Then specify the lower-right corner of the legend or press Enter to scale the display theme legend to the current drawing scale. The display theme is now activated. At this point, you will notice that the objects affected by the display theme visually change in the drawing as indicated by the legend.

You can add more than one display theme to your drawing; however, only one theme at a time can be active. If you add a display theme to a drawing and there is already a display theme there, the older one will automatically be disabled when you add the new one. If new data is added to your drawing that meets the criteria of your display theme style, it will be added to the legend.

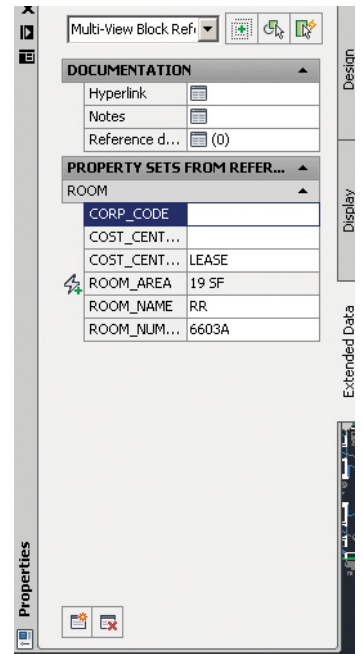*Melinda Heavrin is a CAD Coordinator & Facility Planner for Norton Healthcare in Louisville, Kentucky. She has been using AutoCAD Architecture since release 2000. Melinda can be reached for comments and questions at melinda.heavrin@nortonhealthcare.org.*
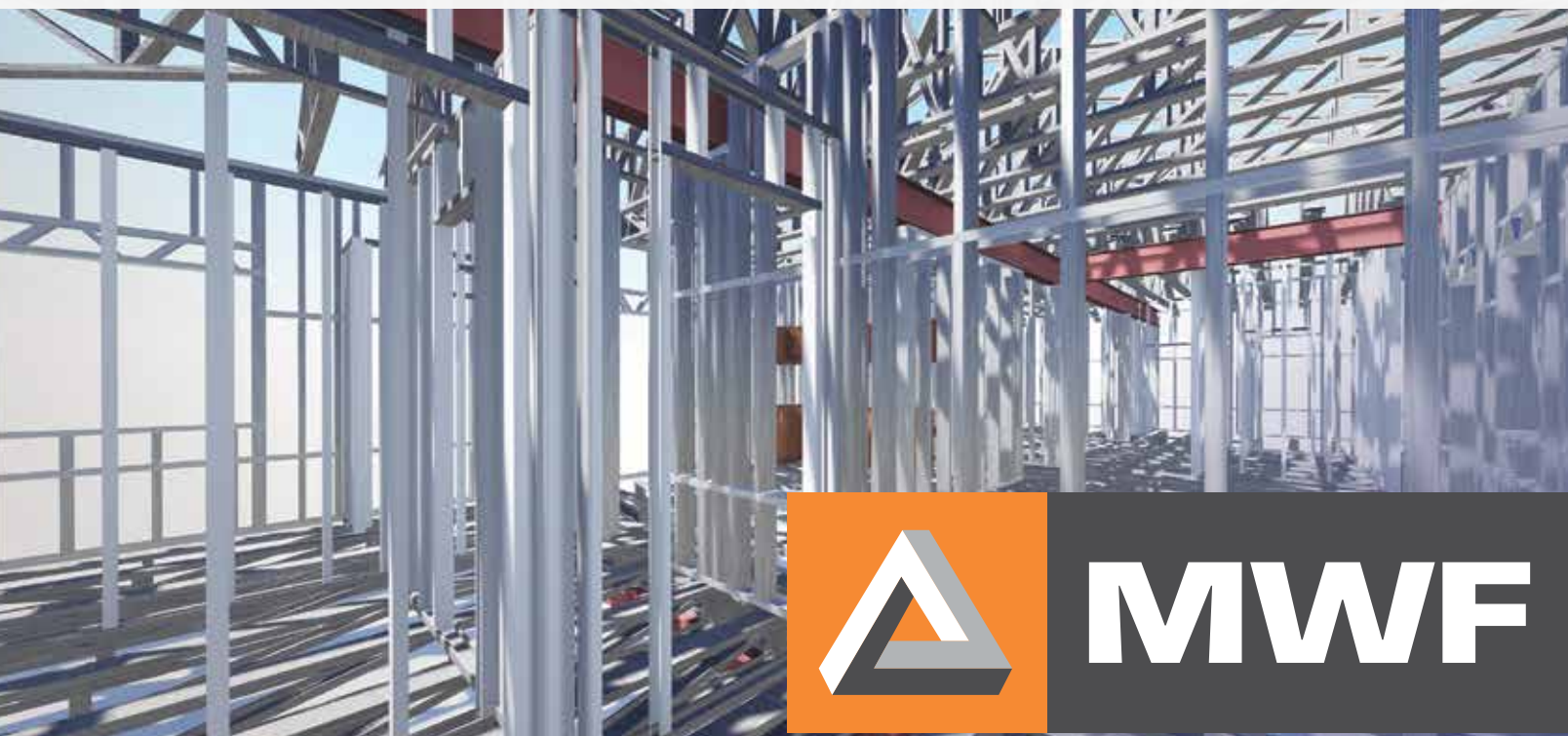
by Robert Green

Updated Intel® Xeon® Processors Power New HP Z4, Z6 and Z8 Workstations

There's an old saying that less is more but where workstations are concerned we Autodesk users always want more and more, which aptly describes the updated performance of the recently introduced HP Z4[1], Z6 and Z8 desktop workstations. Embracing the more is more than philosophy—these workstations bring powerful new processors, faster RAM, more storage and more bandwidth to your desktop.

Designed to power thru aggressive CAD, analytical and video workflows that Autodesk users increasingly deal with, the new HP Z4, Z6 and Z8 tower workstations make use of the latest Intel® technology[2] with HP's traditional reliability and design to deliver truly high-end desktop performance.

SLEEK DESIGN INSIDE AND OUT

HP Workstations are built to deliver great computing performance (more on that shortly) but in this generation of HP Z Workstations additional internal design considerations have been taken into account that aren't as obvious as the clean tower enclosure designs.

The new HP Z Workstations employ tool free chassis designs with integrated handles and strategically placed vents with internal air baffles to provide maximum airflow at minimal fan speeds so they are both easy to deploy and ultra-quiet. And inside the enclosure all new workstations include a new self-healing BIOS that incorporates intrusion detection technology to provide unmatched workstation security[3].

COMMON FEATURES

While the HP Z4, Z6 and Z8 Workstations have varying expansion capabilities, they share some common characteristics that can be broken down into the various workstation subsystems as follows:

New Intel® Xeon® Processors: Any workstation is only as good as its processors and the new HP Z desktop workstations bring the latest Intel® Xeon® Processor technology to bear. Offering select processors from the Intel® Xeon® W21xx series on the HP Z4 up through the Intel® Xeon® Platinum 81xx series processors on the dual processor capable HP Z6 and Z8 anywhere from 4 (single processor) to 56 cores (dual processors) can be configured[4].

The range of processor options not only spans a wide range of available cores but also a spectrum of base frequencies and Turbo Boost speeds depending on workflow needs. The HP Z4 single processor machine offers base frequencies from 3.3 GHz (10 cores) to 4 GHz (4 cores) with Turbo Boost speeds up to 4.5 GHz. The dual processor capable HP Z6 and Z8 Workstations stress more available cores to address multithreaded workloads like analysis and video editing ranging from 2.5 GHz 28 core processors thru 3.4 GHz 6 core versions with up to 3.8 GHz Turbo Boost speeds.

Memory: To feed the updated Intel® Xeon® Processors data at the highest rates, memory speed has been upped in the new HP Z Workstation family. Utilizing 2666 MT/s DDR4 Error Correcting Code (ECC) SDRAM (up from 2400 MT/s in prior generation Z models) the new HP Z Workstations offer large memory capabilities from 256 GB (via 8 memory modules) on the Z4 to a staggering 3 TB (via 24 memory modules) on the Z6. Simply put, there is ample room for adequate memory on all the new HP Z Workstations.

HP Turbo Drive Solid State Discs: Of course all the processing power and RAM in the world can't do much if it is waiting on a mechanical hard drive to load and save data. HP Turbo Drives deliver up to 4x better performance than conventional SSD's and 14x better throughput than conventional hard drives. Utilizing

NVMe technology HP Turbo Drives can be installed in sockets on the motherboard (for 250 to 500 GB[5] models) or in PCIe expansion boards (holding 1 TB models) for as much as 4 TB of SSD storage depending on workstation model and available expansion slots.

