Balancing Revit Ecosystem

Helen Gorina

Digital Practice Manager

Christopher Coscia

Design Applications Manager

PERKINS + WILL



About the speakers



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. Highly skilled 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 for efficient project delivery



Christopher 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.

We are happy to see you! Are you in the right class?

SESSION DESCRIPTION

Projects, templates, and content requires BIM Managers to connect the dots playing several roles:

Researcher - collecting and analyzing performance of Revit projects

Investigator - uncovering underlying problems

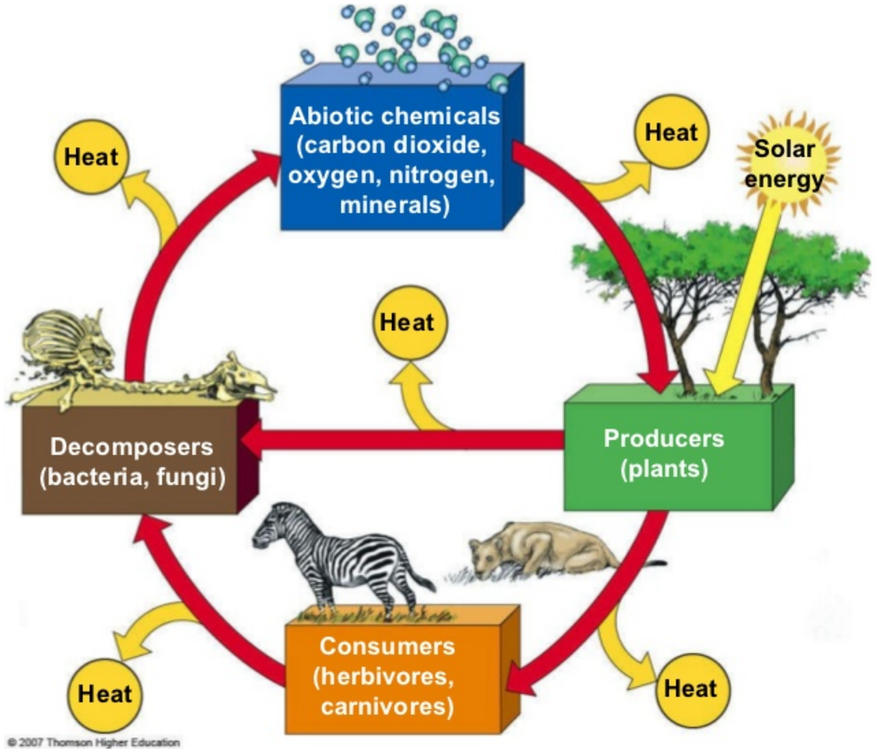
Janitor - facilitating fixes

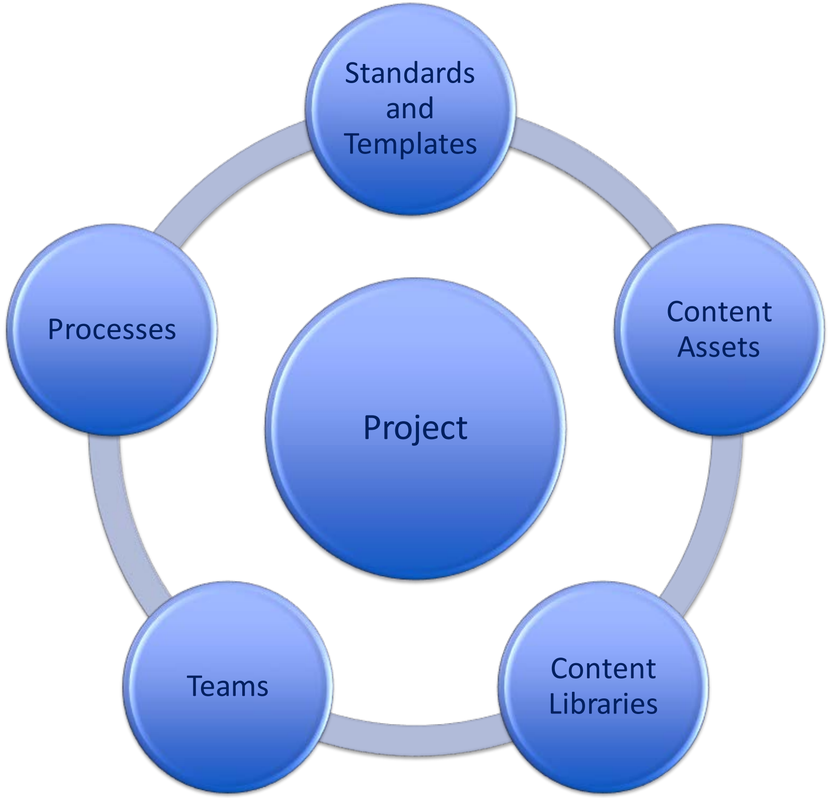
In this class we will take a deeper look at Revit ecosystem as a whole - and how to keep it in balance.

We will clamp down on usual suspects and focus on automation of reporting and cleanup.

LEARNING OBJECTIVES:

1. Learn how to collect and analyze key performance indicators of your Revit models and projects
2. Learn how to uncover real reasons behind poor Revit performance and create practical plan of addressing the issues
3. Explore tools available for tuning up your Revit ecosystem - active projects, templates and content
4. Better understand staff training needs and focus training effort





Revit Ecosystem

Revit Project KPI
Team happiness with Revit performance

- Open and Sync time
- Navigation and editing speed
- Ease of management (content, detailing, visibility, schedules, QA procedures, etc.)



How to Achieve Happiness

- 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

Monitor and Forecast Happiness - Know Where to Focus

For tapping the valve: $1.00

For knowing where to tap: $999.00

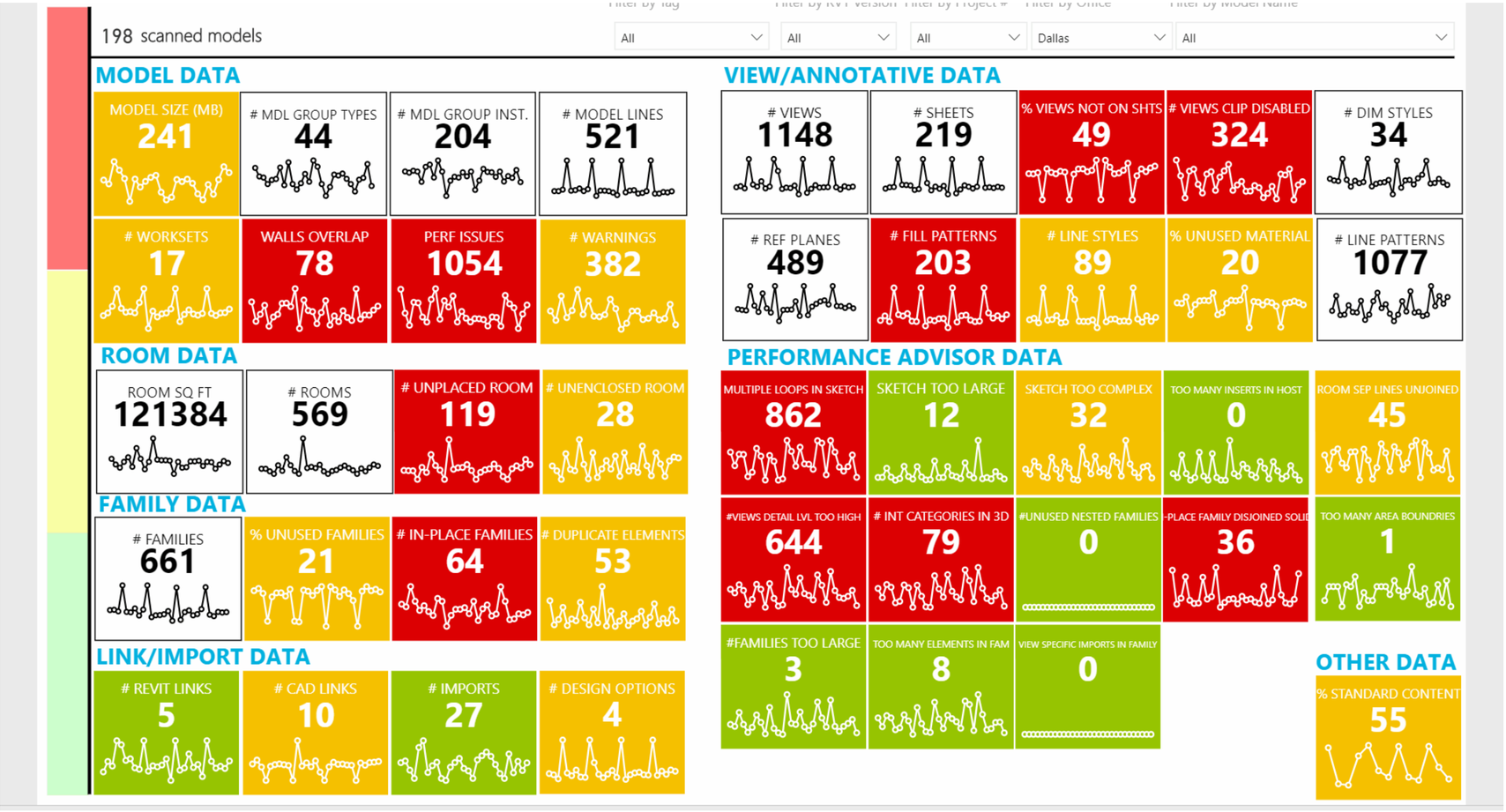
TOTAL: $1,000.00



Revit Project



Project Dash Boarding in Perkins+Will



Power BI – Josh Moore

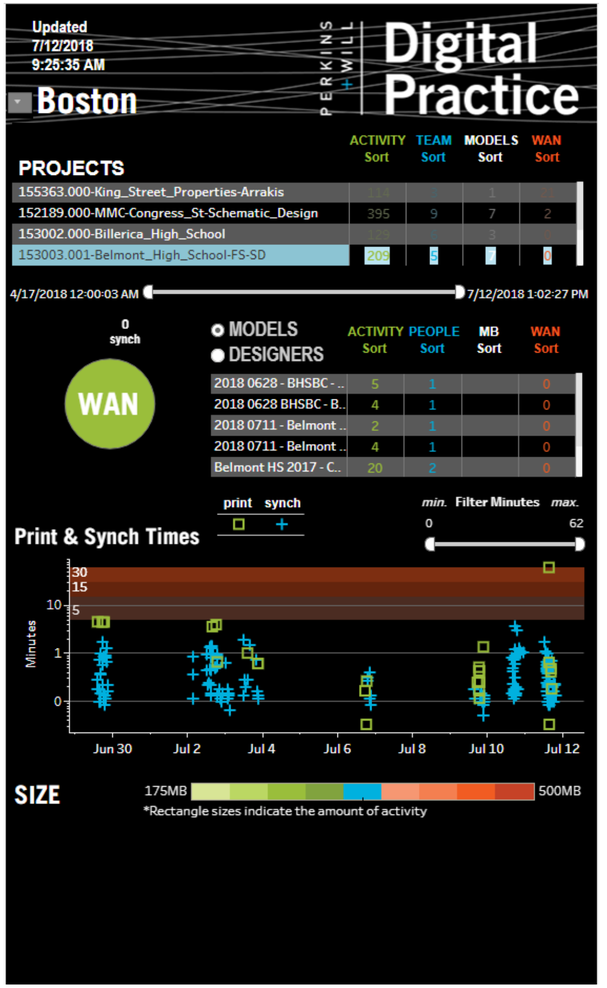


Tableau – Dan Chasteen

Project Dash Boarding

Points of Interest	When to collect

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time
Warnings (number, severity)	Collect at off-time.

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time
Warnings (number, severity)	Collect at off-time.
Open and sync times	Collect/log as team is working (plugin) or from journals/slogs at off time

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time
Warnings (number, severity)	Collect at off-time.
Open and sync times	Collect/log as team is working (plugin) or from journals/slogs at off time
Red flag issues (WAN alerts, 20 mile, etc.)	Best to collect and notify immediately

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time
Warnings (number, severity)	Collect at off-time.
Open and sync times	Collect/log as team is working (plugin) or from journals/slogs at off time
Red flag issues (WAN alerts, 20 mile, etc.)	Best to collect and notify immediately
Hardware info and free space on disk	Collect at off-time

Project Dash Boarding

Points of Interest	When to collect
File sizes and project data structure	Plan and document. Collect at off-time
Elements contained in the project: views, groups, in-place families, etc.	Collect at off-time
Warnings (number, severity)	Collect at off-time.
Open and sync times	Collect/log as team is working (plugin) or from journals/slogs at off time
Red flag issues (WAN alerts, 20 mile, etc.)	Best to collect and notify immediately
Hardware info and free space on disk	Collect at off-time
Additional considerations – connectivity, Revit server and accelerators, cloud	Collect/log as team is working

