The Necessity of Content Management and Project Analytics

CTC SOFTWARE™
DESIGN SOLUTIONS

HIVE™

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The Importance of Content

In the context of Building Information Modeling (BIM), content is king! It is not just the chairs and lockers, it is the walls, floors, beams, panelboards, ducts and... well, it's *the building!*!Having a rich content library that design teams can depend on is so important, it is hard to put into words. High quality, curated content not only makes the design process more efficient, it can even improve the end result, again... *the building.*

In addition to maintaining a collection of families which represent common objects, shapes, sizes and make/model, this content can also embody years of design knowledge, experience and regulatory information. Reference data such as UL and STC ratings, height limits, deflection values, cfm ranges and much, much more are included. Not only does this aid seasoned designers, as they cannot remember everything, but it can also have a significant impact on junior staff and their career trajectory. The common saying that knowledge is power holds true here as well. Understanding the nuances of every design decision is exactly what leads to a beautiful, functional, sustainable building and a satisfied client and end user.

Given the significant value of content to architects, engineers and contractors it is no surprise that design firms large and small have spent years developing standard content, including 2D details, Revit families, textures and more to improve their efficiency, workflows and deliverables.


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Introduction

The design world has changed considerably in the last twenty years, from the first time I attended a presentation by CTC Software's Shawn Zirbes on AutoCAD Architecture (previously ADT). Back then they were leading the charge on Autodesk's most advanced product in the AEC industry. Fast-forward to today and they are doing that and so much more to lead the industry with best-in-class tools and solutions within the Autodesk Revit and AutoCAD Civil 3D eco-systems.

In promoting an industry standard and transforming the way Mechanical Electrical and Plumbing (MEP) engineering firm's design and document their proposed solutions, I had the privilege of working with CTC Software over the last nine years. Through our partnership, I worked to develop the Electrical Productivity Pack (EPP) for Autodesk Revit, which has grown to become the MEP Productivity Pack (MEPPP) which is used by hundreds of MEP firms and contractors across North America.

In this article I want to share some thoughts around the important topic of content management and project analytics and CTC Software's holistic solution in this space, that being HIVE.

HIVE is an industry leading content management system developed specifically for the AEC industry. Firms can organize, manage, set permissions, and ensure the latest content is kept up to date and available for all project participants, even when working remotely. Users can quickly find Revit, AutoCAD, PDF, images, and other file types quickly using libraries, tags, favorites, and file metadata.
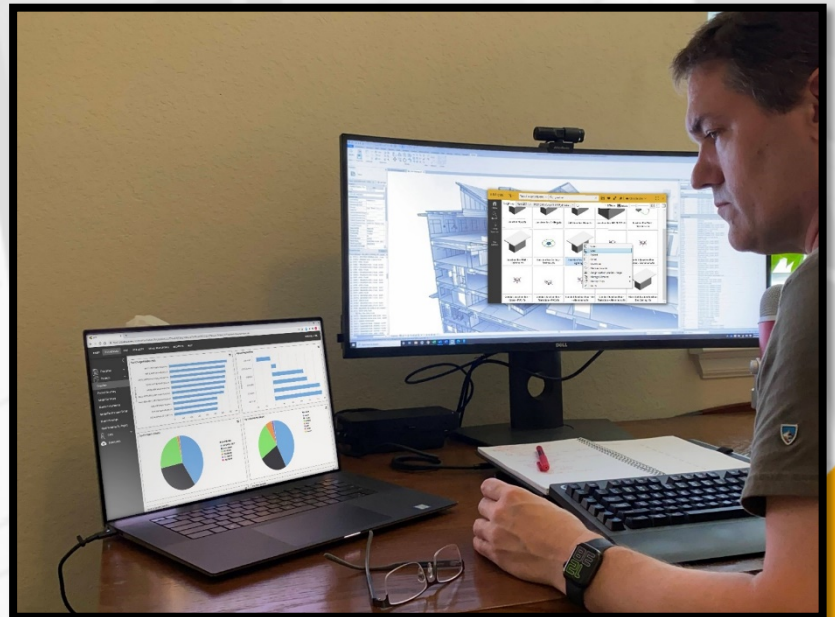
About the Author

A Minnesota native, who recently relocated to San Antonio Texas, I have nearly 30 years of experience in the AEC space. I am a Wisconsin-registered architect and teach graduate architecture students at North Dakota State University (NDSU) and present regularly at the University of Minnesota. Additionally, I have written 14 textbooks; with the Autodesk®-focused books being: (6) Revit®, (2) AutoCAD®, (1) AutoCAD Architecture®. My Residential Design using Autodesk Revit 2021 is the #1 Revit book in the academic market in North America. I also write posts for my blog, BIM Chapters, and for Enscape's blog. I am currently the Director of Design Technology at Lake Flato Architects, the #1 U.S. Firm on the 2019 ARCHITECT 50 List.