High Bandwidth Connectivity: Designed to accommodate two ports of lightning-quick 10 GbE network connections[6] the new HP Z Workstations can move large data sets through corporate networks at much faster rates while integrated Thunderbolt™3 technology connections allow for fast data transfers to external devices.

Graphics: With visualization becoming ever more important in Autodesk software workflows certified graphics are a critical consideration. Supporting a wide range of options from a single 2 GB NVIDIA® Quadro® P400 entry level 3D processor up through multiple 24 GB NVIDIA® Quadro® P6000 ultra high-end 3D processors the new HP Z Workstations have the expansion slots and available power supplies to support the most aggressive graphical requirements.

WORKSTATION MODEL SPECIFICS

Given the common technology advances shared by the HP Z4, Z6 and Z8 Workstations let's now focus on what makes each of the workstations different:

HP Z4: Single processor architecture supporting up to 10 core Intel® Xeon® W processors and 256 GB of RAM makes this workstation a solid choice for CAD focused tasks that respond best to high clock frequencies and ample RAM. A slightly larger case than the Z4 with up to a 90% efficient 1000 W power supply and 5 PCIe expansion slots allow up to 4 TB of PCIe based solid state disk and a variety of graphics processors along with two internal drive bays for conventional disk storage.

HP Z6: Single or dual processor architecture supporting up to 28 core Intel® Xeon® Platinum processors and 384 GB of RAM makes this workstation a solid choice for CAD or multithreaded applications like analysis or rendering focused tasks that respond best to high clock frequencies and ample RAM. Medium tower case with up to a 90% efficient 1000 W power supply and 6 PCIe and 2 M.2 expansion slots allow up to 4 TB of PCIe based solid state disk and a variety of graphics processors along with two internal drive bays for conventional disk storage.

HP Z8: No compromises single or dual processor architecture supporting up to 28 core Intel® Xeon® Platinum processors and 3 TB of RAM makes this our most powerful workstation on the market for the most complex Autodesk workflows running simultaneously. Full tower case with up to a 90% efficient 1700 W power supply and 9 PCIe expansion slots allow up to 4 TB of PCIe based solid state disk and a variety of graphics processors along with four internal drive bays for conventional disk storage.

WHEN PERFORMANCE AND RELIABILITY MATTERS

While all the new HP Z Workstations bring great performance and configurability to Autodesk users they also bring the reliability, warranty and superior design that HP has always been known for. If your company needs to specify new workstations for your Autodesk Software usage the new HP Z4, Z6 and Z8 Workstations certainly merit consideration.

ABOUT HP

HP helps you stay ahead of the curve with professional desktop and mobile workstations designed for large and complex datasets, dispersed teams, and tight deadlines. HP Z Workstations deliver the innovation, high performance, expandability, and extreme reliability you need to deliver your 3D CAD projects in less time. To learn how to configure a HP Z Workstation, visit the HP and Autodesk page at www.hp.com/go/autodesk.

ABOUT ROBERT GREEN

Robert Green provides CAD management consulting, programming, speaking, and training services for clients throughout the United States, Canada, and Europe. A mechanical engineer by training and alpha CAD user by choice, Robert is also well known for his insightful articles and book, Expert CAD Management: The Complete Guide. Reach Robert at rgreen@greenconsulting.com

BIM 360

by: Anthony A. Hauck

Mining the Cloud for a Better Building Industry
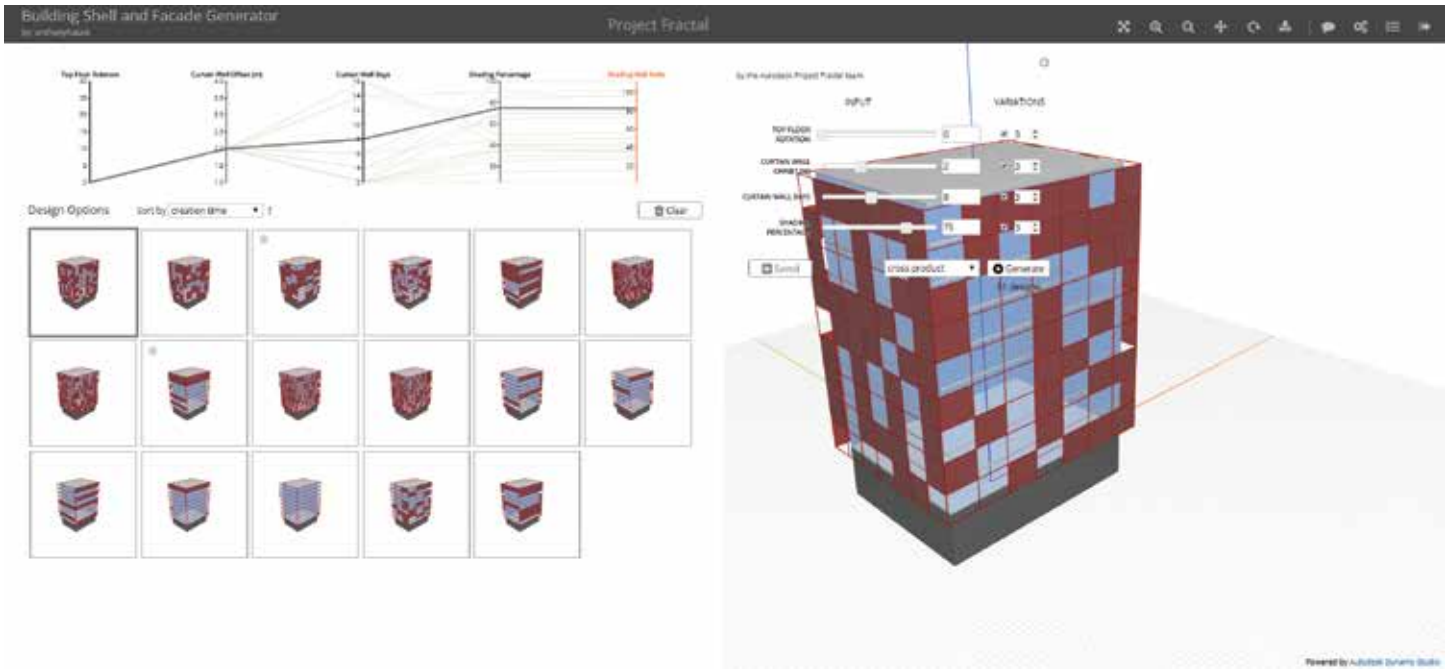
Project Fractal automates the generation of thousands of design options by driving input changes through uploaded Autodesk Dynamo Studio graphs.

By attending several conferences this year I've had the opportunity to hear some of the most advanced thinking around the intersection of computation and architecture, engineering, construction, and operations. Around the world I've consistently heard declarations that it isn't the model that's important, it's the project data, as though the building and infrastructure industries have undergone a profound change. In response, I always ask, "When wasn't the data important?"

The Great Pyramid of Egypt deviates from an exactly square base by 0.07%. I would argue that this level of precision, with what we would consider primitive tools, arises from a concentration on the importance of data when making decisions about buildings and infrastructure. Other examples from the ancient world include the accuracy of celestial observation implicit in the layout of Stonehenge and Roman Empire aqueducts that serve Rome effectively to this day. None of the outcomes served in these examples would be possible without a concentration on critical data at the center of the project, be it celestial mechanics or gravity hydraulics.

So, if data has always been at the center of the built environment, why the current rhetorical focus on the idea of data centricity in multiple presentations, keynote addresses, and classes at events in every major region of the world? I believe the thought being

conveyed in every one of these venues is the realization that supporting technology has progressed past the point where we need to wholly concentrate on producing conventional instruments of service, as consumptive of time as that activity remains. As a class of professions concentrating on the built environment, we have an opportunity to leverage and repurpose the data those instruments have explicitly and implicitly recorded in the design and project delivery process.

Again, this was always the case. Those responsible for managing and maintaining facilities have employed design and construction drawings of various degrees of accuracy for centuries, and yet there is an intuitive sense observable in the AECO industries that something has changed. That change is not merely the increased accessibility of data implicitly recorded for creating instruments of service, but also the increasing capability in the industry to automate the production and delivery of information formerly consigned to human labor.

CAD programs provided some automation of drafting tasks, but no explicit support for producing better outcomes for a project. BIM has helped the industry progress farther, at first supporting a degree of understanding of a proposed building's behavior through accurate visual renderings. Step by step, as the data implicitly recorded in models has been leveraged into additional analyses and

simulations, we have begun to derive meaning from what were formerly highly abstracted representations of the built environment encoded in ways accessible only to those with specialized training. What we are beginning to see is not only the democratization of information, but of intent.