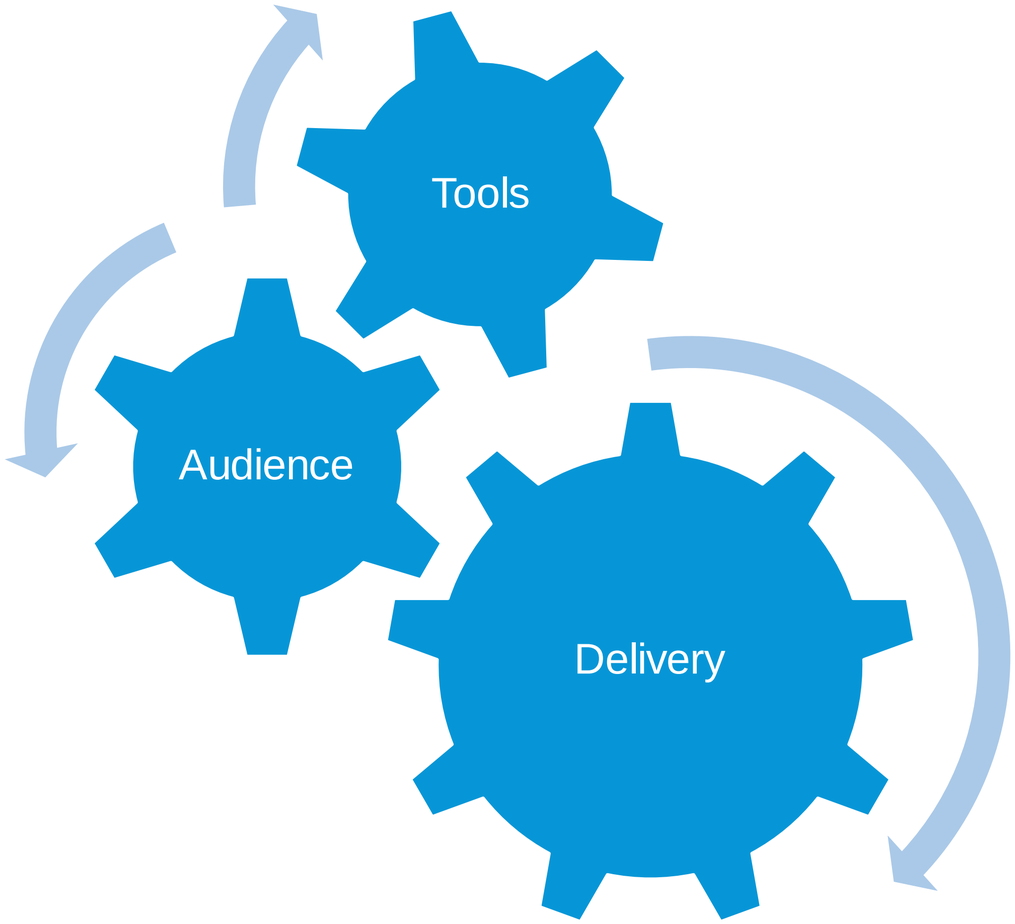
Project Dash Boarding - Tools for Data Collection

- CTC Data Suite PAL (Project Activity Logger)
- ImaginIt Clarity+ Plugin (Clarity can also run Macros or Dynamo)
- RTV + Macros or Dynamo. Can collect information about what is in the files.
- Unify – sync times, and more
- Custom plugins to capture events
- Harvesting, parsing and analyzing journals and slogs
- Manual Macros and Dynamo

All your sources should feed into a database

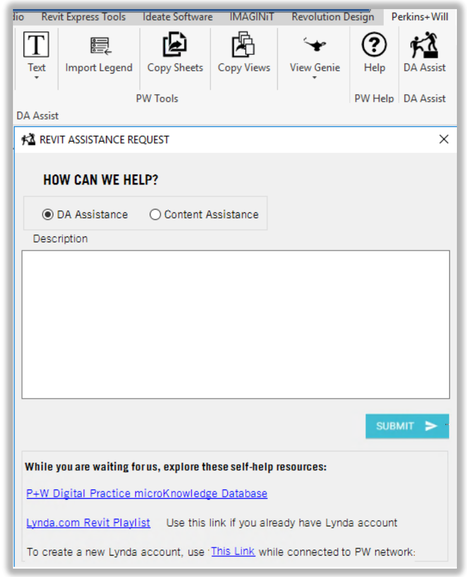
Project Dash Boarding - Presentation and Visualization

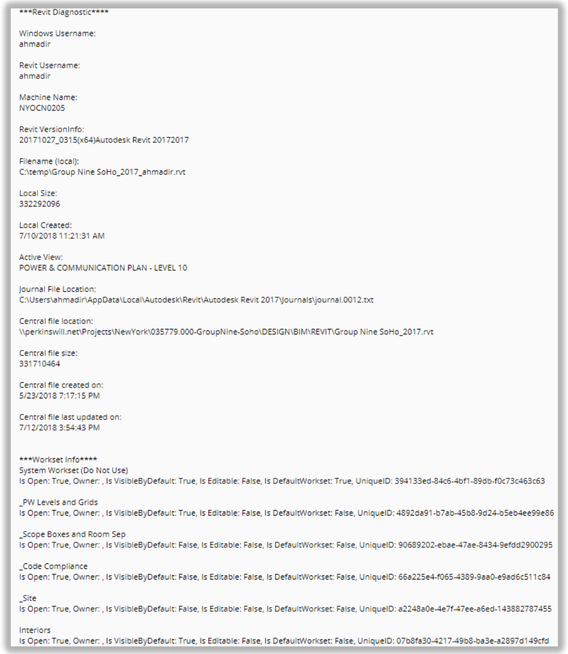
- Audience
  - Project teams
  - BIM Managers
  - Project Managers and up
- Delivery
  - Desktop
  - Mobile
- Tools
  - PowerBI
  - Tableau
  - Excel
  - OOTB solutions – Clarity, CTC
  - Others?

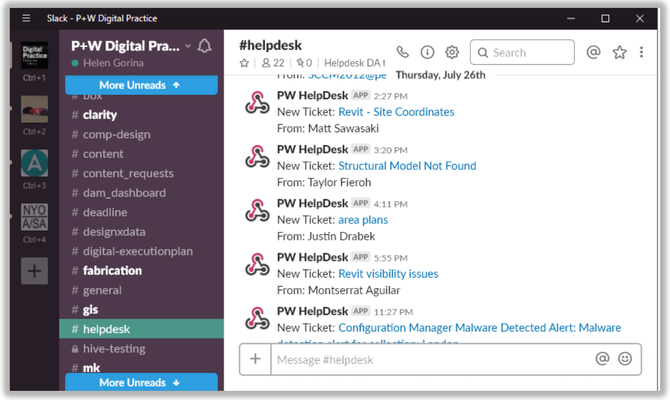


Active Alert Systems - Who is Listening?

- In-project views (schedules, parametric family “gauges”, etc.)
- Helpdesk ticket (with additional diagnostic info) or emails
- Windows alerts
- P+W: Dashboards + DA Assist Tool + Helpdesk + Slack channels







Usual Suspects

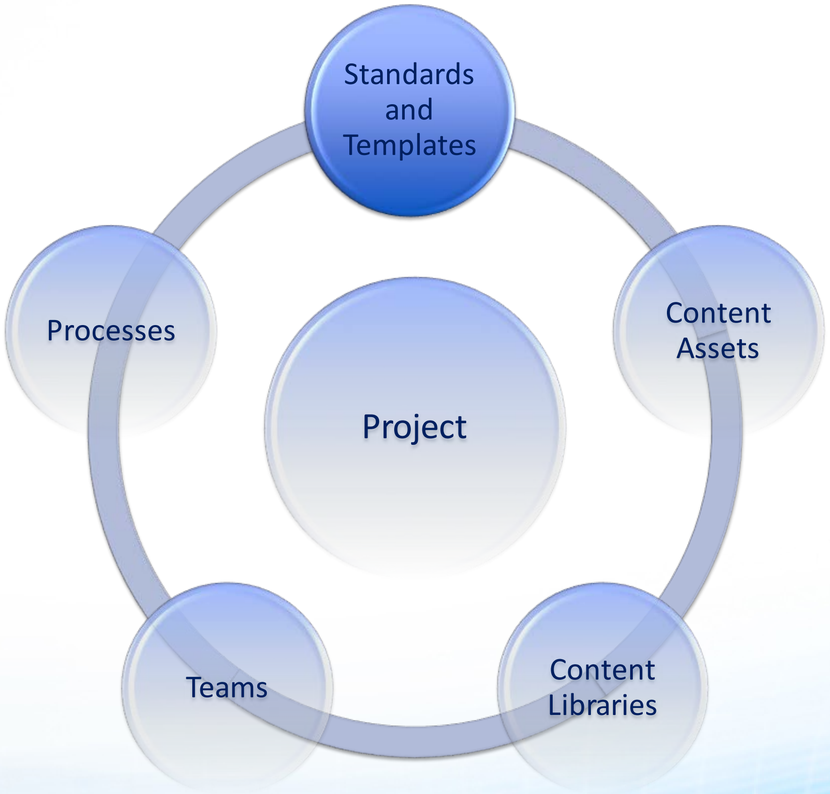
- Known Performance hogs for Revit
  - Unnecessary views
  - Model Groups
  - Room Volume Calculations
  - View clipping depth
  - Any warnings that have to do with rooms (walls overlap, walls and room separation lines overlap, any room bounding elements overlap, walls or room separation line are slightly off axis) http://archi-lab.net/wp-content/uploads/2017/01/S03_Handout_LAB_YouvebeenWarned_H_Gorina.pdf
  - Elements affecting room calculations
- Other resource hungry apps running on machines – rendering, etc.
- Variation in hardware, free space on drive, video drivers, windows platform and updates, Revit builds and plugins – can also cause corruption…

What is Your Vice? Fighting Corruption

Known corruption	Diagnostic
Family separation issue Sources Revit 2015, Copy/Paste between projects	Journal from audit - search for “reload” ADSK Some families have become unusable
Missing elements issue (threshold) - recurring	Suspect- connectivity Journal from audit - search for “missing”. Threshold
Locked .SLOG or .dat	usually network glitches - working through WAN or using Nasuni or similar
Project (template) went through many upgrades	Journal from audit will reveal file life story
elementstream and missordered container and other gobbledygook	Send to ADSK with journals. Pray.

- Export all families – automate or manually so you can reload them later – many tools available
- Collect user journals proactively. Journals from Audit are more revealing.
- PDF all sheets often so you can compare (Bluebeam) after file is repaired by Autodesk

Revit Templates



Project Templates

HOW OFTEN DO YOU REBUILD?

LIGHTWEIGHT TEMPLATES VERSUS BIG KAHUNA?

CUSTOM BUILD TEMPLATES PER PROJECT, OFFICE, MARKET SECTOR?

AUTOMATED CUSTOM TEMPLATES?

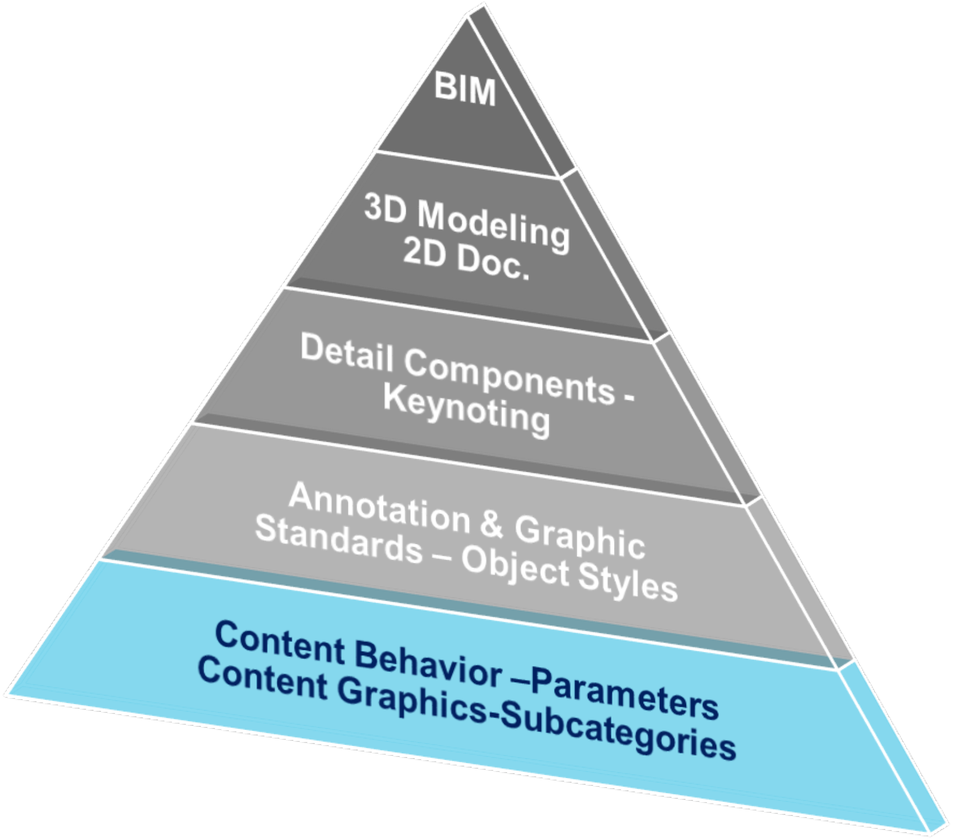


Project Templates in Perkins+Will

- PERIODIC REBUILD
- ONE BASE, MANY FLAVORS
- LEAN BASE AND BASE-PLUS
- SUSTAINABLE MAINTENANCE – PERIODIC REPORTS AND COMPARISON
- LEARN FROM SUCCESSFUL PROJECTS TO PUBLISH BEST WORKFLOWS

Standards Smandards





Foundational standards

- Graphics

  line weight, line styles, line patterns,

  fill patterns ,

  text styles, dimstyles,

  arrows, tags, annotations

  …….

