

AS224316

Balancing the Revit Ecosystem

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Learning Objectives

- Learn how to collect and analyze key performance indicators of your Revit models and projects
- Uncover real reasons behind poor Revit performance and create a practical plan for addressing the issues
- Explore tools available for tuning up your Revit ecosystem (active projects, templates, and content)
- Learn how to assemble functional project teams and identify project-specific training needs

Description

Revit projects, templates, and content require BIM (Building Information Modeling) managers to connect the dots playing several roles: researcher—collecting and analyzing performance of Revit projects; investigator—uncovering underlying problems; and janitor—facilitating cleanup and fixes. To keep your Revit projects at peak performance, it is vital to identify performance concerns early, anticipate problems, and understand underlying issues. We will focus on automation of reporting and maintenance of the Revit ecosystem as a whole, and clamp down on the usual suspects. After this class, you will be able to holistically analyze your Revit environment, and implement practical steps toward its improvement and fine-tuning.

Helen Gorina

Knowledge and experience that span multiple BIM and CAD platforms, architecture and engineering, information technology and change management.

More than 20 years of experience in BIM and CAD management for multidiscipline, multi-office environment. Superior skills in all aspects of Design Application management, analysis, automation, training and support in Architectural and multidiscipline environment. Strengths include standardization, document management and collaborative workflow setup efficient project delivery

Chris Coscia

Has 23 years of experience in architecture, focused primarily on the integration and successful delivery of projects utilizing all digital and BIM platforms. Working with multi-disciplinary teams of architects, engineers and specialty consultants, my goal is to establish and maintain a high level of technological standards in service of the project and in service of the client's team. Instructs project leaders on how to understand the process of managing a BIM and the use of BIM in the design and documentation process.

Projects

Many factors contribute to a BIM projects success, and many documents and workflows comprise BIM projects.

We focus on the Revit component of a BIM project in this class

Let's analyze how parts of Revit ecosystem are interconnected and how they contribute to project success. As with sustainable ecosystems in nature, the key is to find balance between its parts.

What is a KPI of a Revit project? It is the happiness of the project team, and their ability to leverage technology to be efficient in their work. Some gauges of team happiness are

- Open and sync times
- Navigation and editing speed
- Ease of authoring

The elements that lead to well-run (at least from the technology point of view) projects are:

- Project planning
- **Project maintenance**
- **Good project templates**
- **Easy availability of appropriate content**
- **Team skills and training matching project tasks**
- **Disaster prevention (toxic actions prevention)**
- Automation of repetitive processes

Most of us have constraints so you must know where to focus your limited resources. Dashboards help us to proactively focus on a Revit projects performance and increase team happiness

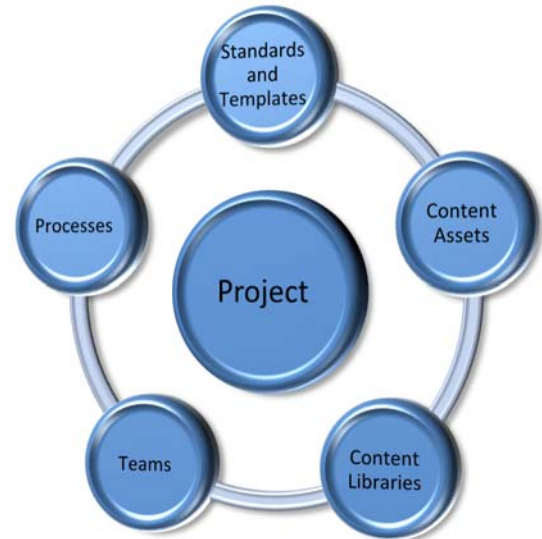
Dashboards

Look at different points of interest

- File size
- Project data structure
- Elements contained in the project (views, groups, in-place families....)
- Warnings (number, severity)
- Open and Sync times
- Red flag (WAN alerts, 20 mile)
- Hardware info and free space on the disk
- Trends over time
- Additional considerations – connectivity, Revit server and accelerators, cloud

Model dash boarding is the beginning of the conversation, not everything can be gleaned from dashboards.

Some **tools** to help you in **data collecting** are:



- CTC Datasuite + PAL- plugin
- Clarity+Plugin (can also run Macros or Dynamo). Clarity dashboards.
- RTV + Macros +Dynamo. Dynamo can collect information about what is in the files
- Unifi plugin
- Custom plugins to capture events
- Harvesting, parsing and analyzing journals and slogs
- Manual Macros and Dynamo

Data collected by these tools can be then uploaded into the database, or on a smaller scale, you can process the data using business intelligence application such as Power BI, Tableau or even Excel.

When planning your dashboards, in addition to data collection and processing, you will need to think about delivery of the right amount of information to the right people just in time.