However defined and prioritized, effective outcomes have always been the intent of every building project, but the industry has lacked the readily available means to consistently and accurately deliver on the intent of its projects, as opposed to the mere physical instantiation that may or may not serve the project's goals. Due to the increasing use of scalable cloud computing, wide availability of relevant data, and worldwide connectivity between professionals, the AECO industries now have a unique opportunity to move beyond instruments of service, and even physical artifacts, to universally serve the intent of projects through these means.

Up to the present day, the impediments to consistently and accurately serving the constituent needs of building projects have been myriad and nearly insurmountable. The shortage of relevant expertise, delivered only through the direct consultation of too few highly experienced professionals, has too often resulted in suboptimal outcomes in which the goals of a project have been only partially served or entirely obscured in the completed project. As a group of building professions, we have attempted to address such problems through specialization in specific building types and building systems, and we hope that the most experienced people we place in critical project positions will be in the right place at the right time to ensure proper service to the project's intent.

Hope, unfortunately, is not a plan.

While such an approach is anecdotally effective, as evidenced by many successful projects, the outcomes for the building industries remain dismal. It need hardly be enumerated that the AEC industry's cost overruns, missed schedules, and suboptimal results are endemic and nearly universally challenging on almost every project. It is commonly understood and still widely tolerated as inescapable that 25 to 50 percent of all labor and materials on every project will be wasted, the type of process issue that has long ago been optimized out of existence in the manufacturing industry. Simply put, manufacturers who could not equal or surpass the efficiencies and quality controls of their competitors went out of business long ago.

Digital cloud technologies now afford the AECO industries an opportunity to become both more consistently efficient, and more importantly, more consistently effective on every project, regardless of the assigned professionals. Building expertise has traditionally been difficult to acquire, maintain, and extend. Professional licensing requirements in most jurisdictions include continuing education, but the intersection of such fulfillments with timely project needs is chancy at best. Likewise, expertise conveyed through conferences may or may not arrive at the right moment to increase project quality or deliverable productivity. Expert consultation is likewise subject to uncertain availability and outright shortages on projects.

The only consistently reliable way to deliver relevant data and expertise is through software environments capable of supporting AECO needs, either by connecting professionals to relevant information or directly encoding the expertise in the form of analytical, simulation, computation, data management, and machine learning services.

**HIGH SCORING
id: 8_16**
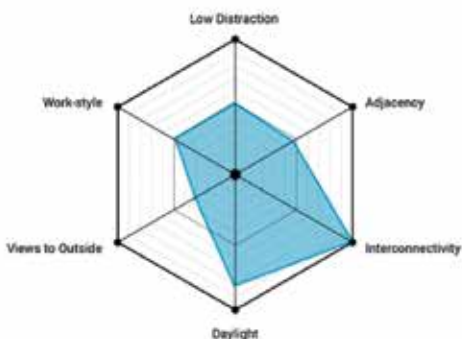
OVERALL SCORE:6.2

DAYLIGHT :	8.0
LOW DISTRACTION :	5.2
ADJACENCY :	4.9
VIEWS TO OUTSIDE :	3.1
INTERCONNECTIVITY :	9.9
WORK-STYLE :	-
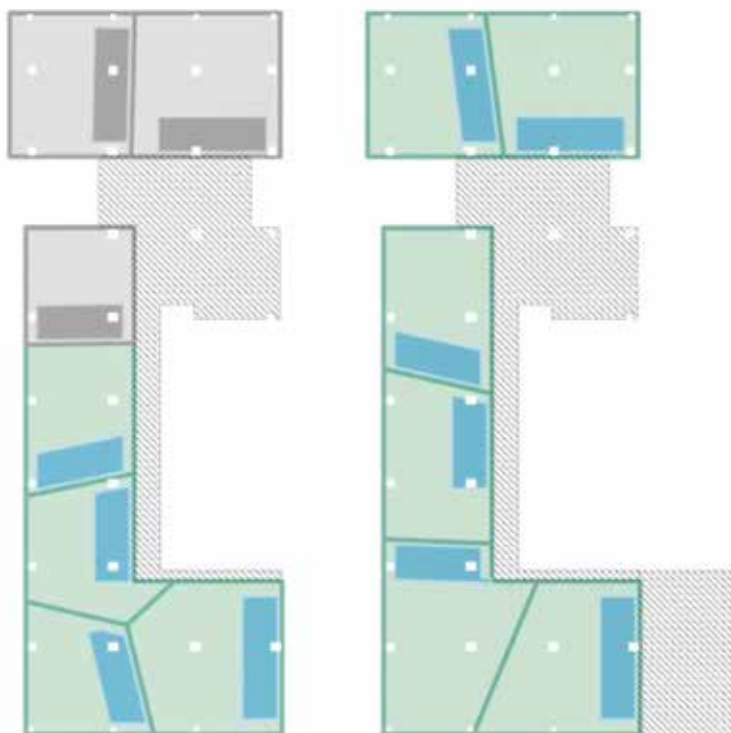
Project Discover used scalable computation and genetic algorithm optimization techniques to generate and evaluate thousands of options for Autodesk's new Toronto office.

Delivering such capabilities in the past faced limitations of computation and memory access inherent in desktop environments. By incremental steps leveraging scalable cloud computation and data orchestration—from realistic cloud rendering through energy analysis to BIM collaboration technologies—Autodesk has sought to increase the timely application of relevant expertise to building problems by leveraging the cloud.

Regardless of the services on offer, cloud technologies provide two fundamental advantages: connectivity and scalable computation. These basic capabilities can be shaped and applied in thousands of ways to support individual workflows. Where Autodesk's portfolio has encompassed a vast array of needs in the AECO industry, the availability of API access to product features was always an implicit recognition that no commercial software developer can anticipate every need and use of their products, especially in industries responsible for more than $7 trillion of economic activity annually worldwide.

As Autodesk transitions and creates new capabilities in the cloud, we're looking to leverage existing technologies in more granular ways, exposing valuable capabilities as cloud services that can be orchestrated by partners and customers for unique needs unsupported by initial commercial offerings.

Several current services on Autodesk Forge, our cloud development platform, started life as technologies necessary to support BIM 360 capabilities. As we expand our commitment to the opportunities afforded by the cloud's connectivity and scalable computation, we'll be looking to open new services to wide use, not just by partner developers, but directly by building professionals.

Several current development investments at Autodesk illustrate the strategy.

Project Fractal, available for experimentation today, uses scalable cloud computation to produce thousands of options by driving an uploaded Autodesk Dynamo Studio graph, extending a desktop visual programming environment with a service aiding the exploration of captured project intent.

Project Discover, employed in the design of Autodesk's new Toronto office, uses scalable algorithmic optimization to generate thousands of options balancing multiple project goals. Project Quantum is designed as an ecosystem of desktop and web software environments, cloud services, and data repositories that capture and inform project expertise by supporting arbitrary connectivity between multiple capabilities in orchestrated workflows.

BIM 360 Insight, currently in development in conjunction with six major construction companies, applies machine learning to thousands of their collective recorded BIM 360 issues to alert their project managers of elevated risk to current projects, with the system becoming more accurate and nuanced the more it's used.