- Non-negotiable for compatibility:
  - Line weight (not exposed in API)
  - User subcategories
  - Shared parameters

Project Templates Reports and Comparison

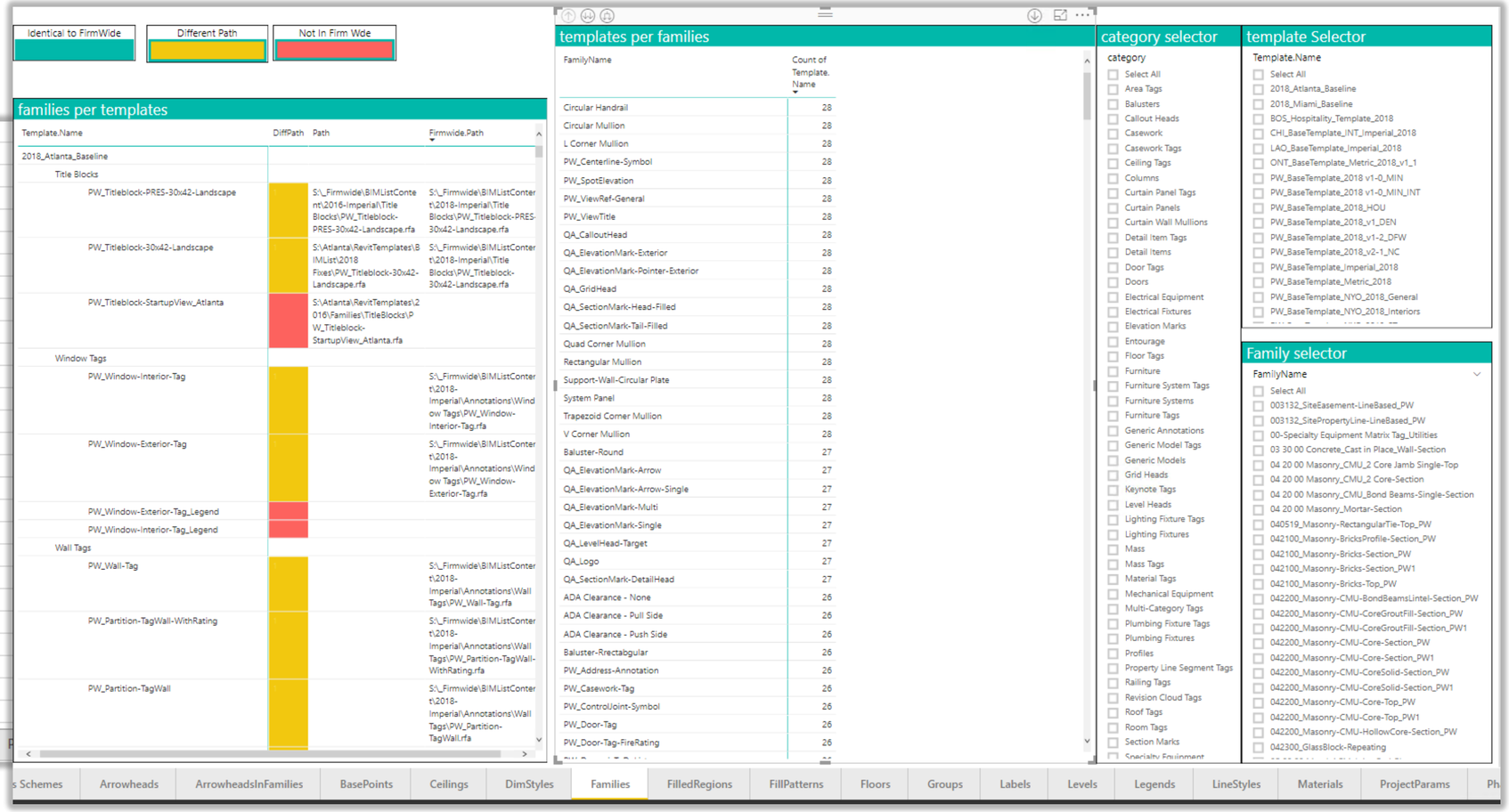
Macro ReporterFull – in session materials



PowerBI comparison demo

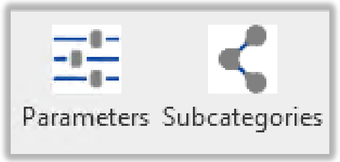
7	Curtain Wall Mullions	L Corner Mullion
8	Curtain Wall Mullions	L Corner Mullion
9	Curtain Wall Mullions	V Corner Mullion
10	Curtain Wall Mullions	V Corner Mullion
11	Curtain Wall Mullions	Trapezoid Corner Mullion
12	Curtain Wall Mullions	Trapezoid Corner Mullion
13	Curtain Wall Mullions	Quad Corner Mullion
14	Curtain Wall Mullions	Quad Corner Mullion
15	Area Tags	PW_Area-Tag-Code-OccLoads
16	Area Tags	PW_Area-Tag-Code-SmokeCompartments
17	Area Tags	PW_Area-Tag-Code-Suites
18	Area Tags	PW_Area-Tag-Presentation
19	Area Tags	PW_Area-Tag-Small
20	Area Tags	PW_Area-Tag-Stack
21	Area Tags	PW_Area-Tag-Standard
22	Balusters	Baluster-Round
23	Balusters	Baluster-Rrectabgular
24	Callout Heads	QA_CalloutHead-DesignRefView
25	Callout Heads	QA_CalloutHead-Small
26	Callout Heads	QA_CalloutHead
27	Casework Tags	PW_Casework-Tag
28	Ceiling Tags	PW_Ceiling-Tag-Height
29	Ceiling Tags	PW_Ceiling-Tag-MaterialAndHeight
30	Curtain Panel Tags	PW_Glazing-TagCurtainPanel
31	Curtain Panel Tags	PW_Partition-TagCurtainPanel
32	Curtain Panel Tags	PW_Window-TagCurtainPanel
33	Detail Item Tags	PW_DetailItem-Tag-TypeName

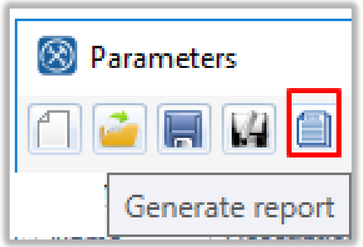
... | Basepoints | ProjectLocation | RevisionSettings | ModTextStyle

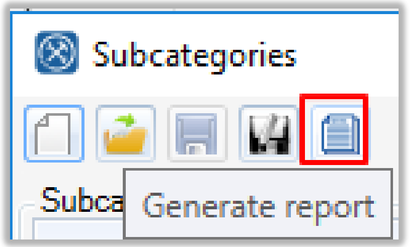


Project Templates OOTB cleanup/rebuild tools

- BIM Helper reporting tools





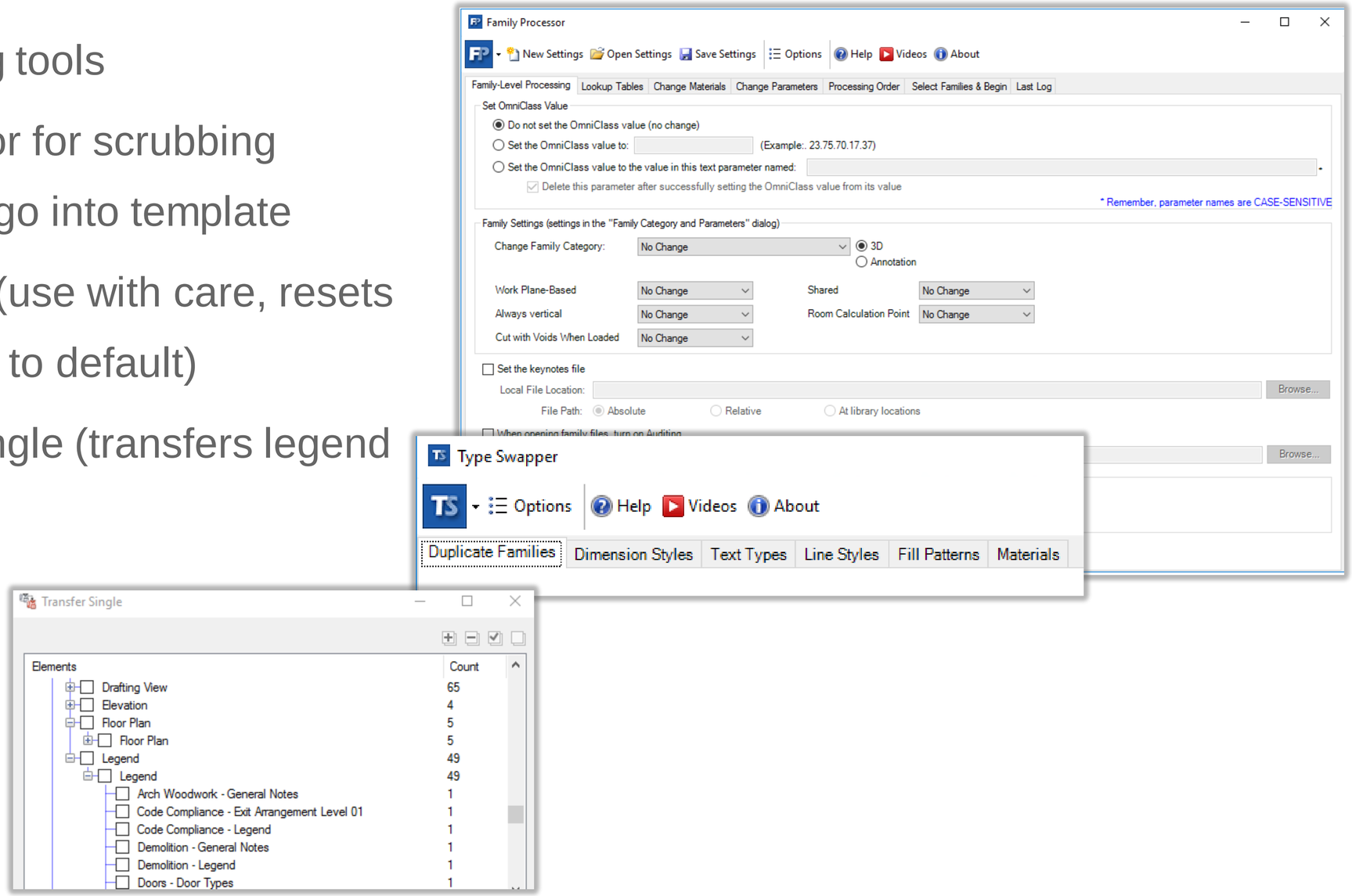


Name	ParentName	Families	Id	Num	IsReadO	AllowBoundsParameter	CanAddSubcategory	HasMaterialQuantities	Mater	IsCuttable	F
Medium Lines	Section Marks	section head - filled, section head - no arrow,	-2000403	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Pads	Site	construction trailer	-2001263	0	FALSE	TRUE	FALSE	FALSE		FALSE	C
Survey Point	Site	construction trailer	-2001272	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Property Lines	Site	construction trailer	-2001265	0	FALSE	TRUE	FALSE	FALSE		TRUE	C
Logistics	Site	construction trailer	1354	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Project Base Point	Site	construction trailer	-2001271	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Property Line Segments	Site	construction trailer	-2001268	0	FALSE	TRUE	FALSE	FALSE		TRUE	C
Hidden Lines	Site	construction trailer	-2009524	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Rigid Links	Structural Columns	concrete-rectangular-column, w shapes-colur	-2001344	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Stick Symbols	Structural Columns	concrete-rectangular-column, w shapes-colur	-2001335	0	FALSE	FALSE	FALSE	FALSE		FALSE	C
Hidden Lines	Structural Columns	concrete-rectangular-column, w shapes-colur	-2001334	0	FALSE	FALSE	FALSE	FALSE		FALSE	C

FamilyName	FamilyType	ParameterGroup	Name	ParameterStorageType	RevitType	ValueString	UnitType
Brick Standard	Rowlock	PG_GEOMETRY	Height/Length	Double	Length	0' - 4"	UT_Length
Brick Standard	Rowlock	PG_GEOMETRY	Joint Thickness	Double	Length	0' - 0 13/32"	UT_Length
Brick Standard	Rowlock	PG_GEOMETRY	Width/Length	Double	Length	0' - 7 5/8"	UT_Length
Brick Standard	Soldier & Plan	PG_GEOMETRY	Height/Length	Double	Length	0' - 8"	UT_Length
Brick Standard	Soldier & Plan	PG_GEOMETRY	Joint Thickness	Double	Length	0' - 0 13/32"	UT_Length
Brick Standard	Soldier & Plan	PG_GEOMETRY	Width/Length	Double	Length	0' - 3 5/8"	UT_Length
Brick Standard	Running Section	PG_GEOMETRY	Height/Length	Double	Length	0' - 2 21/32"	UT_Length
Brick Standard	Running Section	PG_GEOMETRY	Joint Thickness	Double	Length	0' - 0 13/32"	UT_Length

Project Templates OOTB cleanup/rebuild tools

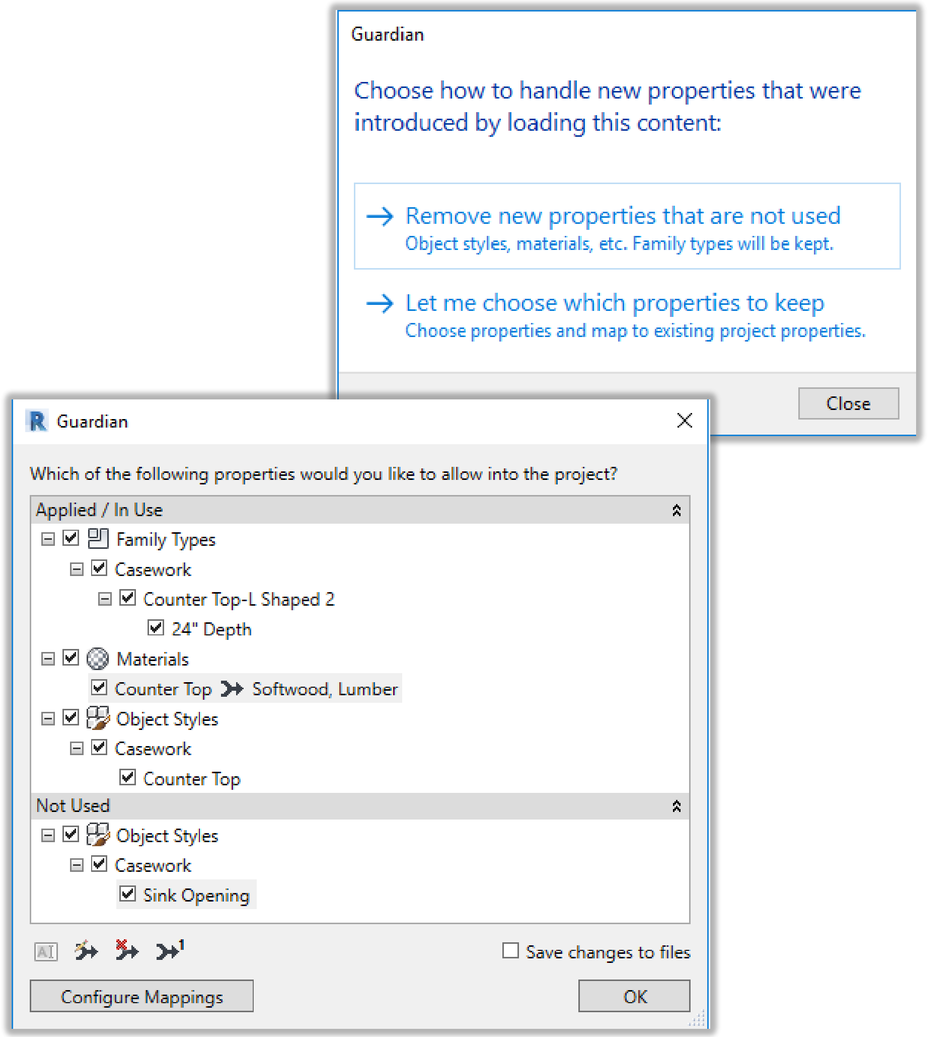
- BIM Helper reporting tools
- CTC family processor for scrubbing families before they go into template
- CTC Type Swapper (use with care, resets instance parameters to default)
- JOTools Transfer Single (transfers legend views)