Perkins+Will has several complimentary dashboards delivered to desktop or a mobile. At Perkins + Will we use Dashboard that show trends, which can allow you to be pre-emptive.

DEMO.

Some known **offenders for Revit performance** are

- Un-necessary views
- Model Groups
- View clipping depth
- Any warnings that have to do with rooms (walls overlap, walls and room separation lines overlap, any room bounding elements overlap)
- Elements affecting room calculations

There are also outside factors such as resource hungry apps that may be running on the machine that can affect your performance. You should look for variations and hardware and software, different build numbers.

You should consider your organizational structure to design an **alert system** most efficient for your situation.

It may include

- In- project: view setups like schedules, and performance gages
- helpdesk ticket systems which may generate emails
- Windows Alerts
- Slack channels

Revit corruption

Corruption can stop a project in its tracks is. We are constantly fighting corruption. There are many types of Revit corruption. Perhaps the most effective tool to help is the Journal file after an Audit. It is also a good idea to proactively collect (and even parse) journal files so when the corruption happens, you will be well equipped to start your analysis rather than try to figure out where the journal files of different team members might be. After corruption has been repaired, use Bluebeam to compare PDFs of all sheets generated before and after repair. We in Perkins+Will collect all journal files nightly from all user profiles.

Known corruption	Diagnostic
Project (template) went through many upgrades	Journal from audit will reveal file life story
Family separation issue	Journal from audit - search for “reload”

Sources Revit 2015, Copy/Paste between projects	ADSK Some families have become unusable
Missing elements issue (threshold) - recurring	Suspects- connectivity, and family separation issue Journal from audit - search for “missing”. Threshold
Locked .SLOG or .dat	usually network glitches - working through WAN or using Nasuni or similar
Elementstream and Missordered container and other gobbledygook	Send to ADSK with journals. Pray.

Templates

Good templates are the start of a healthy project. Revit templates establish foundation that project teams need to collaborate and build their workflows. At a minimum, templates must include foundational standards like graphics, line styles, line patterns, text styles, dim styles, arrows tags and annotations.

Minimum standards for compatibility reasons are:

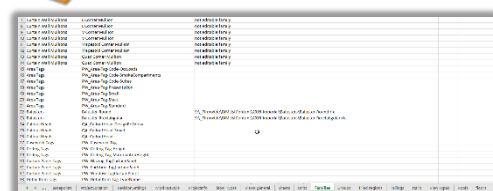
- line weights
- user subcategories
- shared parameters

When planning your templates, think about what is the best fit for your office or organization? Here are some questions you may need to consider

- How often to rebuild them?
- Size of your template? Is it an all-encompassing Big Kahuna or is it a Lightweight agile template?
- Do you custom build templates, per project, for the office or each market sector?
- Do you automate the templates customization?
- Do you have any ways to document and monitor your templates?



Goodie bag. In the class files, you will find a macro for documenting your templates. The Macro extracts information about almost everything you need to

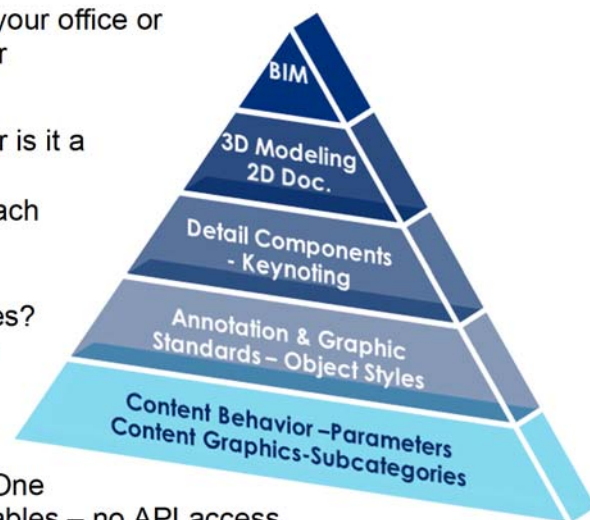


know about your

template into Excel file. One

exception is line weight tables – no API access.

You can plug the results into Power BI for further analysis to compare your templates and/ or see how far your current projects strayed from the initial template and learn from the results.

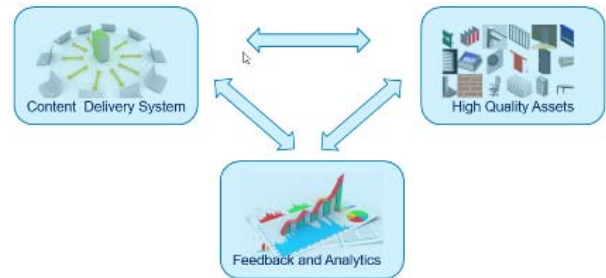


At Perkins+Will we rebuild periodically one base template, and then use it as a starting point to build many flavors as needed for out multiple offices and market sectors. To share knowledge and still be consistent, we add popular workflows to firmwide PLUS templates, then each office builds on this base. Periodically we will run reports and do a baseline comparison. We try to learn from successful projects and publish best workflows.