The Content Challenges

Today, many firms are still using the same techniques used twenty years ago to organize and place content into their projects: using network drives, folders, file naming conventions and VPN for remote access. While these methods theoretically can work, they often lead to disparate pockets of content, experienced staff going back into previous projects for content and a broken feedback loop on content maintenance needs. This results in junior staff being left in the dark, content becoming obsolete and a significant reduction in efficiency.

Disparate Pockets of Content

When a firm does not have a well thought out plan around content management, many problems manifest themselves. One such problem is design teams, or studios, begin to maintain their own content. These subsets of firm content then tend to morph and use unique shared parameters and custom schedules.

This fragmented situation results in significant challenges for junior staff and interns who often need to jump between projects to help meet specific deadlines. It can be very frustrating to have 'type' parameters for doors in one project and 'instance' parameters with a slightly different naming convention on the next.

Previous Projects

Going into a previous project for a Revit family or detail is great if you have worked on a previous project in the firm. Well, truthfully, this practice is not great and is incredibly inefficient. Opening old projects can consume a lot of time.

For example:
- Looking for the project
    - Which may be archived
- Opening the project
    - Possible time upgrading the project
- Finding the desired content within the project
- Dealing with possible interoperability issues

Another significant problem with going into old projects is the curated content with embodied knowledge, mentioned previously, is being bypassed. Perhaps a significant liability was discovered using a standard detail on a previous project that resulted in a lawsuit, affected the project schedule/budget or was flagged by the building official. The standard practice would be to update the content or detail to inherently avoid the problem on future projects.

Broken Feedback Loop

Honestly, most of the problems around content management steam from a broken, or missing, feedback loop. It is hard to maintain something if, for example, the driver of an automobile can never talk directly to the mechanic, so he can explain the problem to her.

Remote Access

In the midst of the global COVID-19 pandemic, many design firms quickly discovered a significant new challenge: accessing content remotely. This is especially true for staff who have a company laptop they took home, or those using a personal computer with an Autodesk 'named user' or 'home use' license. Those folks are easily able to work remotely in Revit projects via BIM 360 Design, but to access their custom content, they must use VPN to connect to their company's file server, which slows down their system, reduces their home internet bandwidth and it simply not ideal.

The Content Solution

While not all challenges can be resolved by a software solution, communication and leadership are still important, the industry does have access to a mature content management system (CMS), that being CTC Software's HIVE.

HIVE is a full featured CMS that not only manages the content, it enables a seamless feedback loop, supports metadata, cloud-based remote access, and multi-firm teams.

HIVE breaks free from the confines of traditional folder structures, which allows content to be organized in various ways for specific studios and multi-firm projects. All along, maintain a 'single source of truth' for each instance of content.

Content can be discovered in various ways by the design team, based on their preference, what they currently know, by custom tags, or even specific parameter values within content. In the example image above, the user simply entered 'swing door' in the search box to instantly reduce what might be thousands of families down to a few dozen.

Various ways to discover content in HIVE:

- Search
- Filter
- Parameter value
- Revit Version
- Revit Category
- Rating
- Favorites
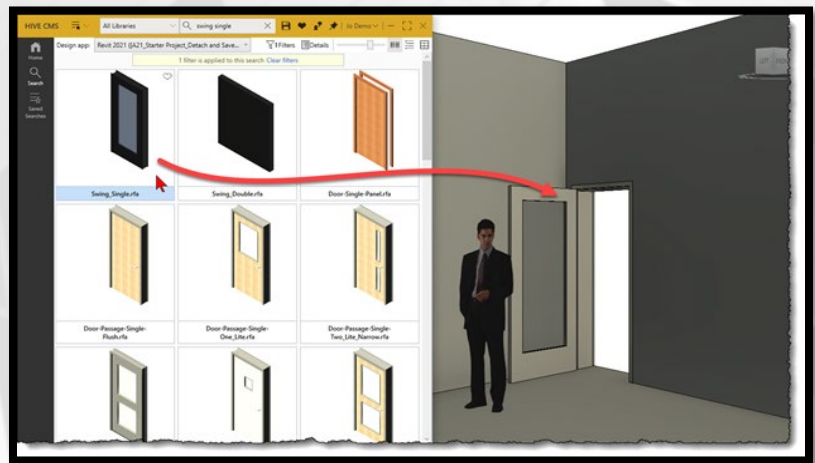
All content in HIVE can be automatically stored securely in the cloud and accessible from anywhere. Hive can be installed on any computer, even standalone, allowing users to simply log in to gain access. External users can be given special rights to access a sub-set of content to improve multi-firm collaboration.