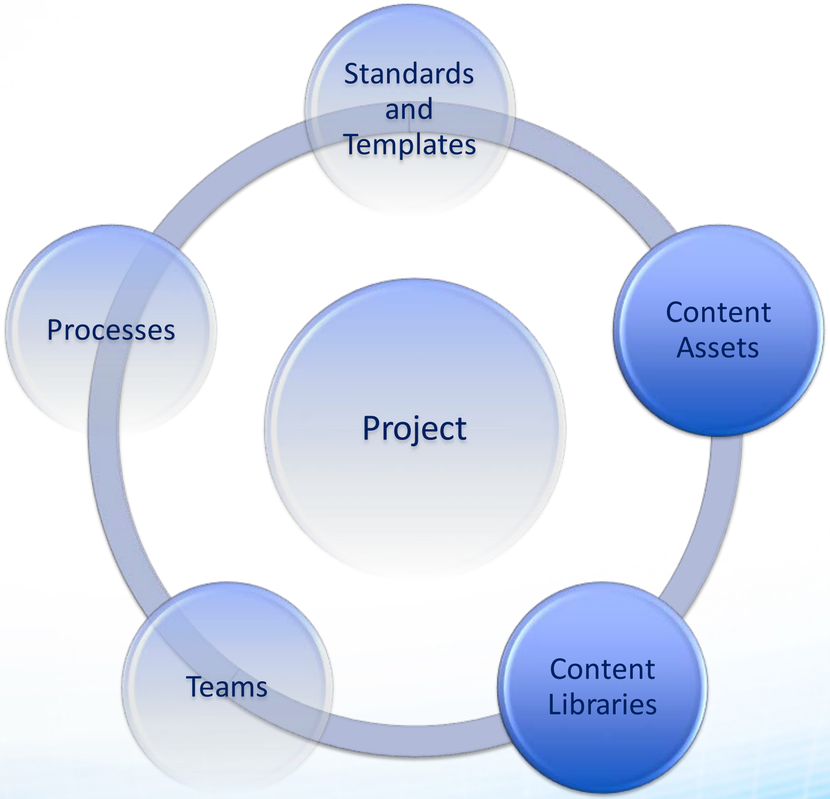
Project Templates OOTB cleanup/rebuild tools

- BIM Helper reporting tools
- CTC family processor for scrubbing families before they go into template
- CTC Type Swapper (use with care, resets instance parameters to default)
- JOTools Transfer Single (transfers legend views)
- Iconic BIM Guardian – new kid on the block

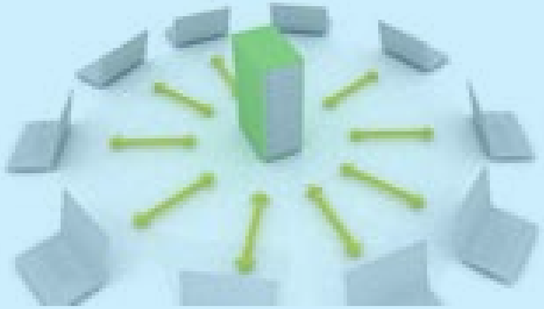
Write your own – Dynamo or Macro



Revit Content and Libraries



Content Management System



Content Delivery System

High quality content which is easy to find and maintain.



High Quality Assets

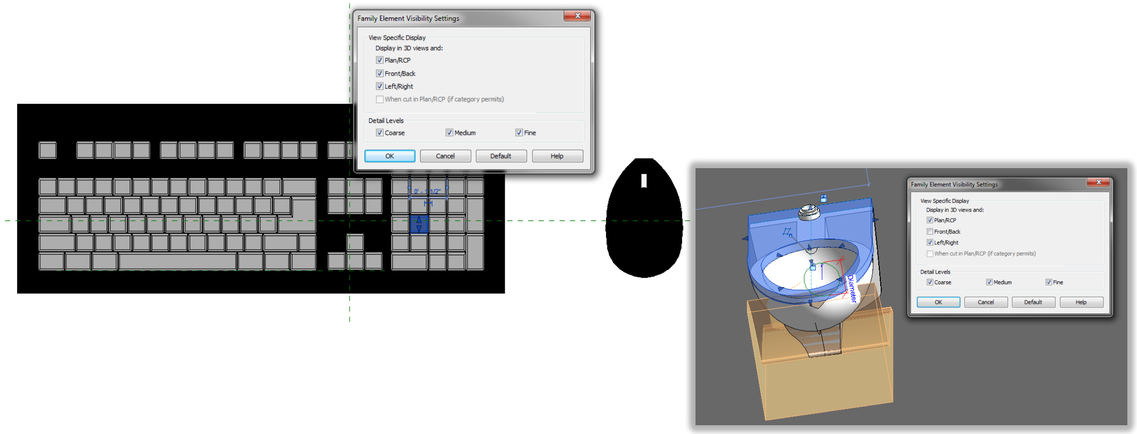


Feedback and Analytics

Revit Assets - Loadable Families

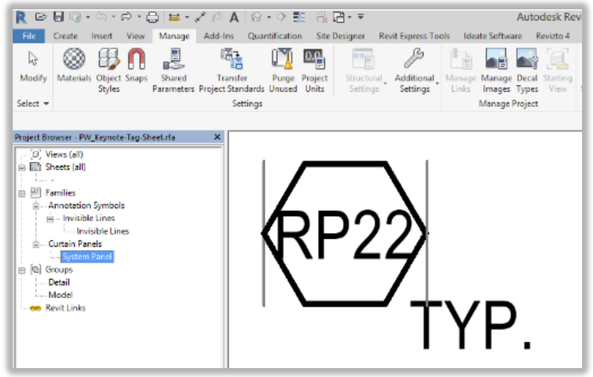
Filter out toxic

- Broken families - crash
- Families with imports
- Families with warnings
- Mis-categorized
- No 3D when expected
- Just broken /over-modeled



Other considerations

- Nesting
- Sharing
- Parameters (shared and not, Instance and Type)
- User subcategories
- Materials - parametric or by category
- Unused purgeable stuff
- Unused not purgeable stuff
  (line patterns, empty subcategories, etc.)
- Open and look for weird stuff



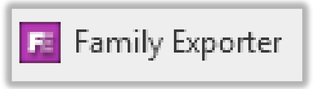
Families Cleanup Techniques and Tools

In and Out

batch insert into the project made from template - none, batch extract, catch any messages

- OOTB- drag and drop into the project, save as a library
- CTC BIM Batch Suite– free Export and Import
- JOTools – free



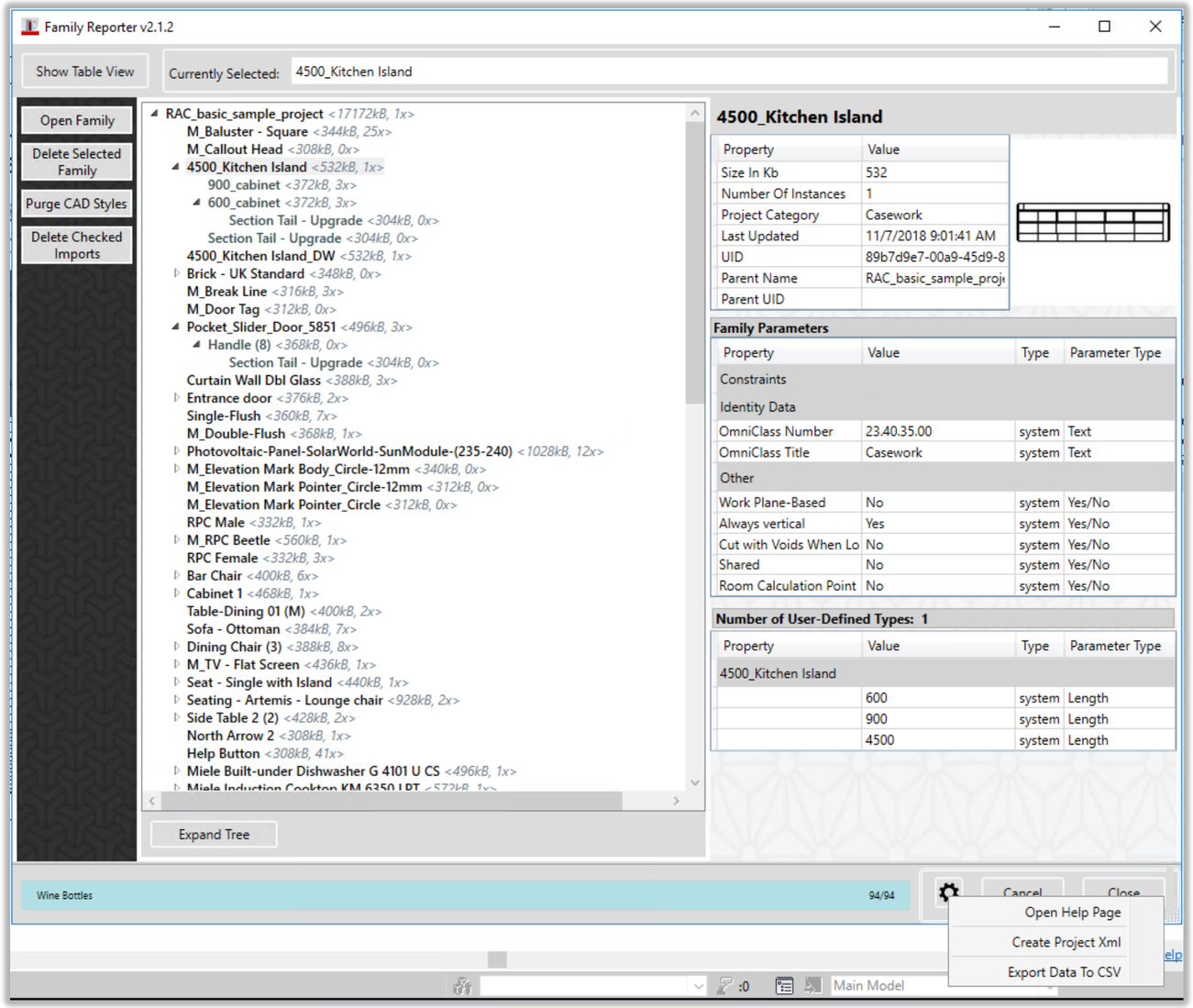




Note:

if you have nested shared families, you will have more extracted than you inserted – do not publish nested components

Families Cleanup Techniques and Tools



Family Size Reporter

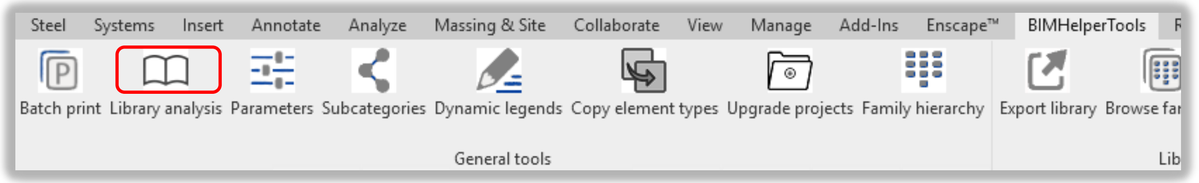
https://apps.autodesk.com/RVT/en/Detail/Index?id=5536917954730046399&appLang=en&os=Win64

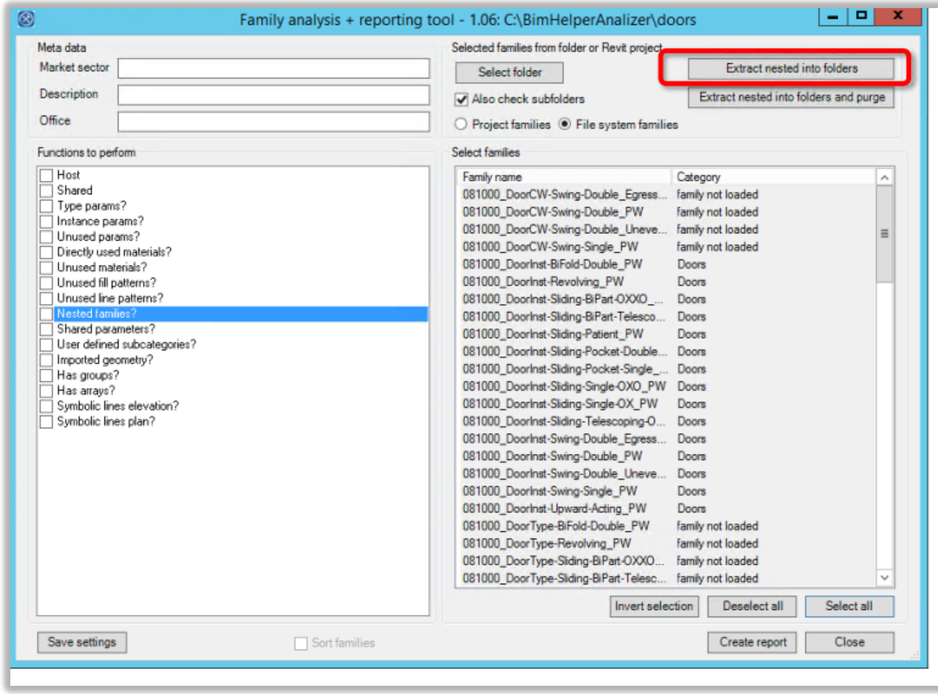
Much more than size!