None of these capabilities could be fully realized without employing the connectivity and scalable computation of the cloud, and all of them begin to address the application of specific recorded and automated expertise to building problems to help raise the quality of the resulting built environment. As automation gains ground in industry after industry, raising productivity, reducing risk, and increasing quality, a pervasive concern in many quarters is the future value of professional contribution.
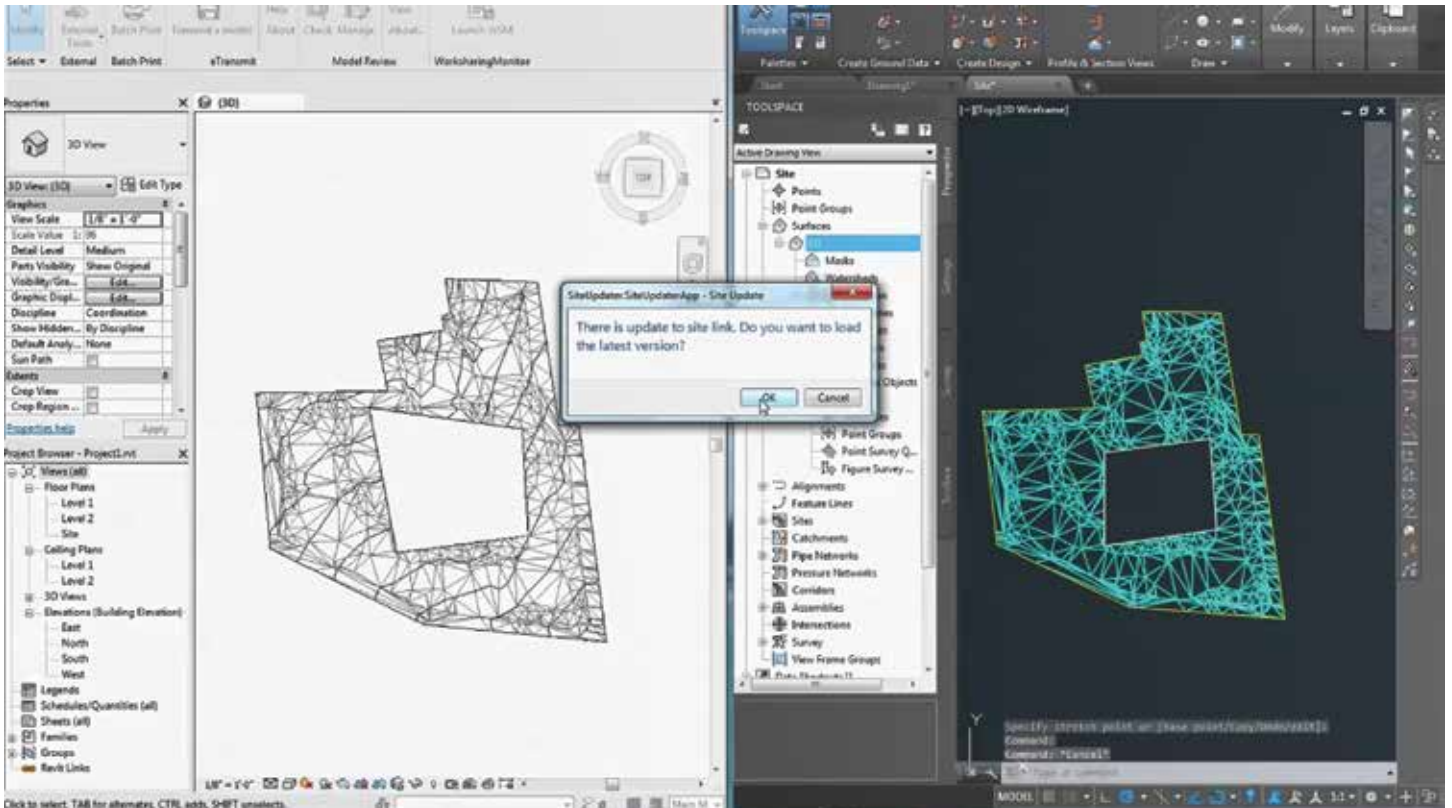
In this prototype, project Quantum keeps Autodesk Revit and Autodesk Civil 3D topography synchronized between platforms.

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MTower™ 2P64X & Render™-RT

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"On the SOLIDWORKS®test, the Xi®PowerGo XT was the clear winner, surpassing every other mobile workstation we have ever tested"-DE-11/16. Xi PowerGo 15/7 with NVIDIA®**Quadro P3000** is **237% faster than the Dell® Precision 5510** as tested by jonpeddie.com review of 8/17.

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PRODUCT FOCUS

BIM 360 Insight uses machine learning in the cloud to find patterns in thousands of issues recorded by participating construction companies, using past data to predict current risks.

To my mind, the concerns are misplaced. Merely framing a building problem for an automated approach is a human endeavor requiring considerable thoughtful investment and client discussion. Selecting the proper data and services to apply to a defined problem is itself a creative endeavor. Prioritizing conflicting project goals can only be performed by professionals advising their clients. No machine is going to be able tell us what's important, what critical values we must serve, but by the careful application of the new capabilities the cloud affords, machines may be able to help us explore and understand the full consequences of our building and infrastructure design and construction choices, allowing us the luxury of informed and confident decisions that pursue prioritized intent on every project.

Supporting the scalable cloud automation of building, infrastructure, and manufacturing design, fabrication, and construction isn't merely a good idea, it's a necessity. By 2050 our planet will be inhabited by 10 billion people who will need 14 million new buildings and attendant infrastructure just to maintain the world's current wildly unequal standard of living. As building professionals, we should aspire to far more than maintaining the inadequate status quo. Digital technologies have finally reached a threshold where they can offer more than the flawless repeated execution of precisely crafted commands.

As partners in our professional endeavors, software environments supported by cloud technologies that can deliver the right building expertise to the right people at the right time will transform the AECO industries, dependably raising the level of practice worldwide and allowing us to be more effective in delivering on project intent because we'll have at our disposal the collective expertise of our industries. Just as Google helps us find anything, and Amazon helps us buy anything, we're hoping that Autodesk can help make anything. Better.

Anthony Hauck has been involved in architecture, engineering, construction, and technology for more than 30 years. As an architect, millwork project manager, software developer, and IT Director, he has always looked to technology to help solve issues facing the building industry. He joined the Autodesk Revit team in 2007, holding a succession of product management positions in the group until joining Autodesk AEC Generative Design in 2015 as its Director of Product Strategy, where he is responsible for helping define the next generation of building software products and services for the AEC industry.

The Education Triumvirate

If you're like me, you may find it challenging to balance the information we have available regarding 3ds Max® (and design in general) and prioritize so we can effectively implement it. I wish I could take the blue pill, plug in the wire, then be good to go. Unfortunately, I can't. However, I found three factors have influenced me most when learning software such as 3ds Max and accomplishing my goals as effectively as I can.

Figure 1

In Figure 1 are the three factors: contacts, forums, and videos and/or books. Each of those includes a circle where they meet in the center of the triangle. I'll call this the sweet spot. This is the spot where we aren't ignoring too much of one available resource in favor of another.

There's a reason for this balance. First, people with information we need don't always find it convenient to offer it in every format that suits us best. Second, while we might not find a resource exciting, the information available could lead to advances we might wish to be part of, or solutions to challenges we face. For example, the commercialization of VR technologies grew in the last few years, but if you were to visit Google's Scholar site and look up information concerning VR technology you'll find people have been preparing for this for more than a decade while presenting their theories of implementation in their research and studies. Having been aware of this, some have positioned themselves to take the most advantage of it.

By staying close to the sweet spot, we can control the amount of information we absorb so it's not too overwhelming for us or others. For example, if we find that spot slides too far toward the forums section, we are focusing too much on one element and limiting the amount of information we could obtain from others. Or if we are burdening our contacts too much, we can shift and rely on forums or videos. The key is to remain sensitive to how we are spending our time and using the resources available to us.

Now favoring a resource is fine—it helps to prioritize when we have limited time or when other methods prove to be more difficult for obtaining the information we need. If you refer to Figure 1 you'll see on the left I've placed contacts on the top of my triangle. This means that when I try to learn something or face a challenge I need help with, I'll lean toward contacts first. Alternately, if I find a forum to be more helpful than contacts, I'll shift its priority to the top of my triangle.

The trick to advancement is to not lean too much on any one element. If we do, we become co-dependent and if that resource becomes impractical (such as forums become too expensive to par-

ticipate in, or our contact changes disciplines, passes on, or moves) it leaves us with few options to move forward.

Although it takes a lot of hard work, time, and sometimes cash to develop a structurally sound triangle that will last, it is never too late to get started.

CONTACTS

It's important to broaden our perspective by engaging with others outside our typical environments. You might think resources are limited in this area, but they aren't. Autodesk and its partners hold events all over the world covering various topics related to 3ds Max and the partners' respective software. We can participate and begin to develop contacts with people who are just as interested in learning and advancing as we are. These people provide both a different perspective and widened branch of experience we can tap into. To see such events, visit https://www.autodesk.com/events.

Next are user groups. AUGI maintains the most active independent Autodesk user group on the planet. Local groups meet face to face to discuss everything from challenges they face to upcoming technology. To learn more visit https://www.augi.com/local-user-groups.

Finally, Autodesk University is arguably the largest gathering of design professionals and Autodesk software users in the world. The event brings together some of the greatest minds to present what's coming and ways to tackle existing challenges. To learn more about it visit http://au.autodesk.com/

FORUMS

Forums are a powerful way to obtain information. In a sense, forums are a platform for discovery learning, where users draw on users' experience to solve problems, gain knowledge, and discover new ways to use that information. Outside of AUGI and Autodesk, some of the forums I find helpful are:

+ Area by Autodesk – Autodesk continues to strive toward providing a platform for CG professionals through the Area at area.autodesk.com. The Area offers tutorials, blogs, galleries, forums, and more.

+ CGTalk by CGSociety.Com – CGSociety members are probably the most experienced and diverse set of professionals I've come across. They know the ins and outs of their software and industry and aren't afraid to show it.