HIVE also facilitates a seamless feedback loop between the content creators and the end users. Per the example shown below, each item can be ranked, reviewed, and commented on. This also creates a more trustworthy and transparent library, leading to increased use, acceptance, and efficiency within an organization.

Finally, HIVE users can be batch created based on a firm's Active Directory data and then assigned to HIVE 'groups' which have pre-assigned rights and library access.
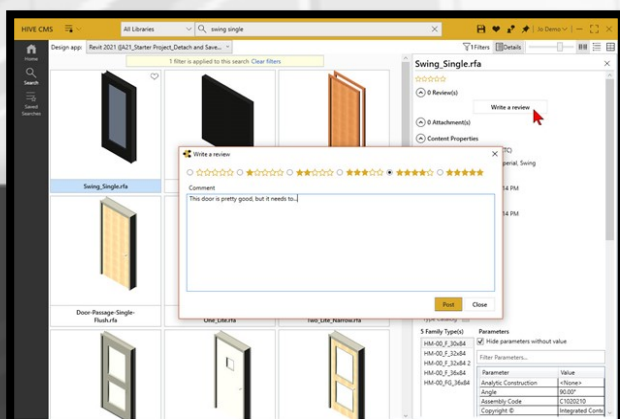
Thus, no more sync'ing libraries between branch offices, or using VPN just to access content. HIVE just needs to be installed with an active user logged in, and a wealth of up-to-date content instantly becomes available for use in multiple versions of Autodesk Revit, AutoCAD and more.

For a complimentary article I wrote for Enscape related to the challenges of #wfh (working from home)
check out this post: [COVID-19: Working From Home Tips to Get You Through the Crisis.](#)

The Importance of Analytics

Switching gears, let us talk about another concept growing in interest and importance within the AEC community – that being data analytics. As the architectural design and construction process becomes more and more digitized and embraces computational design, we have increased opportunities to employ analytics for a host of uses.

In the realm of Revit, some analytics opportunities are:

- Project size
- Project warnings
- Project naming conventions
- Project open duration
- Project deadlines
- Sync w/ central duration
- Training needs
- Content usage
- Content file size
- Staff scheduling
- Revit version, including updates

The list could go on, but this is sufficient to allow BIM management and even upper management to imagine how they might leverage this data to improve workflows and even predict problems with Revit models or project schedules.

Thus, data analytics within AEC will continue to grow, helping management make better, more informed, decisions and avoiding costly pitfalls.

The Analytics Challenge

The challenge for most has traditionally been a barrier to access. With important data housed in various locations and databases, such as Deltek Vision, Microsoft Excel/Access, Autodesk Revit, AutoCAD Civil 3D, and more, it often takes a specialist to be able to harvest the desired data and present it in a meaningful way, usually in Microsoft Power BI or Tableau.

Specialty consultants have been hired and presentations have been given at previous Autodesk University, and similar, events showing how to piece this type of data together. The problem is these custom systems need to be maintained and updated… especially when Autodesk updates its platforms each year. If the specialist leaves the firm or is otherwise no longer available, the tool will quickly become obsolete.

The Analytics Solution

Given CTC Software's years of experience developing productivity tool add-ins for Revit, such as the Revit Family Processor or SpreadSheet Link, they have been able to automatically harvest a plethora of data and present it within HIVE. Thus, giving AEC firms a formal commercial-grade software offering that is stable and will be maintained and updated.

It should be pointed out that, to give their customers more control, the option to harvest analytics is optional within HIVE. In fact, a separate install is required before any data collection can begin.