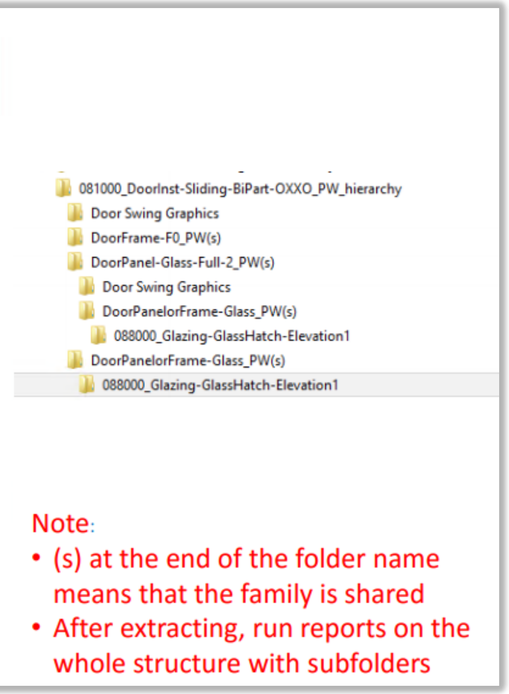
Free- and actively developed

Families Cleanup Techniques and Tools

BIM Helper Library Analysis

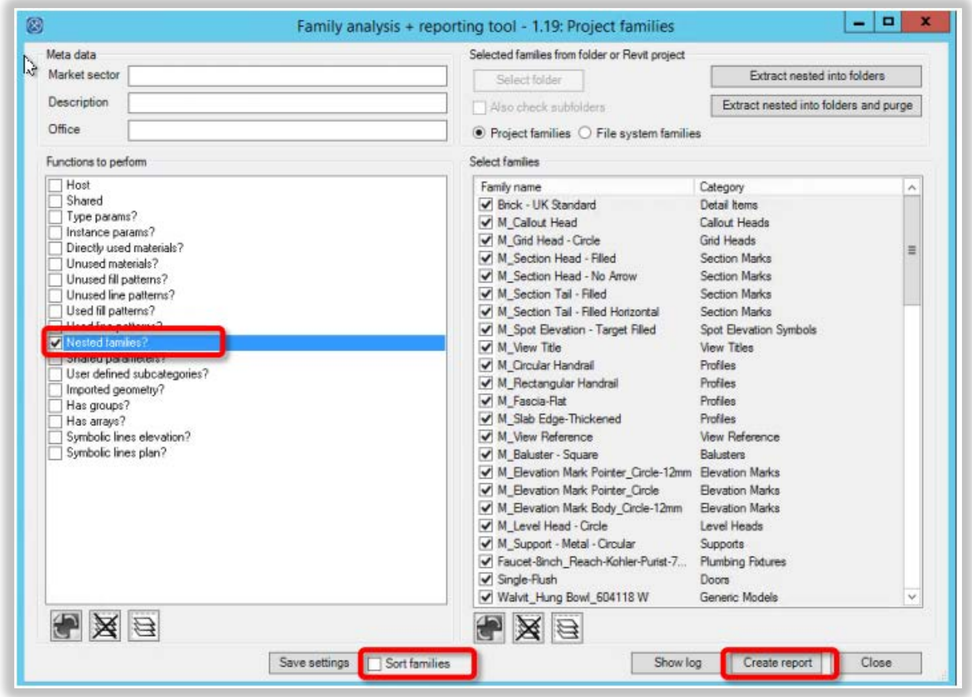






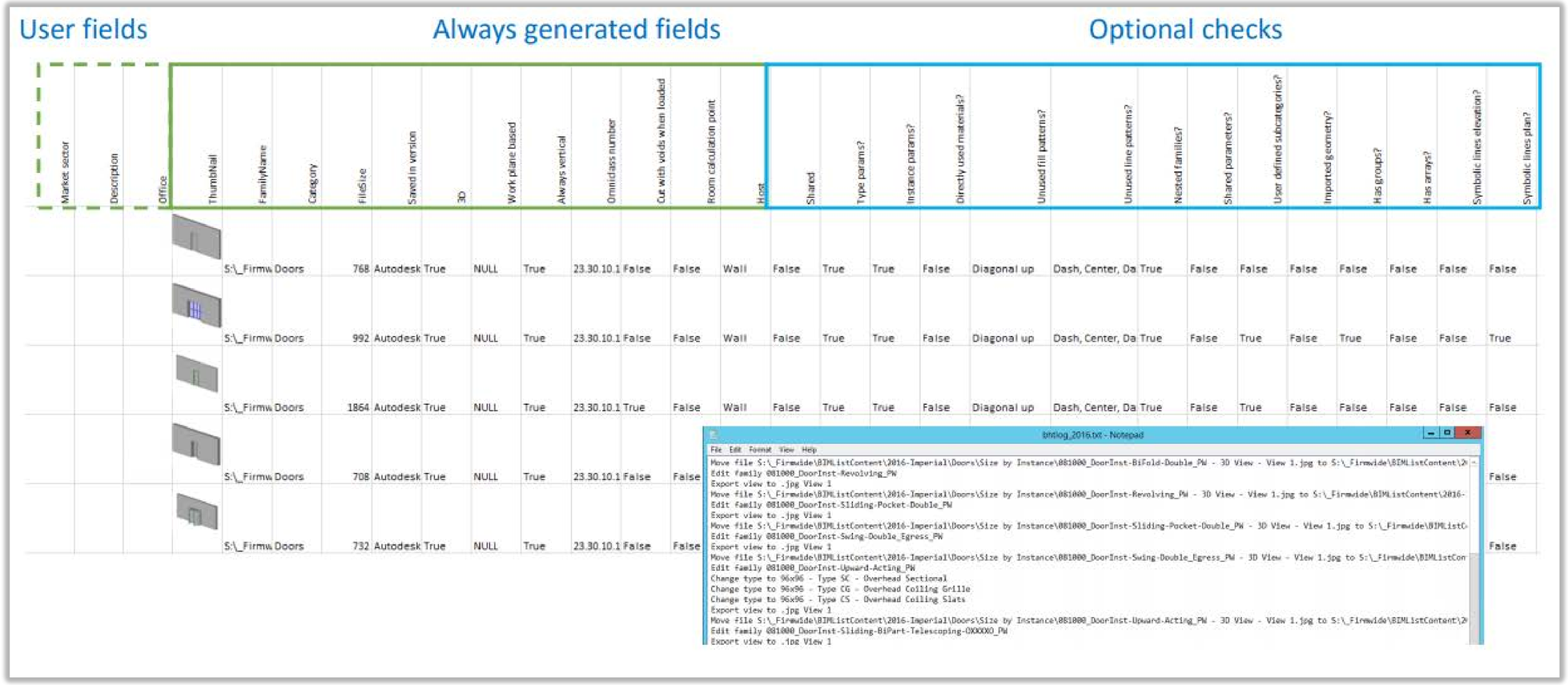
Note:

- (s) at the end of the folder name means that the family is shared
- After extracting, run reports on the whole structure with subfolders



Families Cleanup Techniques and Tools

BIM Helper Library Analysis Report



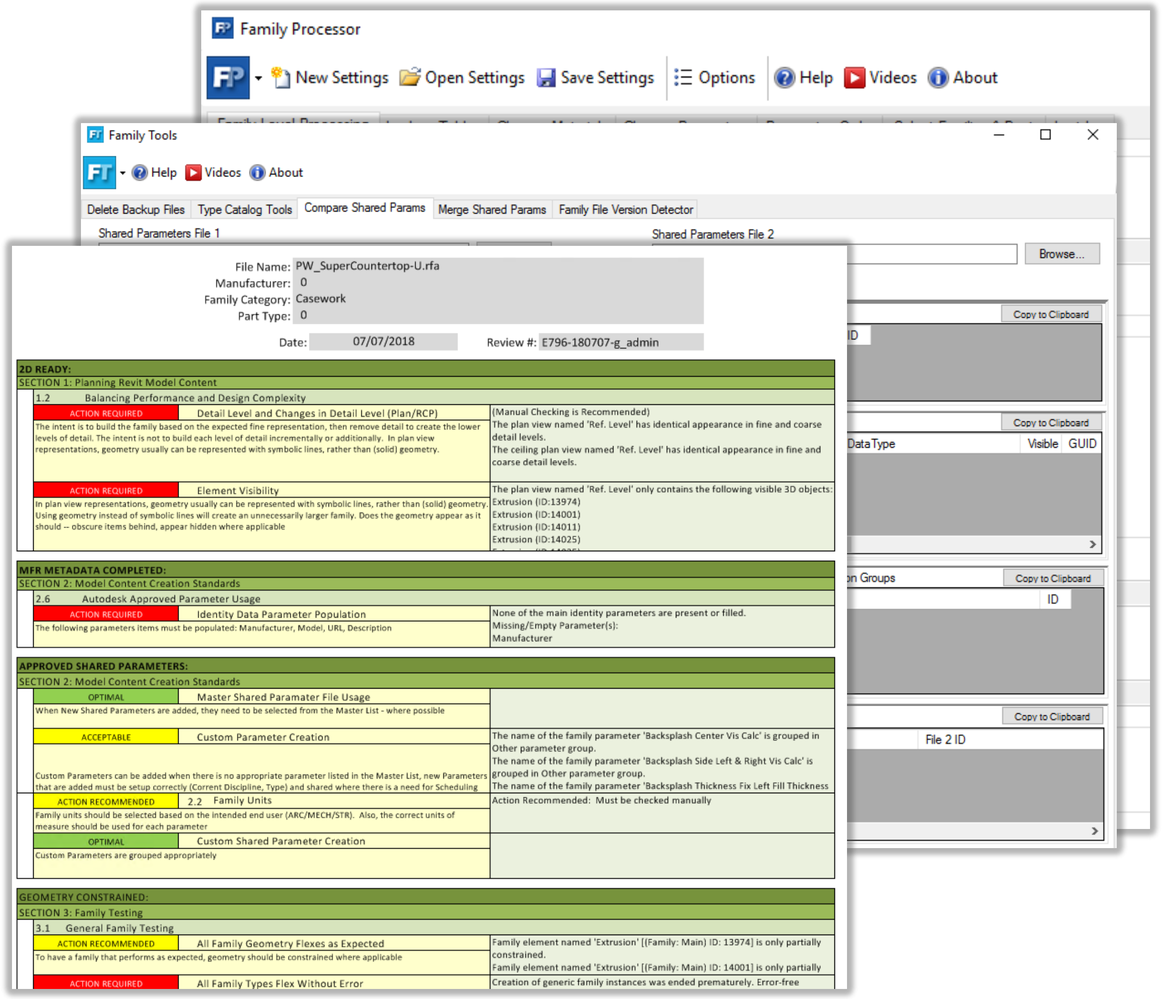


Scripts for working with
file lists and trees

Families Cleanup Techniques and Tools

CTC tools – BIM Manager Suite

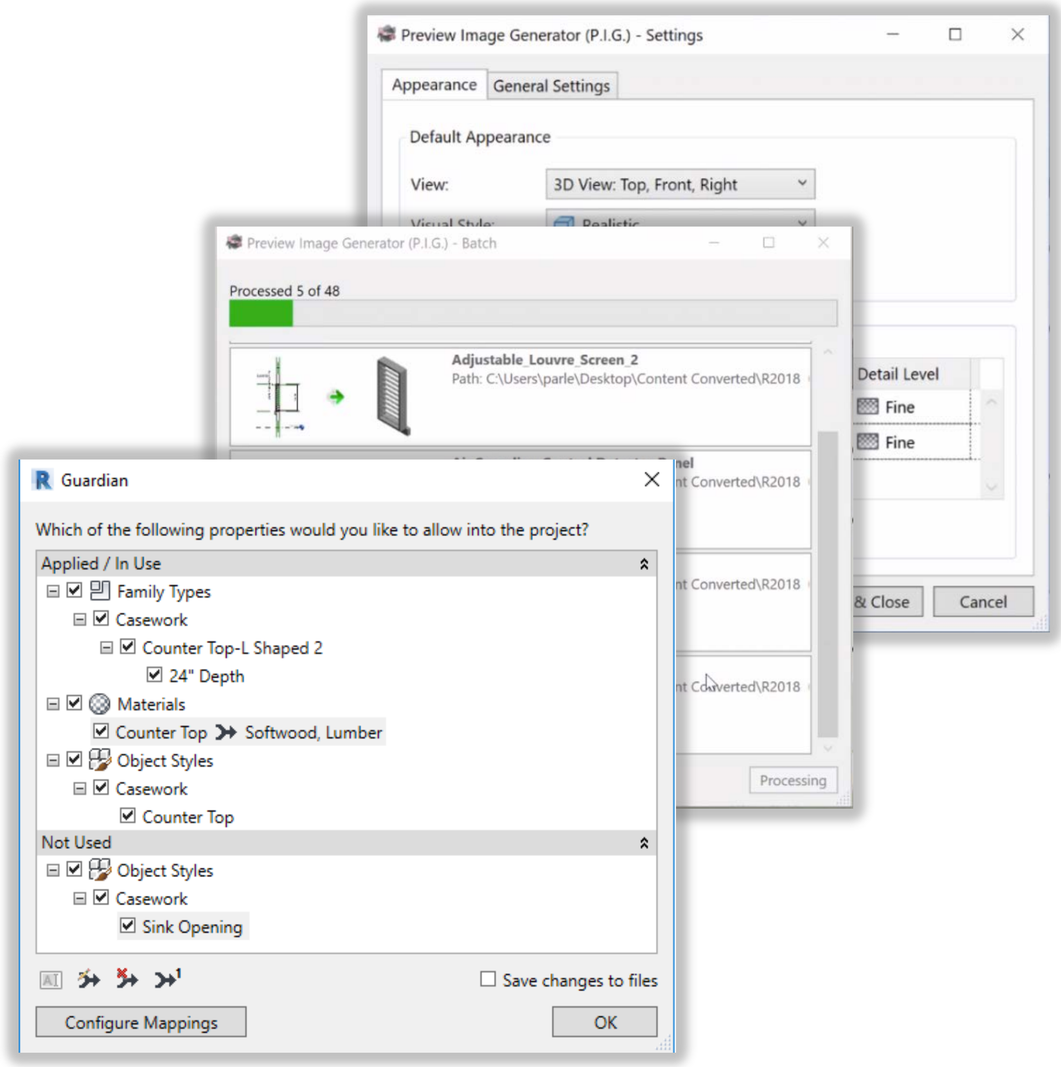
- Family Processor
- Family Tools – free
- Family Checker