+ CGArchitect.com – Jeff Mottle created CG Architect nearly two decades ago and it remains one of the more active forums around.

VIDEOS/BOOKS
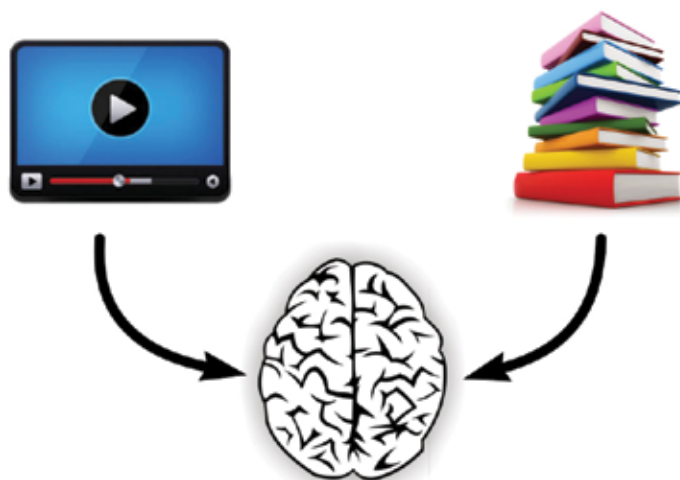
Although videos and books take a respectable amount of dedication to get through, they are often powerful resources for step-by-step instruction and often offer a gem or two that are likely to completely alter the way we do some things. With regard to video learning for 3ds Max, I found Lynda and Pluralsight pretty much offer everything we might need to know to advance with the software while masterclasses available through sites such asGnomon (https://www.thegnomonworkshop.com/tutorials), thecgschool.com, learnvray.com, and private instructors have always been well worth the investment (and support).

Brian Chapman is an Autodesk Authorized Developer, creator of Pro-Cad.Net and Senior Designer for Slater Hanifan Group, a civil engineering and planning firm dedicated to superior client service. Brian can be reached at procadman@pro-cad.net.

Automation does the work while you're sleeping

Ten years after the founding of RTV Tools, CEO Jason Howden says firms need to automate design processes if they want to keep up with shrinking timelines.

While working on some large infrastructure projects I came to the realisation that with all the documentation exporting and reporting we had to do, we just weren't going to make the deadline. Sound like a familiar story?

Then it hit me over a lunch time stroll that what we needed were tools that could automate the complex documentation workflows and turn 30 steps into 3 clicks. And, that has been the RTV mantra in the ten years since.

I went to my soon to be business partners and said let's build some specialised tools that only need to be set up once and will automate everything from exporting between formats, sending to colleagues, and producing reports. No more late nights, and we might even have a chance of making our timelines.

We had an aspiration for worldwide fame and fortune and Ferraris for everyone, of course – who doesn't when they get into software development?

> **"** on the $1.8b Salt Lake City Airport terminal HOK are exporting more than 4700 PDF and 100 NWC files weekly. **"**

But never in our wildest dreams would we have expected that our tools would go on to shape some of the largest projects in the world by automating their workflows.

Projects from the New Karolinska University hospital, one of the world's largest and most complicated health care facility ever documented in Revit, all the way through to assisting with design information on the CERN particle accelerator in Switzerland. Our customers span from sole practitioners in Wellington using our software to do residential design documentation, through to the largest consultancies in the world like HOK and GHD.

For example, when architectural and engineering firm HOK took on the $1.8b Salt Lake City Airport terminal they found themselves having to export more than 4700 virtual prints and 100 Navisworks files weekly from the design model. This posed a real problem because it was taking designers two weeks to manually export and get the information to everyone who needed it, by which time it was already out of date.

Then they started using RTV Tools' Xporter Pro to automate the documentation process. It allows users to schedule tasks to complete including file exports, printing, and files upgrades on Autodesk Revit files. This meant they could set it to export each night and the information would be ready and up to date in the morning.

This was revolutionary because not only were they saving weeks of time over the project, they were able to work on the design right up until the deadline. It was so good they wanted to name

their star "employee", we called it S.A.M – Scheduled Automation Machine.

SAM is a dedicated machine with Xporter Pro scheduled to execute mulitple tasks within Autodesk Revit, such as exporting PDF files at regular intervals, including 2 hours right before that fortnightly meeting. He finds the files, extracts what you need, produces the PDFs, Navisworks, IFCs, saves them locally, or uploads them to the cloud, disseminating information to offices around the world, and all without complaining about the long hours.

Then came the wave of automation. Now firms across the world are now relying on SAM to manage their Autodesk Revit documentation processes for them.

> ❝ **We're saving 26 hours every week, that's $87,150.00 over a year.** ❞

Our tools have gone from just automating manual functions to being able to produce information without user interaction, working while people sleep, and enabling people to collaborate in real time globally.

It has been part of a necessary paradigm shift in creating efficiency, going from 'let's just type faster' to 'let's not worry about having to do this anymore' because the infrastructure has been laid to automatically complete it.

I think the progress of large-scale automation has been hindered by a reluctance to try new things – people know they've got a problem working to realistic timescales but are too afraid to change from what they've always done or they think it will be too expensive.

A US$49 software licence will eliminate thousands of man hours on tedious tasks. To put that into context, on just one project GHD Western Australia saved over $80k in a year by automating these tasks and taking it off designers' shoulders.

We want our automation to be accessible to everyone which is why we have priced our software so that it can easily be adopted by everyone. For that fee you also get online support from a team that prides itself on helping the customer reaping most benefit out of automation that they can.

What's in the future? We are investigating options to scale automation to a much greater level by making use of all the information that the industry is putting into the cloud. I'm talking about predictive workflows.

For example, someone makes an edit to a model and before revisions are made a prompt is raised with the approver requesting their sign off before issuing it as a contract update. So the tools start to understand the processes and certain events will trigger specific workflows.

To an extent we have already begun to achieve this with our Aconex Uploader Tool. When users upload their documentation and drawings to the Aconex platform, RTV's tool will analyse the metadata and pick up any inconsistencies, drawing the user's attention to them. In this way documentation with errors never gets distributed and headaches down the line are prevented.

The automation wave is applicable to everyone in the construction industry, from builders needing to work smarter and procure things over night on time, all the way through to design architects wanting to leverage time scales that are forever reducing.

The global population is expected increase by a billion in the next 50 years and the industry will need to automate to keep up with the demand for housing and facilities. Construction, engineering, and design firms need to embrace automation and the money and time it saves if they want to compete in a digital world.

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tel: + 64 4 473 3888

RTVTOOLS

AUTODESK
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Online CAD Training Insights

Just like any other profession, the training industry has seen lots of changes in recent years. Lots of new platforms and trainers have flocked to this lucrative and saturated marketplace, which has resulted in stiff competition. The competition is good for the industry as it forced trainers and training platforms to deliver the expectations of the trainee and focused on the quality of training rather than just delivering the obvious content to the audience repeatedly.

I train corporate clients as well as university students with different training methodologies such as onsite training, online instructor-led training using Cisco WebEx and, more recently, my video course platform, SourceCAD.

I have learned a lot during from these training sessions. In this article, I will share some of these experiences along with some tips for succeeding in the CAD training industry, especially if you are delivering the training online.

NOT ALL AUDIENCES ARE ALIKE

Every audience is unique and the course content you prepare for one audience might not be suitable for another. Although there are enormous differences between a university student and a corporate team, there is also a lot of variation within corporate teams or different student groups at the same university.

Before every training you need to prepare the right set of tools and content for your audience, and it should be made specifically for that audience type. Don't make generic content and impose it on all audience types. While developing your course content, keep in mind factors such as audience size, their specific needs, the trainees' level of expertise, their willingness to participate in the training, the projects they are currently working on, and how this training can help them in completing their projects. These factors will determine the overall content of your training.

AVOID CLUTTER

If your audience is a team of new interns or recruits just beginning to learn the software, then you will want to keep things simple and focus more on practicing the tools than on teaching more tools of the software. On the other hand, if your audience contains CAD software pros and they have opted for the training of a specific module of the software, then you will want to remove the obvious stuff from the training and focus more on the tools they require for their projects.

Focusing more on tools required for projects will give the audience a sense of fulfillment from the training and will keep them interested in the training sessions. In addition, by focusing more on the tools they might use in their projects you will be able to avoid clutter in your training content and keep things simple.

DELIVERING ONLINE TRAINING

Online training is different from onsite training where the instructor is physically present in the training room and interaction is frequent between trainer and trainee. There are two main types of online training methodologies: live, instructor-led training and pre-recorded training sessions.