Here are just a few highlights within HIVE's cloud-based analytical dashboard…

Model Performance

HIVE tracks each project's warnings as well as the time it takes to open and save a Revit project. Seeing a dramatic spike, on the timeline, is a red flag that something might be wrong. Discovering this early can avoid significant delays and frustrations later. For example, a large dataset, like a site model or complex Rhino model, was imported and may even be corrupt. Catching this before people ignore the slowness and continue to work in a compromised model for another week is incredibly valuable.
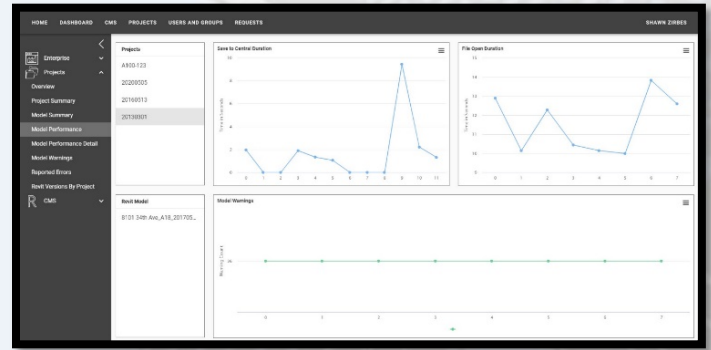

Revit Versions

Being able to track which versions of Revit staff have installed has traditionally been isolated to the IT department and they may use a tool like Kace. HIVE gives BIM management easy access, as shown below, to ensure everyone is on the same build and not using unsanctioned versions, either too old or new.
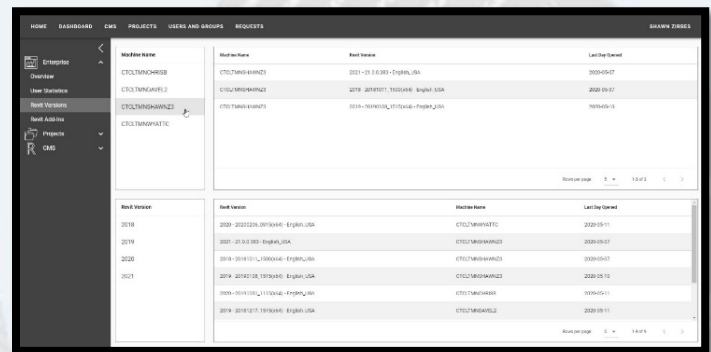
Revit Content

Not surprising, given HIVE is a leading CMS, we are also able to track content usage and other interesting details. Notice, in the image below, we can see which versions of content are being used. And not that size is always an indicator of the quality of content, it can help identify some problems, e.g. a wall-hosted markerboard that is 30 MB is probably worth investigating. Optimized content improves the overall performance and stability of a project.
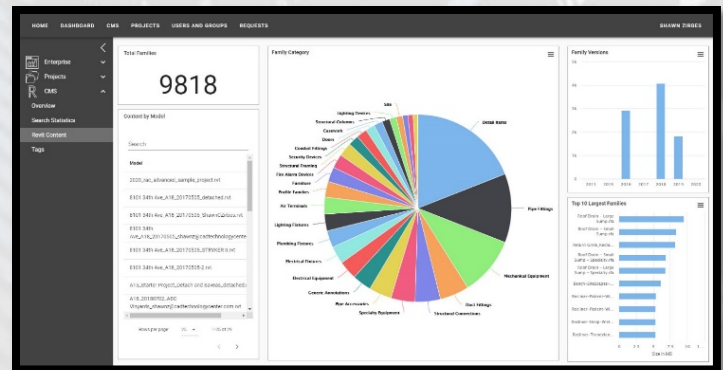
Scheduling

HIVE also provides a window into staff scheduling. Listing approaching deadlines and hours spent, within the design tool, on a project. This can become another metric to track and use to validate overall assumptions on current and future staffing needs.

Conclusion

Paring a robust content library with a leading CMS tool like HIVE, firms can't help but become more efficient, freeing up time to focus on the design and not finding content and reacting to model corruption as often. If a firm does not already have a robust library, employing HIVE can be the catalyst to drive change and start moving in a better direction!

If you want to learn more about HIVE, check out their YouTube channel and documentation on their website, www.ctcsoftware.com. You can also request a demo from their product partners, so you can ask specific questions related to where you are at now.

Finally, the best way to learn about a tool is to give it a try! Download the trial and check it out right after Autodesk University. Coming back from AU with great tips, tricks and tools is always a win for both the attendee and the firm. It is also a great way to get approved to attend again next year, which will hopefully be in-person again!

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