Families Cleanup Techniques and Tools

New Tools on the market

- Iconic BIM P.I.G
  - o preview image generator – rule based
- Iconic BIM Guardian
  - o Intercepts additional resources on family load, copy/paste, transfer project standards…



Macro for batch generating clean previews of 2D families

Other Distributable Revit Assets



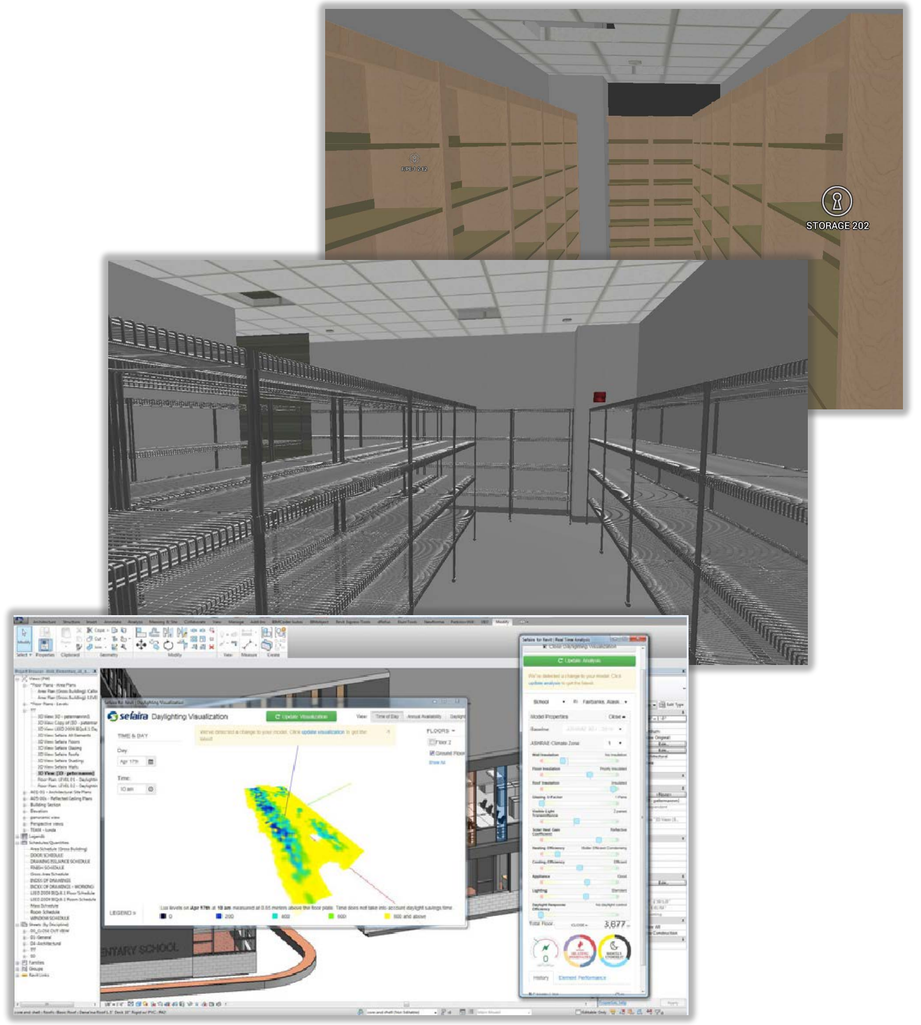
- System Families “Sandwiches”
  - Walls, roofs, floors…. Use ReporterFull macro to document all layers
- Other system families
  - Stairs, railings, ramps, etc.
- Schedules
  - Bring parameters on insertion
  - Bring text styles
- Drafting views
  - Standard details
  - Hatch patterns
- Sheets with drafting views
  - No title block – maybe just a border
- Legends and sheets with legends and drafting views
  - Use JOTools Transfer One (P+W has custom tools)
  - May bring families – use CTC Type swapper to cleanup (watch for instance parameters)

Develop in container(s) congruent with your template

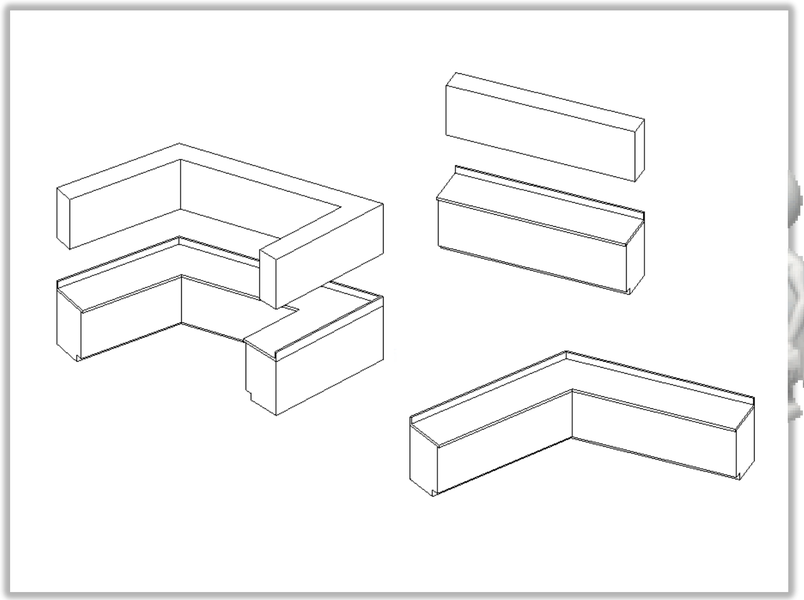
Assets – Transformation of Expectations



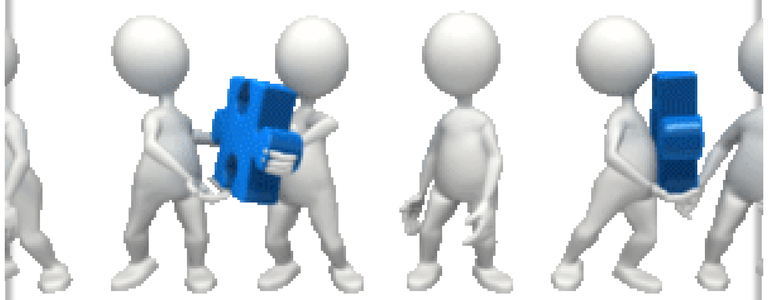
- Content and data for documentation
- Clash detection
  - 3D modeled operational clearances
  - ADA clearances
  - Service clearances
- Visualization, Virtual Reality and Augmented Reality - may need more developed or manufacturer specific content earlier in the game
- Content for analysis – space, thermal, daylighting, etc.



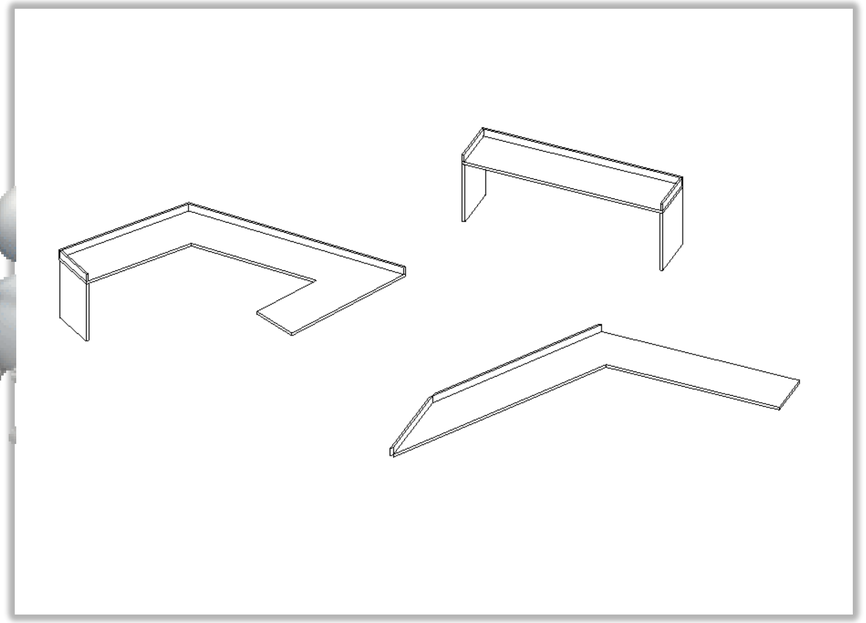
Assets: Continuity of Development



SD placeholder



Non Disruptive Replacement



Replaced by countertops

+cabinets

+sinks

Content Delivery System

Who’s library is it?

Stakeholders:

- Designers
- Content managers
- Content creators
- Content publishers
- Manufacturers
- Construction company
- Owners/facility managers



User’s Perspective: Find-Ability

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
- Convenient to insert (less clicks)
- Good previews



Workflows

- Content request tool
- Content publishing process - with approval
- Source, author(s) and approver(s)
- Content rating system
- Reject with comment
- Handling of different Revit versions

Content Manager’s Perspective

- Security and version control - granular
- AD Integration
- Reporting - usage, user feedback, assets performance, etc.
- Metadata
  - parameters
  - custom tags
- bulk and group processing
- Type catalogs
- Content grouping and multi-grouping. Packages.
- Request ,Approval , Reject process
- Content harvesting and submission process



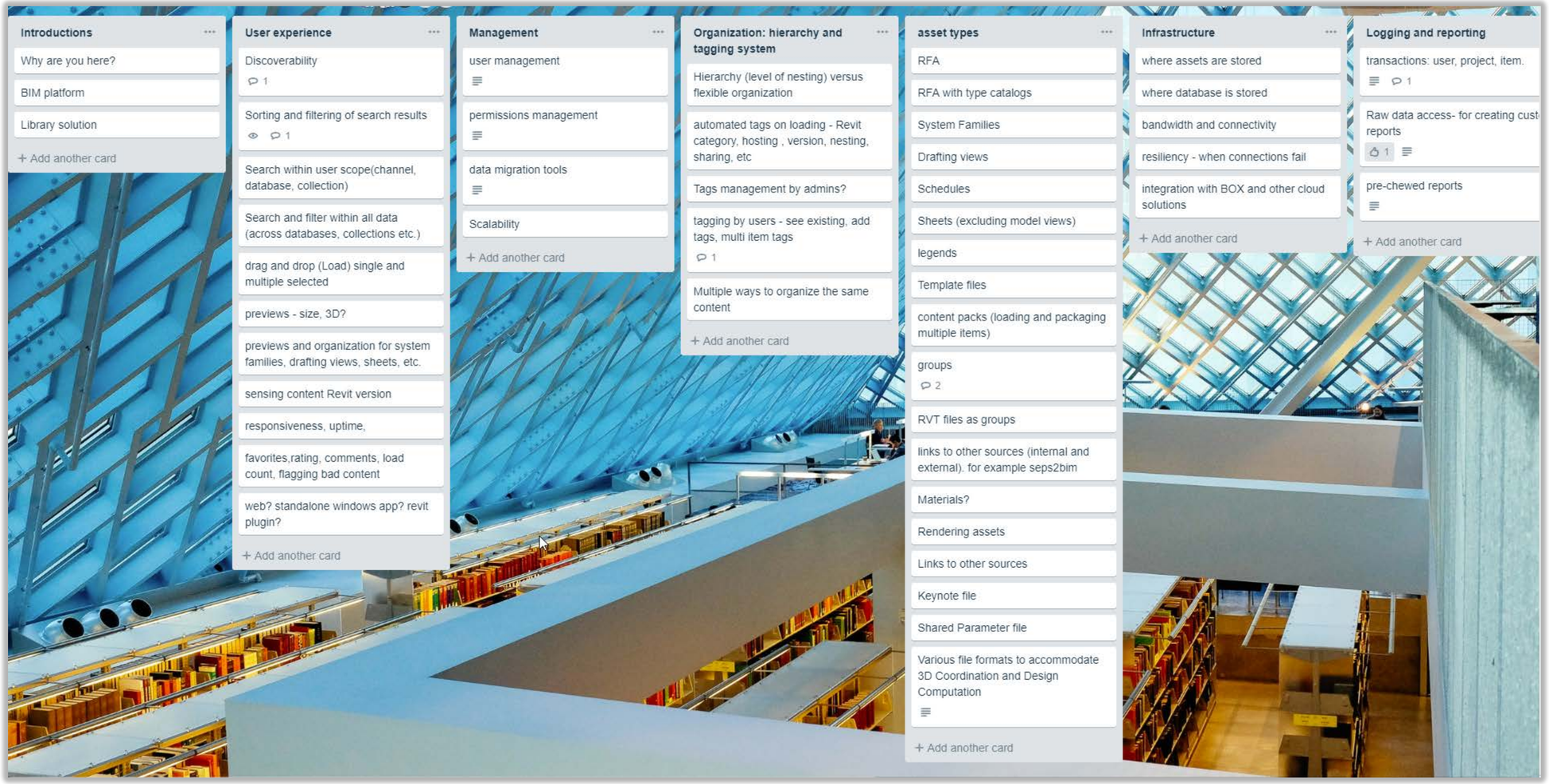
Business Issues

- 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.