Live, instructor led-training sessions are presented via online meeting software such as Cisco WebEx or GoToMeeting.

One of the best advantages of this training mode is the reduced cost and hassle. The trainer does not need to travel to the location of the meeting, thereby saving travel and accommodation costs.

Another mode of online training that is becoming increasingly popular is the pre-recorded video lecture. This mode offers lots of flexibility for student as well as instructor.

With pre-recorded courses, the instructor is not required to remain available during the training period and students also have the flexibility to choose the time they will take the training, which eliminates any time constraint issues.

EQUIPMENT REQUIREMENTS

All of this sounds good, but before you begin teaching online you need to equip yourself with some hardware and software that are not directly related to your CAD software.

A standard headphone with microphone is sufficient for most of the online instructor-led training sessions and you will also need a subscription to the webinar or meeting software. There are plenty of webinar software packages available and your choice of software should depend on your audience size and frequency of training sessions.

Almost all the software will offer basic tools such as screen capture, chat support, and video calling features, which will suffice for these training sessions.

If you are planning to create video lessons, then you may need to buy recording equipment and set up your recording room for professional-quality video lessons. The most preferred microphone choices are Blue Yeti or Rhode Podcaster, which are high-quality USB cardioid microphones great for vocal recordings.

You can use screen capturing software such as Camtasia Studio for recording your lectures and vocals. This software is very easy to use and has a clean interface, so even beginners can get up to speed quickly. The software allows you to record, edit, and produce your lecture videos in simple video formats such as MP4 or FLV.

Tip: Cover the walls of your recording room with curtains or sound dampers to make it more recording friendly.

TRAINING TIPS

Setting up the equipment and software for your training is only half the work—of equal importance is the content of your training. Following are some of the guidelines for recording your training lectures.

The attention span of a student is short, so restrict your video lectures to five minutes. Also, make shorter courses focused on specific software topics. For example, I have made separate AutoCAD® courses on topics such as Sheet Sets, Dynamic Blocks, and Printing & Plotting. These courses are more likely to attract the attention of students who only want to learn a specific topic.

Student feedback is crucial for your success in online training. You should always ask for reviews and feedback from your students and then use that feedback to improve your upcoming courses and training sessions. It has been my experience that negative reviews always have something to teach you and they help greatly in improving your courses. You will find the most honest reviews coming from people who rate your course as "average."

Another recommendation is to offer a few of your paid videos for free on YouTube and other platforms to attract potential subscribers and students. This will also help you in promoting your brand and will ensure your online presence for a long time.

Jaiprakash Pandey is a Mechanical Engineer currently working as a CAD Corporate trainer. He is an AutoCAD Certified Professional and an Autodesk Expert Elite member. He provides training in AutoCAD, CATIA, and other CAD products to corporate clients. He is a regular contributor to AUGIWorld magazine and develops AutoCAD video courses for Pluralsight and his own platform, SourceCAD. You can reach him on his blog: www.thesourcecad.com

Inside Track

by: Brian Andresen

Welcome to *AUGIWorld* Inside Track! Check out the latest opportunities to advance your skills, processes, and workflows in your firm, with the most current AEC-related software and hardware updates available.

https://xinaps.com/

XINAPS SUITE

Xinaps is setting the standard for data quality validation within Autodesk® Revit®. By automating the process of analysis, these tools ensure compliance with local building regulations in early stage of project development. From the inception of a building design, five aspects need to be taken into consideration. Xinaps Suite dedicates a tool to support each of these equally important themes, helping an architect to streamline building regulation process.

* Ensure compliance with local building regulations

* Visualize data as 2D or 3D overview

* Full synchronization with latest design iterations

Financial Simulator – enables the AEC professional to estimate the cost and profitability of the building and see how changes in design affect it. Is also makes it possible to present cost scenarios options to the building owner, helps making well-informed decisions regarding design.

Spatial Requirements Assistant – optimizes building spaces by monitoring all functional requirements. The plug-in performs model checking based on pre-listed specifications.

AUGIWorld brings you recent developments in Autodesk and related software items
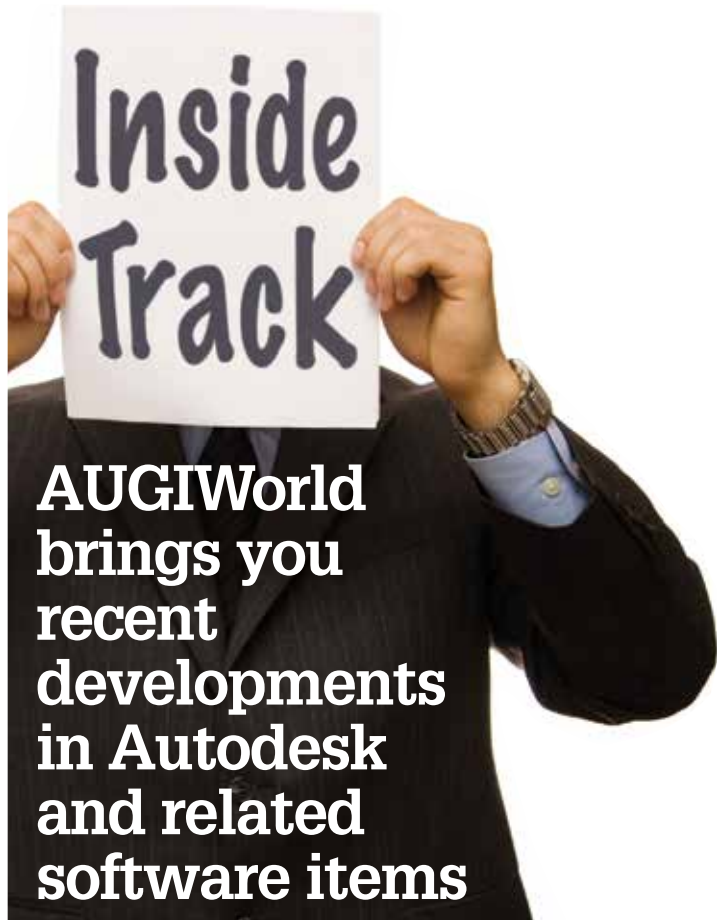
Daylight Ratio Evaluator – automates daylight area analysis of your building model based on local standards. As a result, optimal design decisions can be made regarding glazing, and better working and living spaces are produced.

Accessibility Evaluator – ensures full accessibility to your building and within it. Set requirements for moving elements: hospital beds, wheelchairs, cars, etc. Set critical values of the building to evaluate whether it is accessible.

Fire Safety Assessor – puts the safety of the building at your fingertips. Calculate egress path length and time from any spot, visualize and analyze it. Evaluate fire hose placement and area coverage and provide reliable data on the safety of the building.

http://bimtrack.co/en

BIM TRACK

BIM Track™ is a web-based collaboration platform that empowers your team with better coordination workflows. BIM Track provides a central hub for all coordination information from design to construction. With information at your fingertips, you can get access to your data anytime, anywhere, either from a desktop or mobile device. Charts and graphics help understand data and your management performance through precise metrics. We promote Open BIM workflow solutions by supporting IFC (Industry Foundation Classes) and BCF (BIM Collaboration Format).

http://www.augmentecture.com/

AUGMENTECTURE

AUGmentecture is a service that helps you view complex 3D models on a mobile device in an Augmented Reality format.

With the help of the AUGmentecture plug-in, you can seamlessly and securely upload your 3D models and floor plans directly from Autodesk® Revit® to your AUG account to view them later with your mobile device. You just need to select the model in 3D view and optionally select floor plan and you will be able to see the model on your mobile device mapped on your floor plan.

AUGmentecture's goal is to make augmented reality a day-to-day design communication and collaboration tool for architects, designers, and artists.

If you have some news to share with us for future issues, please let us know. Likewise, if you are a user of a featured product or news item and would like to write a review, we want to know: brian.andresen@augi.com
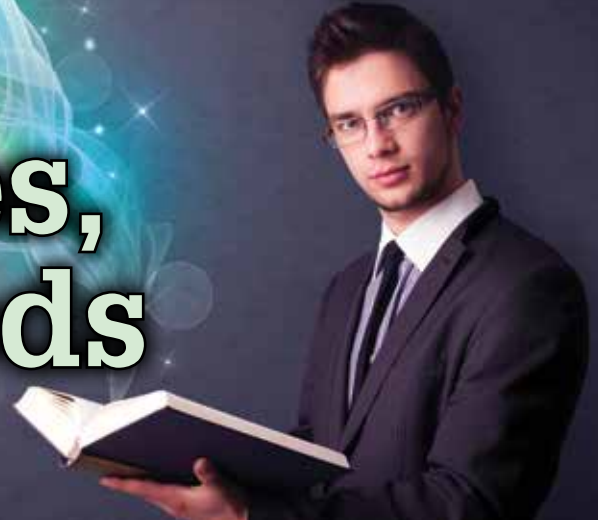
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Civil Engineering Education: Three Styles, Five Methods

It's that time of year again—projects slow down, Autodesk University is right around the corner, and you're looking to find something to help fill those continuing education (PDH) hours you need.

