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Managing Your Fabrication Database's Transition to Revit

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Learning Objectives

- Why make the transition to Revit?
- Which route should my company take?
- What about content?
- Should we have training on a live project?
- Moving forward.

Description

The most significant challenge when moving from Fabrication CADmep software to Revit software is your database. Your Fabrication Database has been altered and added to for many years now. But how well will it convert to Fabrication Parts in Revit? The class will review lessons learned from assisting many MEP organizations (from all three disciplines) to successfully move. The class will review tools developed by AEC Resource and MSuite to help you evaluate and prepare your database for the conversion. The tools can help you understand which items in your database may not convert properly, why they might not convert, and how to clean up the properties in your database. The tools will tell you which parts will transition well, and what do you do with those that won't. When do you look at Revit Families to fill the void in your database transition? Moving a project using an MAJ export from either Fabrication CADmep or Revit means you most likely will have some errors. Tools from MSuite will help identify and locate those errors.

Speaker(s)

Jack Trexler brings more than 14 years of experience to his role as a Technical Specialist for U.S. CAD, including work in BIM management and HVAC/plumbing. In his prior positions as Mechanical/Fire Protection Designer and the CAD/BIM Manager, Mr. Trexler produced HVAC and plumbing systems design for office buildings, commercial and retail spaces, K-12 schools, medical facilities, churches, and tenant improvement projects. In these projects, he performed tasks such as conducting cooling loads, running energy calculations for code compliance, performing site visits and providing progress updates, and training teams of up to 70 people. Mr. Trexler provides training via videos, documents, and in-person instruction for Revit software and project standards, and works with architects and owners to coordinate MEP designs.

Zach Smith is a developing developer with experience from AE and MEFP subcontractors and working for a startup MEP productivity software company. Zach has used his experience to develop custom tools to bridge industry gaps, using an agile development cycle while providing guided training for interested developers-to-be. Zach started in AutoCAD learning VB.NET while becoming an Excel Macro Master. From there, the transition into BIM Support was an easy one. He established the BIM processes for an entire division of a national company. After developing tools, training, methods, and guides for the entire company, he left to seek his fortune in Revit add-in development as a Software Engineer with MSuite.

Leonardo Acosta has over 6000 hours managing BIM projects combining experience in commercial, residential towers, medical facilities, transportation, educational, infrastructure buildings and BIM content creation. Spent most of 2017 studying and optimizing the CAD to fabrication workflow for a Sheetmetal fabricator in New York while doing BIM consultancy for other companies. For the last couple of years, he's been using his BIM Manager role in AEC Resource to work closely with MEP Subcontractors guiding their transition to a healthy BIM environment without perishing in the effort.



Jack Trexler



Zach Smith



Leonardo Acosta

Why Make the Transition to Revit?

This could be different for every team or company, and I have shown a few below, but there could be other reasons that are not shown. For this, I would just like to explain a few to help users that do not make company decisions a bit of a background on why they are being asked to do things differently or a CEO a look into at what others are doing in their industry.

Owner or General Contractor's Requirements.

More and more Owners and General Contractors want to leverage data that comes from BIM Models. Owners want to use the data for Facilities Management and have one place to see their project making progress digitally. This helps with ordering replacement parts and general maintenance to their buildings. The data can also be helpful when renovating or adding on to buildings later in their life cycle. General Contractors want to have all the data in one place for constructability, tracking, and QA/QC processes. Owners and GC's can benefit from having their projects hosted on BIM360 giving the project a single source of truth instead of having the data siloed.



Autodesk's BIM360

Workforce and Technology Advancements.

Students at a very early stage are learning to be in a digital world. By the time they are ready to join the workforce, they have already been exposed to working in a digital model. They may already know and used Revit or similar modeling software. This could add additional onboarding costs if the new hires must be taught a software they have never seen before. Technology is changing the way we build things now from augmented reality, cloud computing, and even automation. We can now see our Revit models placed on a project site at any stage of construction and make changes that we couldn't see in a 2D format. The cloud allows us to host all project documentation and give permissions to the team members to view or edit the information. We can automate schedules based on the data coming from Revit models to better track the project status.



Revit is Parametric.

What does it mean to be Parametric?

From Autodesk Knowledge Network: <https://knowledge.autodesk.com/support/revit-products/getting-started/caas/CloudHelp/cloudhelp/2014/ENU/Revit/files/GUID-71F2C8EE-2A90-4076-A6C7-702082566DDF-htm.html>

The term parametric refers to the relationships among all elements of the model that enable the coordination and change management that Revit provides. These relationships are created either automatically by the software or by you as you work.

In mathematics and mechanical CAD, the numbers or characteristics that define these kinds of relationships are called parameters; hence, the operation of the software is parametric. This capability delivers the fundamental coordination and productivity benefits of Revit: change anything at any time anywhere in the project, and Revit coordinates that change through the entire project.

Recently there have been some great tools hit the market to help Revit be more of a fabrication software. One is the BIMPro add-in for Revit that consists of tools to help automate the spooling of pipe and duct and a tool that will validate an MAJ that was created in CADmep and brought to Revit. This will find where certain parts are missing and their information. It also has integration to the FABPro tracking software.



Here are a few of our personal reasons to make the move.

- I find it more user friendly than CAD
- Visualization advantages. Sectioning, filtering, and templates.
- No more "one file per floor" all modeling is done in one file.
- Most of the industry is already working with Revit. The Architectural and Structural models mostly come in Revit format. Linking an Architectural Revit file to your MEP file instead of exporting a flat CAD background.
- More stable, less "fatal error" popups.
- Many more advantages.