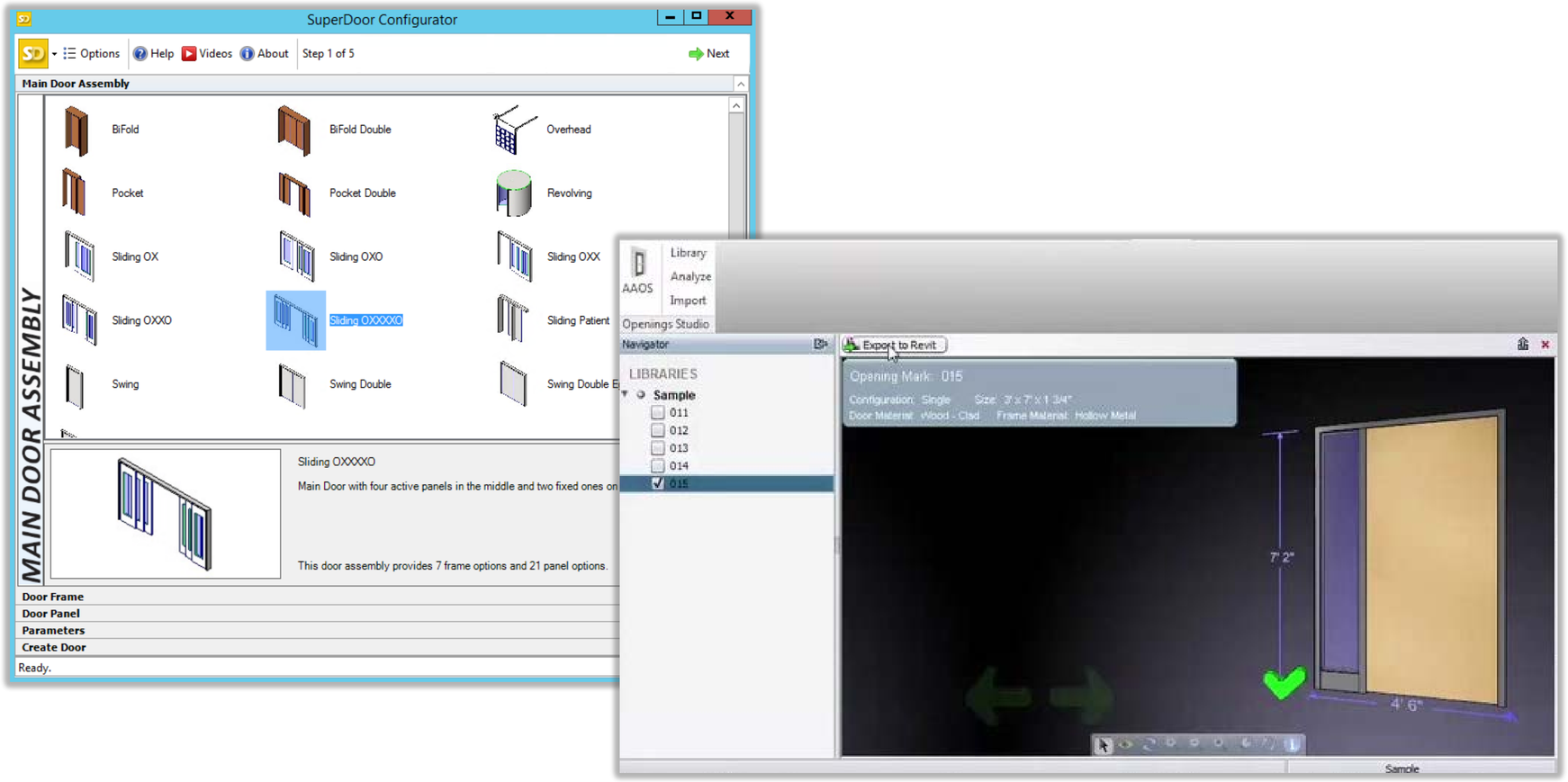
Your Solution and Your Dream

- Avail?
- BIMList?
- Hive?
- Kiwicodes?
- Unifi?
- Others?

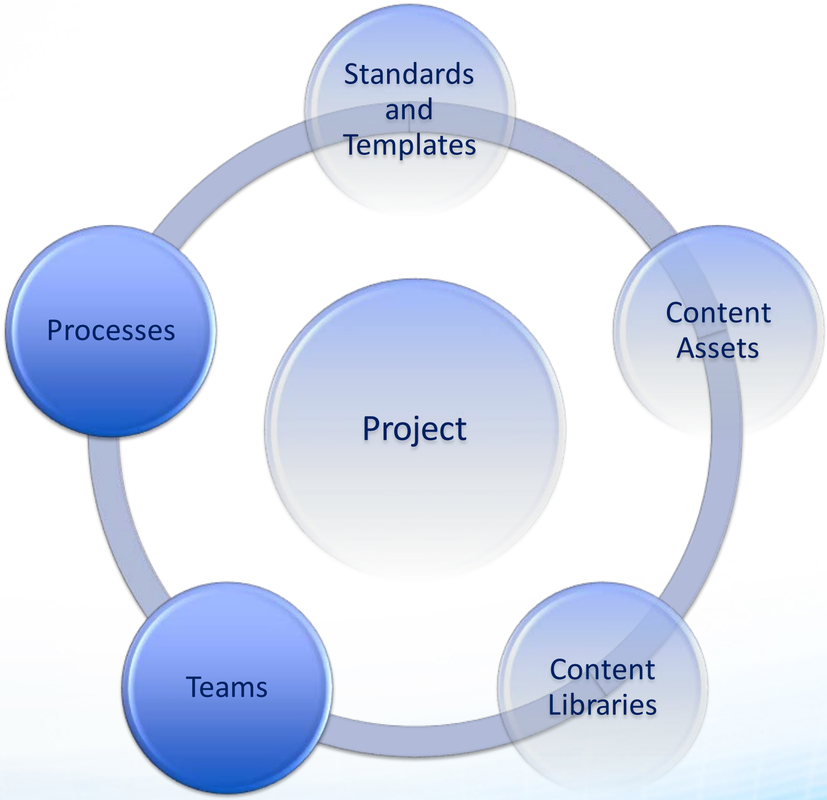


[Link to public Trello board]

When a library is not enough - Content Factories



Project Teams



Revit Skill Assessment

- Institutional knowledge
  - How many years or Revit practice in your office
  - Type and scale of projects
  - Experts network (Digital Practice team)
  - Proprietary workflows. Staff turnover
- Individual proficiencies
  - 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 training for teams







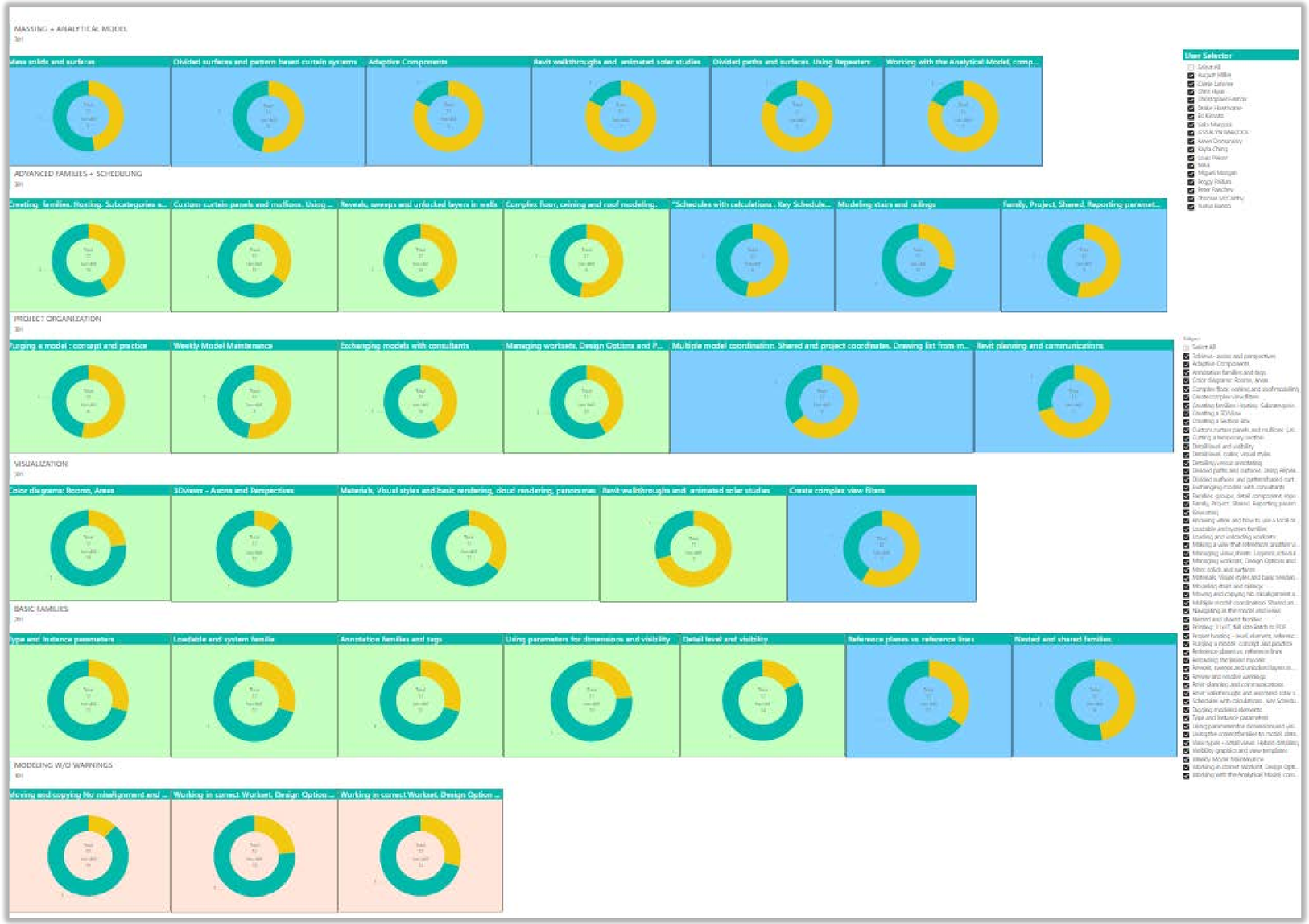
Revit Skill Assessment

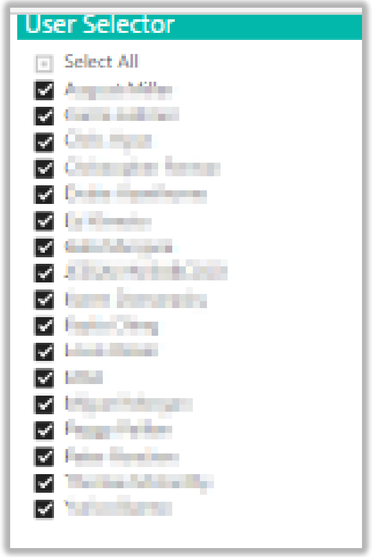
Mass solids and surfaces		Divided surfaces and pattern based curtain systems		Adaptive Components	Divided paths and surfaces. Using Repeaters	Working with the Analytical Model, computational methods	MASSING and ANALYTICAL MODEL
Creating families. Hosting. Subcategories and parameters.	Custom curtain panels and mullions. Using embedded detail components.	Reveals, sweeps and unlocked layers in walls		Complex floo and roof mod			
Purging a model : concept and practice	Weekly Model Maintenance	Exchanging models with consultants		Managing wo and Phases			
Color diagrams: Rooms, Areas	3dviews- axons and perspectives	Materials, Visual styles and basic rendering, cloud rendering, panoramas	Re so				
Type and Instance parameters	Loadable and system families.	Annotation families and tags		Using parame dimensionsan visibility			
Moving and copying No misalignment and duplicates	Working in correct Workset, Design Option and Phase	Proper hosting - level, element, reference plane.		Using the cor families to m detail, or ann			
Making a view that references another view	Tagging modeled elements.	Detail level, scales, visual styles.		Families, gro detail compor repeating det			
Knowing when and how to use a local or a detached file	Printing: 11x17, full size Batch to PDF	Navigating in the model and views		Loading and u worksets			

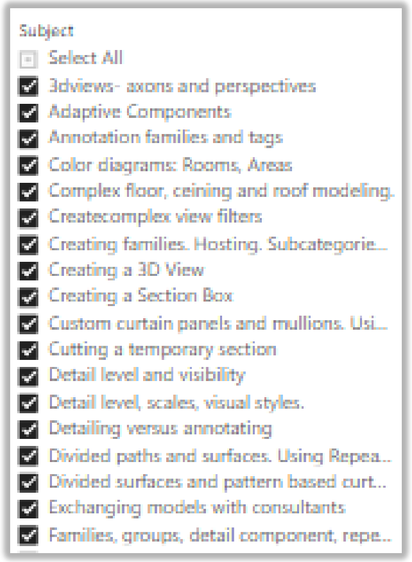
Row Labels	Average of Experience 1-5
[redacted]	2.75
101	
DETAILING ANNOTATING	2.86
Detail level, scales, visual styles.	3.00
Detailing versus annotating	3.00
Families, groups, detail component, repeating details	3.00
Keynoting	2.00
Making a view that references another view	4.00
Tagging modeled elements.	3.00
View types - detail views. Hybrid detailing.	2.00
MODELING W/O WARNINGS	3.43
Managing views,sheets. Legends,schedules	4.00
Moving and copying No misalignment and duplicates	4.00
Proper hosting - level, element, reference plane.	3.00
Review and resolve warnings	3.00
Using the correct families to model, detail, or annotate	2.00
Visibility graphics and view templates	4.00
Working in correct Workset, Design Option and Phase	4.00
OPENING VIEWING	4.50
Creating a 3D View	5.00
Creating a Section Box	4.00
Cutting a temporary section	5.00
Knowing when and how to use a local or a detached file	5.00
Loading and unloading worksets	4.00
Navigating in the model and views	5.00
Printing: 11x17, full size Batch to PDF	3.00
Reloading the linked models	5.00
201	
BASIC FAMILIES	2.43
Annotation families and tags	2.00
Detail level and visibility	4.00
Loadable and system families.	3.00
Nested and shared families.	1.00