Revit Content and Libraries

Once you have decided on a template you have to think about high quality content, which is easy to find and maintain. There are three major parts to good content management systems:

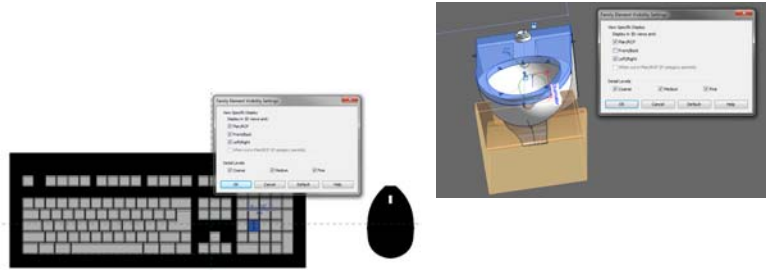
- High-quality assets
- Good content delivery systems
- Feedback and analytics.



To maintain quality assets you often need to process and clean families.

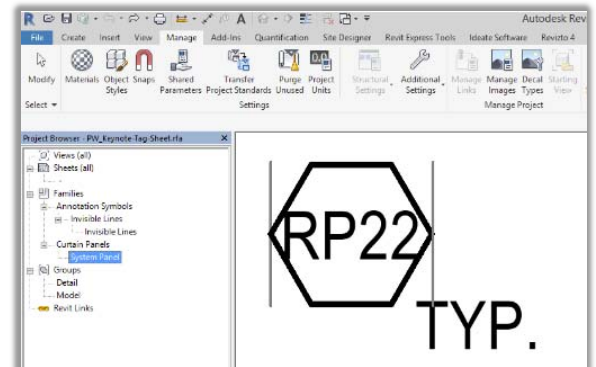
You are looking to filter out toxic elements

- Broken families - crash
- Families with imports
- Families with warnings
- Miss-categorized
- No 3D when expected
- And JUST broken /over-modeled



Other considerations when cleaning families

- Nesting
- Sharing
- Parameters (shared and not, Instance and Type)
- User subcategories
- Materials- parametric or by category
- Unused purge-able stuff
- Unused not purge-able stuff (line patterns, empty subcategories, etc.)



There are many tools on the market to help clean families.

- Perkins+Will utilizes several techniques and tools to clean and process families.

1. The first step is **In + Out**.

Create a template from – None and batch load families, then batch export families.

We use **CTC Family Exporter and Family Importer** tools **or JOTools Mass save and Mass Load**.

You can also use and Export to Library and drag and drop from File Explorer to Revit project. Corrupted families will glitch out, and families with broken constraints may generate warnings. You may end up with more families out than initially went in – because of shared nested content.

2. The second step for us is usually **BIM Helper** Library Analysis.

The result is a concise report, documentation of nesting and sharing and other indicators, which

allow us to set priorities for publishing and clean up.

3. Depending on what we find in the triage report produced by Library Analysis, we may use other tools:

CTC Revit Express Tools – BIM Manager Suite

- Family Processor
- Family Tools

Iconic BIM

- **Guardian** (New Kid on the block) and
 - **P.I.G** – to generate good previews.
- Be aware that Iconic BIM Tools may inject its own information using Extensible storage element.

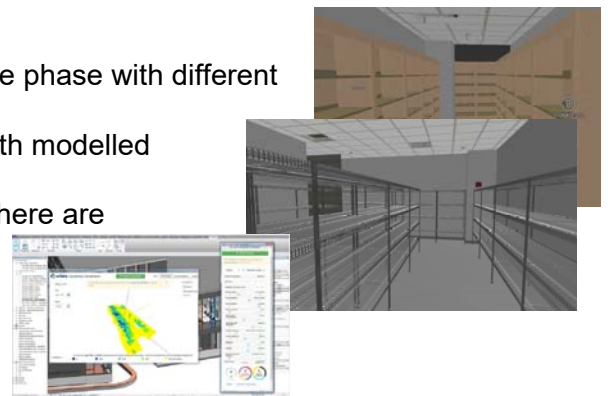
When it comes to Revit assets **other than loadable families**, it is best to develop them in a container consistent with your template. Your distribution system needs to handle:

- System Families “Sandwiches” (walls, roofs, floors....)
- Other system families (stairs, railings, ramps....)
- Schedules
- Drafting views
- Sheets with drafting views
- Legends and sheets with legends and drafting views(Wishful thinking?)