Which Route Should My Company Take?

There are a few different paths to take when transitioning.

- Stay in CADmep and import an MAJ into Revit.
- Use 100% Revit families.
- Use a mix of Fabrication parts (ITM) and Revit families (RFA).

There are a lot of factors to take in and should be considered very carefully before deciding the best route. Some have even done a mix of the above to get the process started instead of jumping into one at 100%. Below is a small list of pros and cons for each.

MAJ to Revit

For this path, it's quick to do at first but sometimes can be a big headache. I look at this as a way to have a CAD project in Revit for the sake of having it in Revit.

Pros

- Very quick training – its only a few operations using the Revit Extension for Fabrication.
- Revit visuals – users can use sections, 3D views and filters to visualize the construction.

Cons

- Non-compatible CIDs in Revit - Some parts in CADmep are not approved in Revit and will not show up.
- Custom Data – Custom Data gets dropped when opening the MAJ in Revit.
- Content – Content will need to be created in Revit or using compatible CIDs in CADmep.
- Revit files for backgrounds – it takes time to convert designers' files to CAD to use as backgrounds and is prone to errors.

Revit Families

Many companies go this way to avoid using ITM's in Revit. There is good content available for free and to purchase. Some can even be tailored to a company's specifications. Always check Revit content to a cutsheet to be sure the content is correct.

Pros

- 100% Revit – No need to maintain a database; all properties will be in the families themselves.
- Engineering Calcs – You can use calculations built inside of Revit if you are creating engineered systems.
- Content – There is content available from manufacturers and third parties to download and use.

Cons

- Company's database – All the time and money of modifying and cleaning up the old CADmep database will be dropped (For some this might be a Pro).
- Spooling and Flat Pattern development – OOTB Revit does not have any tools currently for spooling pipe or connecting to machines on the shop floor without third party add-ins.
- Revit Size and Performance – The Revit families can get large and be difficult to work with without using third party tools.

Mix of Families and ITMs

This is a hybrid of all of the above and can be a great way to get started if done carefully. Use Revit Families for parts that are bought out and not fabricated like equipment. Use your database or configuration for parts that are fabricated like sheet metal. Personally, I like to use the ITMs for pipe because the OOTB Revit has tools to manipulate items very similar to the CADmep workflow.

Pros

- Content – Most of the parts that your company uses today will work inside Revit and the users are accustomed to using those parts.
- Functionality – Fabrication parts for Revit (ITMs) work very similar as in CADmep. The fittings rotate as they should, and hangers attach like they do in CADmep.
- Database – the same rules apply to the ITMs in Revit as they do in CADmep like insulation and cut lengths.

Cons

- Content – Above I mentioned most of the parts will work, that means not all. There will be content that needs to be created in CADmep using a compatible CID. There are companies that can help with this.
- Maintain two Databases – The Revit families will need to be stored in a library and a user will need to maintain it. The old database in CADmep will also need to be maintained.

- Engineering Calcs – ITMs in Revit cannot use any of the calculation built inside of Revit.

There are many other pros and cons, and the best advice I can give is to take a look at all your options, ask what others are doing, and pick the route that best suits your company.

What About Content?

This is the hottest topic; everybody that is looking at making the transition to Revit is looking for content. For us, it's very specific in what we need. First it needs to be accurate to a fabrication level, second it needs to be small enough in file size, so it doesn't slow a model down, and third it has to be user-friendly.

Free Manufacturer Content

There is some excellent content that is free in both RFA and ITM formats. These can be found by doing a few internet searches or reaching out to some of your equipment suppliers. Be careful as some of the content that is available for free may not match cut sheets or be bloated and can be confusing when trying to schedule or use the part.

Third-party Purchased Packaged Content

This is probably the quickest entry into Revit, however, most providers will sell you the whole lot, and there may be a lot of parts that will never be used. This is still not so bad because it shouldn't take long to figure out what your company needs and then filter out what you don't.

Third-party Purchased Custom Content

This is where a company will come in and sit down with key players in your company and determine the best content for the needs. Then the parts will be created, quality checked by your company, and then implemented in the process. This will give you the exact parts with the quality that is expected without extra fluff.

Homebuilt Content

If there is an expert at the company, this may be a great option. It will take some nonbillable time from this individual, but if the resource is there, they will be able to fix anything that may come up after implementing the software and content.

Should We Have Training on a Live Project?

My personal preference is yes. A couple of problems with most all training is the data that is used in class and how long we retain knowledge.

Small projects with a good schedule are great for starting out. The project isn't required to be completed with every detail to show most of the workflows, and at the end of the training the project has been setup, and ready to be worked on.

Knowledge retention from a class setting is short, very short. That's why I feel getting the students working on a live project the day after the training is helpful, and having a live project as opposed to having an old project or demo project gives it a deadline that must be met. I find users are quicker to picking up the software and workflows quicker.

Moving forward.

There is a lot to take in when making the transition. You will find that your old workflows don't work anymore, and new ones will need to be worked out. Revit is a developing software and should be looked at every release to see if workflows can be adjusted to use new features and be more efficient. It's also a good idea to keep up with the industry to see how others are using it. Reach out to others in your trade that have made the transition and another great resource is your software provider, they can give you a large picture of the industry. If your company is on the fence, or has started slowly, and has struggled sometimes, its best to jump in with both feet and make it happen.