This article looks at some of the ways in which education is affecting the civil engineering community today, and how it is changing the way people stay current in the industry.
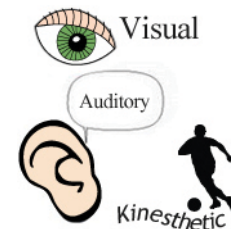
THE LEARNING STYLES

Did you know that we have learning styles? I bet not. Each of us learns in our own way. The best way to learn is to understand which learning style works best for you, and the best way to teach is to incorporate all the learning styles.

Let's break down the learning styles. There are three learning styles, known to some as VAK, and those can be turned into five unique teaching methods.

The first learning style is Visual, or seeing. As a visual student, you learn best by reading or by simply seeing the material. A vocal track or instructor talking doesn't really do much for you. Most likely, you've discovered that online eLearning seems to fit you well, as a good portion of online classes require you to read the course material and then take a test.

The next learning style is Auditory, or hearing. You can read a book, but it may seem like gibberish. Yet, if you have someone read that same book back to you, it all clicks. If that's you, then as an auditory learner, you learn best by hearing the material. You'll need to attend a class or have online eLearning lessons that are audio recorded.

The last learning style is Kinesthetic, or physical. This is what I call the "do-er" style. You literally must perform the action that is being taught, or "feel" the action being taught before you understand it. For you, classic labs are a great way to learn, as well as online eLearning where you must follow and repeat the steps that are shown visually. An apprenticeship also works for you.

So now that you understand the three basic learning styles, there are five teaching methods that accommodate those learning styles.

Some people learn by their individual style only, therefore the first three teaching methods are: Visual, Auditory, and Kinesthetic (VAK).

Others, though, require a combination of those three learning styles to truly understand what is being taught. The fourth teaching method is pairing the three learning styles into combinations: Audio/Kinesthetic, Visual/Audio, or Visual/Kinesthetic.

Finally, when you combine all three learning styles into a single teaching method, you can almost guarantee that everyone will benefit from what is being taught, regardless of the subject.

Now, I need to give credit to my father here. He taught me all this, as he is a teacher of 45+ years in mathematics at various colleges in the northwest. If you took a math class from Mr. Weeks, then you know exactly what I'm talking about, as he always taught to the five teaching methods.

CLASSIC CLASSROOM INSTRUCTION

University/College/Community College Classes

Most education these days is taught in a classroom setting at a university, community college, or private college. You attend the class with a hundred other students and learn from chalk and talk. That's right—chalk and talk! The teacher or professor stands at the whiteboard or chalkboard, and starts chalking and talking about the subject. If you're lucky, the teacher may use other visual aids, such as a projector or PowerPoint, but, either way, the entire class is lecture-based. Sometimes a book is provided, and sometimes not. You're expected to take extensive notes and then be tested on them weeks later. Yes, this gets you the extra continuing education hours you need, but do you really have time for this?

To be honest, not everyone learns well in a classic classroom setting. Thankfully, as technology has grown, so has teaching and the way in which we teach today.

CONFERENCES

Once you leave the college scene, you may not want to go back there just to learn something new. Cost can be an issue. Also of concern is whether the college is really in the know about current trends and events in your industry. You may find that a conference is a better location to pick up those continuing education hours, and it is a place to learn something new from those currently in the industry.

Conference Classes

Similar to classic instruction, today's conferences offer a classroom setting where technology (and not the whiteboard) is used. You still learn from an in-person talk, but the instructor uses Power-Points, video, and other aids to make the topic more engaging and exciting. Unlike classic instruction, you're not tested on what you learned. The fact that you showed up and sat through the presentation is enough to acquire the continuing education hours.

Conference Lab Classes

Some conferences also have labs, which works great for the kinesthetic learner. In the lab, you can hear, watch, and sometimes read the material being presented, and then you perform the skill to learn it better. The downside is that most labs do not have enough computers for those who attend, so you're either sharing a laptop or the lab size is very limited. Another downside is that if the material presented doesn't work with the supplied example files, this can create confusion. Another possibility is that too much material is presented at one time to complete the task within the allotted lab time.

Civil 3D

Conference Locations

One great thing about conferences is that they are held all over the world by various groups. Some are held by manufacturers of the products you design with, such as Storm Con. Others are held by the agencies that set the design guidelines, such as AWWA or AASHTO. Also, you can find conferences that cover specific software programs, such as Autodesk University, Bentley Institute, and Midwest U. Still, there are so many conferences offered today in so many locations, there's bound to be one that fits your needs.

Virtual 3D model based on reality
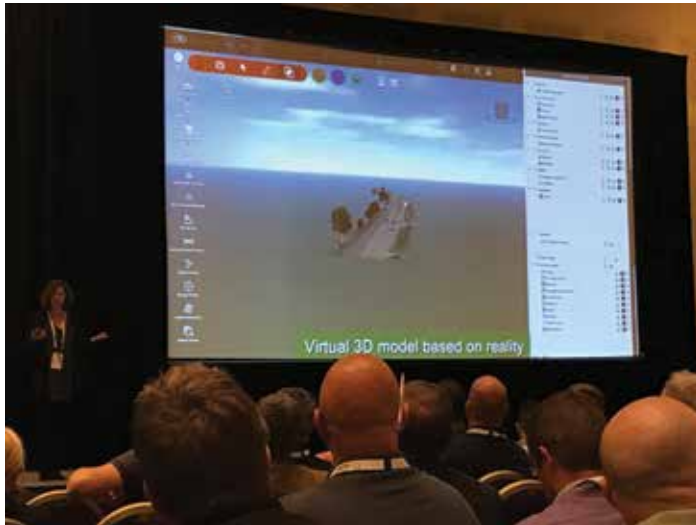
ONLINE ELEARNING

When your schedule is so tight that you don't have time to take a college class, and your company is not willing to cover the cost of flying you to a conference, paying the registration fees, and covering the hotel costs, the next best option may be online learning, or eLearning. In most cases, this will cover your continuing education hours if you can find an online course that is accredited. But if you don't need the extra hours and just need to learn something new, like a new program or an update to a product you've been using for years, then eLearning may be just what you need.

Software eLearning

There are various sources for eLearning out there today. For software program training and education, you can look at:

* LinkedIn Learning https://www.linkedin.com/learning/me?trk=nav_neptune_learning

* CADLearning https://www.cadlearning.com/
* Udemy https://www.udemy.com/
* Bentley Institute https://www.bentley.com/en/learn
* YouTube https://www.youtube.com/
* Autodesk http://au.autodesk.com/

These are just a few examples. The list of available sites from which to get software training can go on for miles.

Variable Topic eLearning

When it comes to learning a whole new subject and not just a software program, you may find a college or two that offers accredited courses. These courses are only a few months long and you can take them at your own pace. For instance, the University of North Dakota is currently the only college I know of to offer an ABET accredited BS for Civil Engineering that is fully online. Some colleges claim to offer an accredited online degree, but if you're looking for an online degree program, and especially if you're new to engineering, be sure to confirm with ABET before you take that plunge and fork over the deposit (www.abet.org).

Agency eLearning

Other eLearning resources include agencies such as AWWA and AASHTO. In some cases, you may have to purchase a DVD. For instance, AASHTO has both free and promotional courses on its website beyond the base online training courses that you pay for. The best part is they tell you up front how many PDH hours a video provides if you view it (https://training.transportation.org/browse_bookstore.aspx).

Let's not forget the manufacturers. Many manufacturers offer online eLearning as well, so you can use products to their greatest potential, as they were designed to be used.

Trends in Online eLearning

If you're thinking eLearning may be for you, let's take a quick look at some of the most recent eLearning trends.

The first trend is Social Media. Twitter, Facebook, and LinkedIn allow us to collaborate more with other students and colleagues outside of eLearning and classic instruction. This also gives those students who are less likely to speak up in a classic classroom situation the ability to use their voice and ask questions and share ideas.

eLearning games are another way to capture and maintain your attention as you're learning. Some eLearning providers are applying game dynamics into the context of their lessons. Gamification is creating results that motivate students to achieve a goal in a fun environment.

Wearable tech—whoever thought wearable tech would be a training tool? Products such as Oculus Rift, Google Glass, and smart watches are all being integrated into today's training and working environments. These products provide a unique way to interact with new information in a dynamic method. Keep your eye out for lessons that use wearable tech to immerse you in a learning game.