Row Labels	Average of Experience 1-5
(blank)	
[redacted]	1.00
[redacted]	1.63
[redacted]	1.83
[redacted]	1.96
[redacted]	2.53
[redacted]	2.75
[redacted]	2.96
[redacted]	3.10
[redacted]	3.15
[redacted]	3.27
[redacted]	3.31
[redacted]	3.60
[redacted]	3.61
[redacted]	3.88
[redacted]	3.92
[redacted]	4.42
[redacted]	4.58
Grand Total	3.03

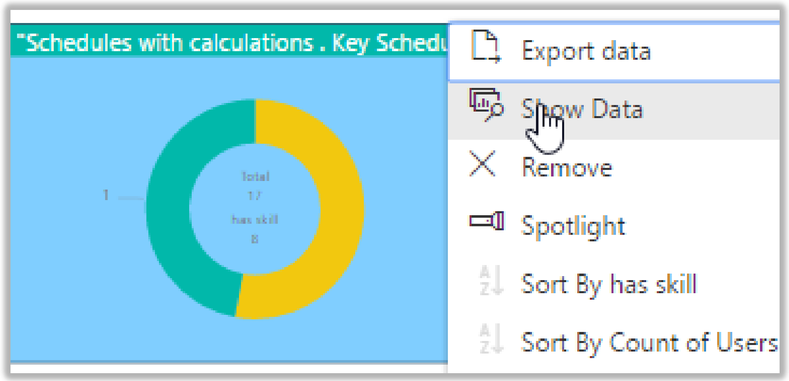
Revit Skill Assessment

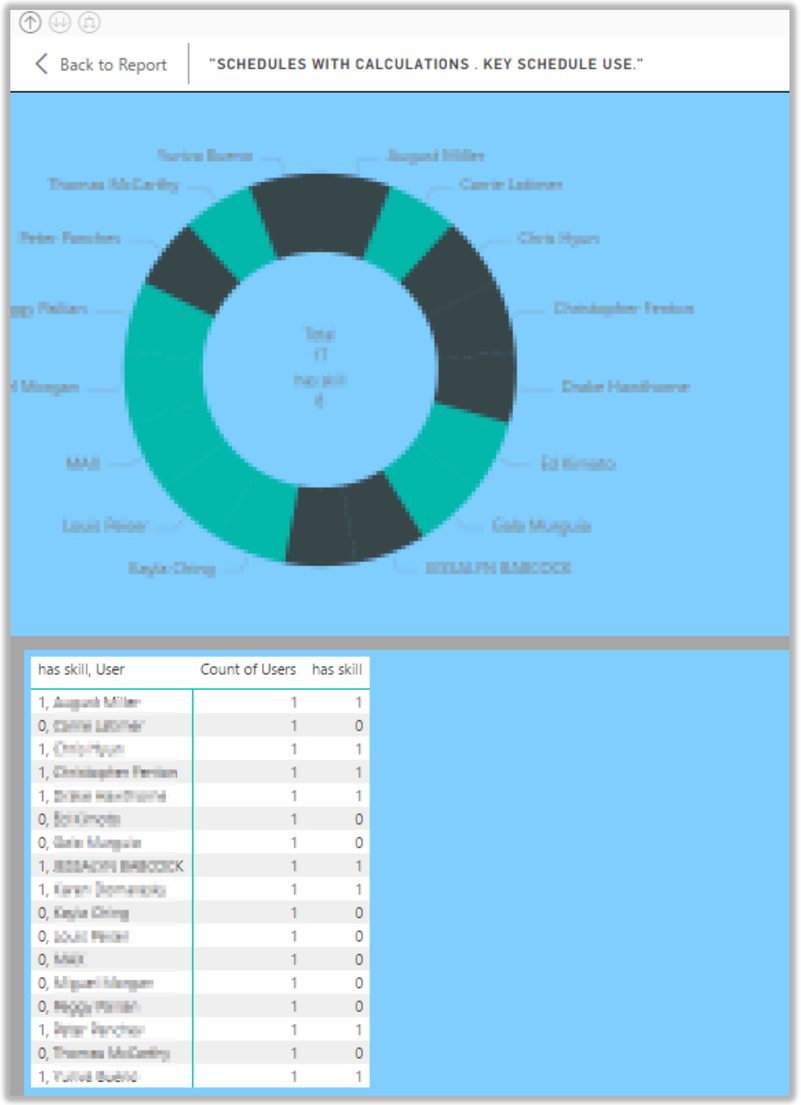






Revit Skill Assessment





Who is on the team?

History

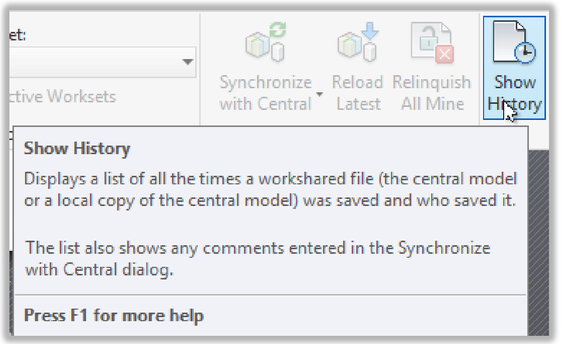
Click on a column heading to sort by that column.

Date/Time Stamp	Modified by	Comments
8/16/2018 2:52:19 PM	Vincent.Lee@perkinswill.com	
8/16/2018 2:36:51 PM	daniel.rollet	
8/16/2018 2:34:51 PM	daniel.rollet	
8/16/2018 2:21:37 PM	daniel.rollet	
8/16/2018 2:17:50 PM	Stephanie.Domek@perkinswill.com	
8/16/2018 1:57:34 PM	rebecca.groves	
8/16/2018 1:46:18 PM	daniel.rollet	
8/16/2018 12:37:24 PM	daniel.rollet	
8/16/2018 12:35:42 PM	daniel.rollet	
8/16/2018 12:34:33 PM	Vincent.Lee@perkinswill.com	
8/16/2018 12:33:03 PM	Vincent.Lee@perkinswill.com	
8/16/2018 12:20:57 PM	daniel.rollet	
8/16/2018 12:06:01 PM	daniel.rollet	
8/16/2018 11:44:25 AM	Vincent.Lee@perkinswill.com	
8/16/2018 11:38:42 AM	daniel.rollet	
8/16/2018 11:37:33 AM	Vincent.Lee@perkinswill.com	
8/16/2018 11:36:39 AM	Vincent.Lee@perkinswill.com	
8/16/2018 11:31:17 AM	Vincent.Lee@perkinswill.com	
8/16/2018 11:05:46 AM	rebecca.groves	
8/16/2018 11:03:38 AM	Vincent.Lee@perkinswill.com	
8/16/2018 10:45:46 AM	daniel.rollet	
8/16/2018 10:30:20 AM	Vincent.Lee@perkinswill.com	

Close

Export...

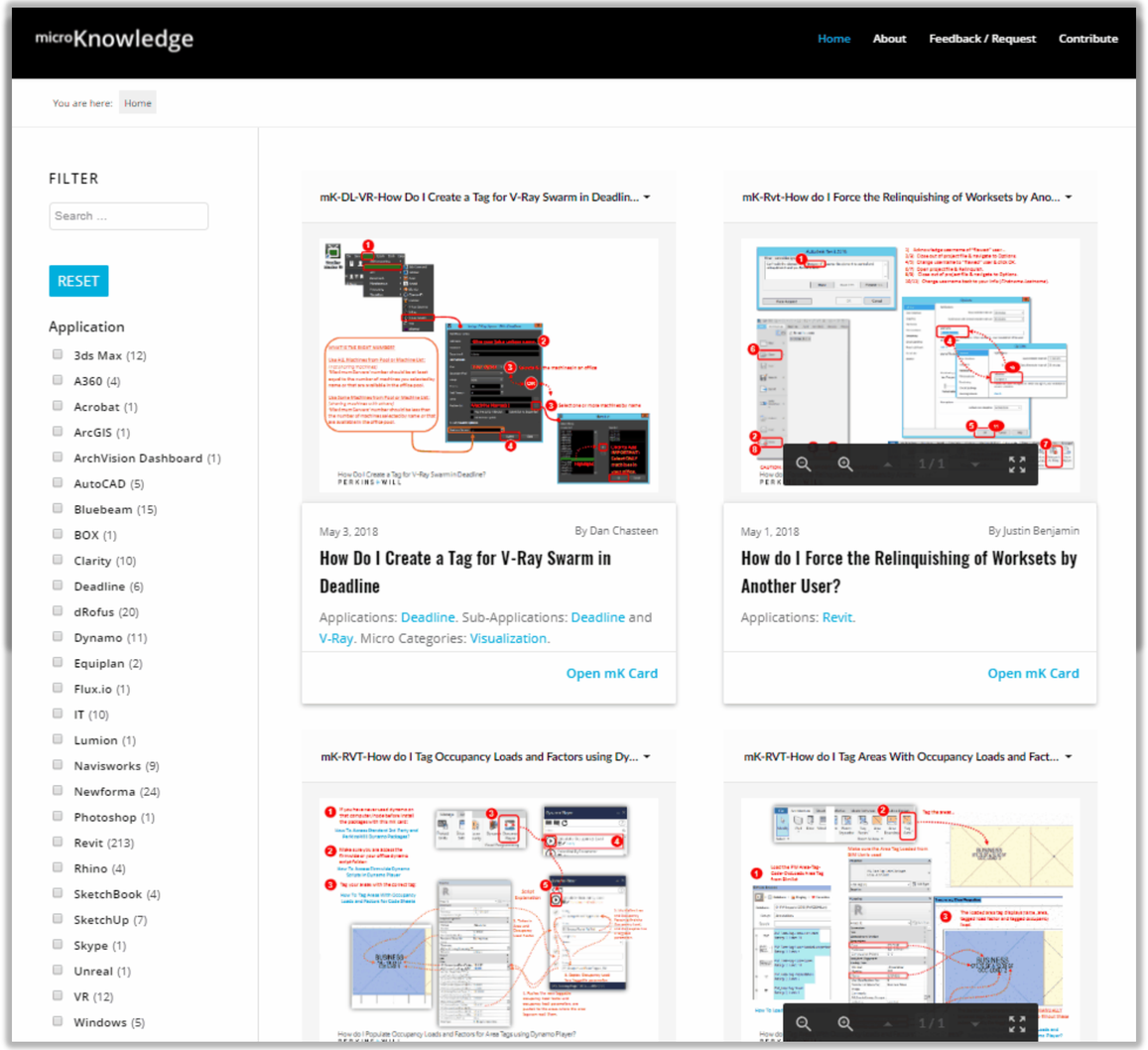
Help



Collaborate->Show History

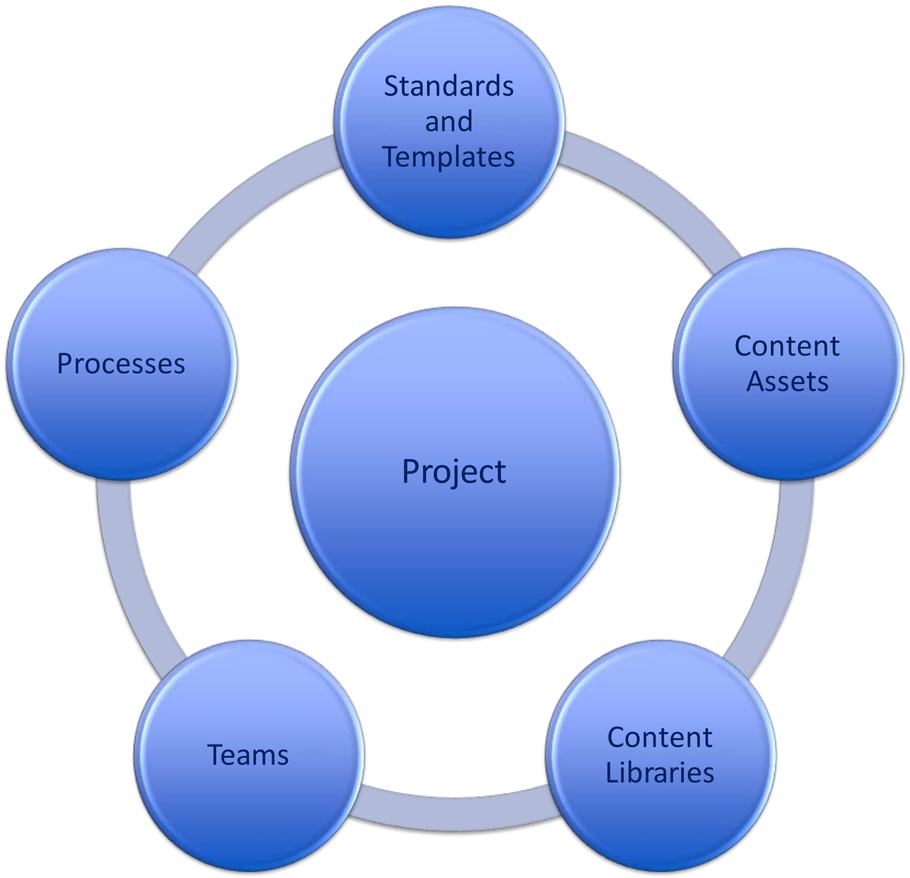
P+W Training and Knowledge Sharing

- 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
- Monthly Digital Practice Newsletter
  - New technology
  - Sharpen Your Tools
  - I Know What You Did in Revit
- Firmwide TTT and case studies



http://mk.perkinswill.info/

Revit Ecosystem- Find Your Balance







AUTODESK®

Make anything™

Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2018 Autodesk. All rights reserved.