These elements can bring other undesirable contamination such as hatch patterns, text styles, project parameters – Guardian and/or a macro report generator will help you to combat the pollution.

You also have to keep in mind transformation of expectations

- Content data for documentation can change through the phase with different levels of LOD.
- When it comes to clash detection, you need families with modelled clearances.
- For visualization, virtual reality and augmented reality there are expectations for realistic materials.
- There are thermal and daylighting tools used for analysis that would require these assets to contain specific parameters and information



You need to think and plan for non- disruptive workflows where you can swap families as your project develops without having to manually replace them. The keys to that are

- consistent parameters (geometry)
- consistent subcategories
- consistent insertion points
- parametric or by category materials

- Hosting
- Sharing and nesting, etc.

After you develop good assets, you need to deliver that content in an effective and efficient manner. When planning your content delivery system you must think about the perspective of different stakeholders.

Interface

- Intuitive, dock-able/floating, constant presence
- Search and sorting features
- Approved and not approved content
- Loadable and system families, drafting views, schedules, legends, sheets
- Multiple libraries/packages with global and granular search
- Drag and drop
- Good previews



Workflows

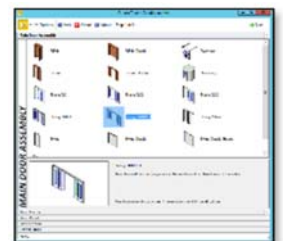
- Content request tool
- Content publishing process- with approval
- Source, author(s) and approver(s)
- Content rating system

From a Content manager's perspective

- Security and version control - granular
- AD Integration
- Reporting - usage, user feedback, assets performance, etc.
- Metadata
- Type catalogs
- Content grouping and multi-grouping. Packages.
- Pull – Approval - Reject process
- Content harvesting and submission process

You should also consider business issues.

- Cost and licensing.
- Cloud versus WAN.
- Installation and scalability
- Access to internal and external content (managed)
- Migrate out of the system issues (pre-nup)
- Flexibility in adding more features.



You may also look into **content factories**, like CTC SuperDoor Tool and others

**Goodie bag:**

- [Link to public Trello board](#)
- scripts for working with lists if files and trees are included with session materials.

Project Teams

Perhaps the most important part of project success is the team. There could be a lot of different software used on any project, however Revit is a very team oriented environment. It is important to understand staff's Revit skills and have a way to assess, monitor and elevate these skills.

Three different aspects that can guide you in planning and delivering the most efficient training are:

Institutional

- How many years of Revit practice in your office
- Type and scale of projects
- Proprietary workflows. Staff turnover

Individual

- To plan group or individual training
- OOTB assessment tools
- Self – assessment
- BIM Manager assisted assessment
- Part of hiring/onboarding process?
- Keeping it current – update as users skills develop
- Support from top

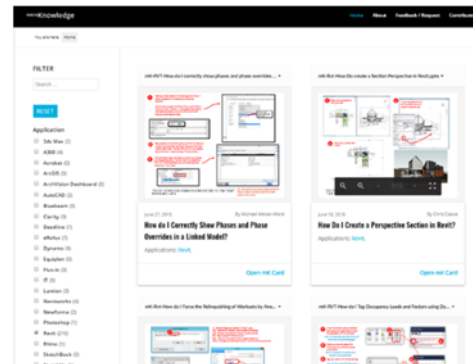
Team skill assessment for a project

- To form functional teams based on project tasks
- To plan JIT (Just In Time) training for teams

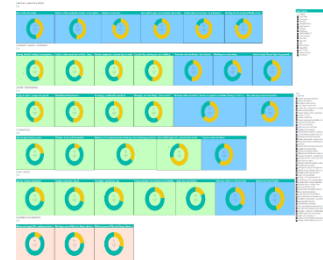
Perkins + Will is in the mature BIM phase where we have built high level of institutional knowledge. Our ongoing Revit training focuses on filling the gaps, promoting best workflows and keeping the skills sharp.

Perkins + Will Training

- On-boarding
- Skill assessment + training as needed
- PW processes
- PW resources
- P+W Revit Project Guide
- Lynda.com
- P+W microKnowledge site – bite size
 - multiple apps
 - FAQ, best practices, workflows (see Dan Chasteen's class)
- Monthly Digital practice Newsletter
 - New technology
 - Sharpen Your Tools
 - I Know What You Did in Revit



To focus our effort on **where it is most efficient**, we have developed a process of forming functional teams where we match the teams' skills to the projects' needs. It is based on a Revit skill matrix that each team member updates as they learn new skills. It allows to quickly evaluate the whole team and plan JIT training. Of course, the most challenging part of it is to update every member information.



Project Teams

Every office or company is a unique environment, and you need to be able to evaluate what works best for your company based on your situation. We shared some thoughts, tools and techniques to help you in balancing your own unique Revit ecosystem.