Blended Learning is where the classroom meets the board room and the game room, all at the same time. No longer is blended learning seen as only the classic classroom setting plus online training. It's now a combination of many different learning strategies, through channels like synchronous and asynchronous, multi device learning, and mixing courses with different resources.

Finally, there is Responsive Learning Management Systems, or RLMS. The huge growth of virtual learning has resulted in a serious increase in data, information, coursework, and communication. Through RLMS, eLearning companies and teachers are now better able to administer, track, document, and report classroom and online material. This allows educators to better tailor their curriculum and lesson plans according to the student's preferences and needs, creating a more customized and personalized learning experience.
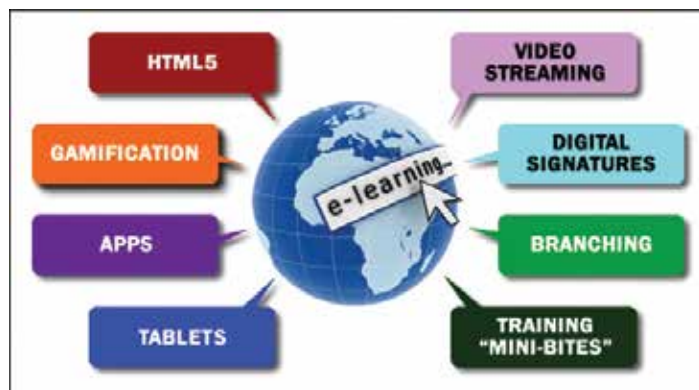
ONSITE LEARNING

Another innovative training technique that is being used today is onsite training. The process has been around for years, but not everyone takes full advantage of it. Some onsite training can fulfill those needed PDH hours, and some does not. Training and education can vary from software updates to industry challenges and changes. Although not as inexpensive as online eLearning, onsite training gives you the ability to ask questions that may not be answered at a conference or via online eLearning. You can have a customized training or education plan laid out for you and your company as well.

Just about any manufacturer is willing to come to your office and give you a demo or train you on how to use their product. Software companies may make you pay a fee, unless onsite training was written into the software purchasing contract. Still, this is a great way to get hands-on training in a limited amount of time. Just imagine—wouldn't it be great if a drone company came and showed you how to use their product and include that data in your design models?

CONCLUSION

There are so many different education options and directions that I am sure you can find something that works for you and fits within both your budget and your time frame.

I would love to hear from you regarding Civil Engineering and education in today's world. Feel free to contact me anytime.

Heidi Boutwell is the Infrastructure Content Manager for all infrastructure CADLearning products from 4D Technologies, developing on-demand learning material for Autodesk software, including AutoCAD Civil 3D, Autodesk Vehicle Tracking, AutoCAD Map 3D, InfraWorks, Navisworks, BIM 360, BIM 360 Field, and BIM 360 Glue. Since 1998, Heidi has made a career of teaching engineering professionals how to use the Autodesk infrastructure design tools to increase their productivity and improve their design modeling skills. Heidi also continues to utilize Autodesk tools to create a variety of infrastructure projects for various clients. She is a contributing author and is an Autodesk AutoCAD Civil 3D Certified Professional. Heidi serves on the InfraWorks Customer Council, is an Autodesk Civil 3D Gunslinger, and an Autodesk Civil futures member, helping to drive the strategic direction of product development for infrastructure products for Autodesk. Heidi is also a repeat speaker at both Autodesk University, Midwest U, and the Revit Technology Conference (BILT), North America. She can be reached for comments or questions at hboutwell@cadlearning.com

CAD Manager

by: Mark Kiker

Being Trustworthy

I was in the Boy Scouts and loved it. I did not get to the highest ranks—I made First Class, but went no further. I was not an Eagle. I have fond memories of crafts and merit badges. Great stories about outings and campouts. I even went to a Jamboree. I remember observing and Order of the Arrow ceremonies. I recall learning the knots, how to properly handle a hatchet, how to wear my uniform in the right manner, and so much more. Anyone who was in the Scouts shares many of the same memories.

What has stayed with me the longest is the character building that happens through the scouting program. They not only work on skills and discipline, but also on building personal character.

The Scout Law: A Scout is trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean and reverent.

That is the Scout Law. Those words are burned into my brain and I am still encouraged by them (and led by them). I still strive to be all that I can be (a military slogan). I still want to embody the things that scouting taught me.

I want to ponder the first trait in that list in this article—Trustworthy. You do not hear that term used much anymore. It seems so archaic. But it is so valued by every society on the planet. Being trustworthy is placed first in the Scout's list and I think it is of premiere importance.

WHY BE TRUSTWORTHY?

Steven Covey may have said it best in his book, *The Speed of Trust:*

"There is one thing that is common to every individual, relationship, team, family, organization, nation, economy, and civilization throughout the world – one thing which, if removed, will destroy the most powerful government, the most successful business, the most thriving economy, the most influential leadership, the greatest friendship, the strongest character, the deepest love.

On the other hand, if developed and leveraged, that one thing has the potential to create unparalleled success and prosperity in every dimension of life. Yet, it is the least understood, most neglected, and most underestimated possibility of our time.

That one thing is trust."

Have you ever heard someone say, "Scout's honor" when they promise to do something? That is a common phrase use to invoke trust by others. The person is placing his or her honor on the line if the trust is broken.

In 1915, Arthur A. Carey wrote the following in a little book called *The Scout Law in Practice:* "A Scout's honor is to be trusted. If he were to violate his honor by telling a lie, or by cheating, or by not doing exactly a given task, when trusted on his honor to do so, he may be directed to hand over his scout badge."

When trust breaks down, all may be lost. Everything we do is based on trust. We trust that others will drive on the correct side of the road. We trust that the chair we sit on will carry our weight. Trust is our default mode. We only mistrust when we have a reason to be wary. We grant others trust that they will do what they say they will do. We need to prove that trust to others through consistent verification.

BUILDING TRUST

"If people like you, they'll listen to you, but if they trust you, they'll do business with you." Zig Ziglar

Having trust at work is crucial to success. Those around you must know that they can trust you and you must invest in building trust. It cannot be demanded, it has to be earned and not lost. Usually people will grant you trust, but you have to secure what they have given to you by demonstrated behaviors that engender trust. Here are just a few areas to consider.

Be Honest

Tell the truth, the whole truth, and nothing but the truth. We typically do at least two of these all the time. But do you shave the completeness of your truth? Do you ever hold back the truth? I am not talking about just blurting out what an ugly dress she may be wearing, or what a stupid answer he just gave. We all hold those comments back to be polite. I am talking about telling people at work the whole story, including any mistakes you made along the way. If something does not work right, tell them what went wrong even if it means exposing a mistake you made. Most will pardon you for an occasional mistake.

Be Consistent

Oh, this one is tough. People trust those they can count on. And counting on someone is bolstered by them knowing how you will react. They know how you will react by watching your past behavior. If it is consistent, they can judge what you might do. If it is dependable, they can bank on it. If you are reliable, then they can trust you.

Keep Your Word

If you say you are going to do something, then make sure you do it. This is akin to being consistent, but is focused on aligning your actions to your words. What do you promise to do? What do you say you will not do? Keep your actions in line with your words. If you promise something by a deadline date, then deliver. If you say you will provide support, then give it. If you tell others you will not change your mind, then stick to your word. And if you cannot keep your word, then don't give it.

Hold Confidence

The workplace has many conversations that are private, personal, or confidential. Some are related to personal family issues and should not be disclosed to others. If someone shares news with you (good or bad) make sure you do not pass it on without permission. It is their news, not yours. Some conversations are private and need to be held in confidence because they are not meant for wide audiences. Do not shout from the rooftop something that was shared in private.

Some discussions are confidential. They are management topics that impact the business and should not be widely spread throughout the firm. If you are a Tech Manager, you may hear rumblings of business disruption, impending downturns, client defections, contract disputes, or delays in project kickoffs. All of these are confidential until management shares them widely. You should keep a lid on this information. Leaders will notice that you can hold a confidence and will trust you with future discussions.

By focusing some effort on retaining or regaining trust, you can encourage others to rely on you and have confidence in your words. This will advance your career and increase your impact on your firm, friends, and family. When attacks come on your trustworthiness, you will "Be Prepared." (I couldn't resist one last Scout reference.)

Mark Kiker has more than 25 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. As an internationally known speaker and writer, he is a returning speaker at Autodesk University since 1996. Mark is currently serving as Director of IT for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two blog sites, www.caddmanager.com and www.bimmanager.com.