



## Collecting, Cataloging, and Leveraging Room Data

Nicholas M. Kramer – HMC Architects

**AB2579** Building Information Modeling: the Building and Modeling parts seem to be down pretty well. It's the Information that continues to evolve and change the AEC industry. The problem with the Information is not its existence, but rather its longevity and connection to the Building. The Information exists, but in too many forms; spreadsheets, databases, catalogs and other miscellaneous documents. The question is, how do you tie these other data sources to the Model?

On bad days, the Information remains fragmented and does not move between disciplines, defeating our attempts to create true BIM. Even on good days Information can make it into a Model and then disappear into the black-hole that is its authoring stage.

We will examine methods to overcome these roadblocks by bringing "Information" in early and keeping it in an accessible form that can feed the planning, design and documentation teams and even become part of the basis for the owner's facilities management. Our discussion will center around the creation, maintenance and accessibility of room data.

We will approach this through the creation of room data sheets that begin in Revit, even before there are rooms. The data then resides in the model and becomes reference material for the documentation team. These sheets can then be used in the field during construction as quality assurance checklists to minimize common miscommunications and their associated costly mistakes through the unification of the design intent with the constructed product.

We will examine the options we have explored for collecting and cataloging room data. We will also address how to simultaneously make the data accessible through both the model as well as through external databases.

### Learning Objectives

At the end of this class, you will be able to:

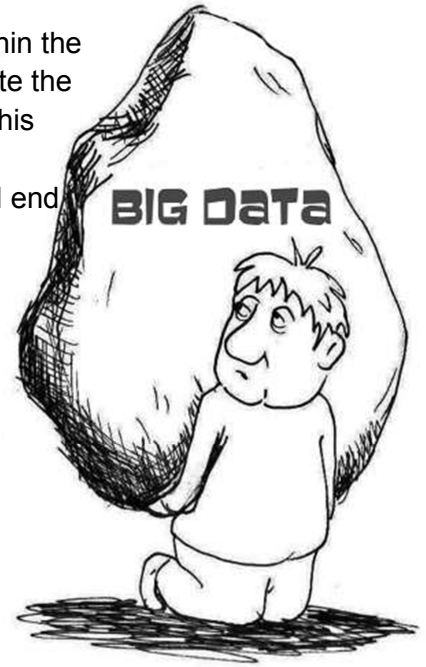
- Build families for data harvesting
- Describe options for collecting and cataloging room data
- Explain your options for data export to Microsoft® Excel®, Microsoft® Access®, and MySQL
- Maintain information from design through facilities management

### About the Speaker

Nicholas M. Kramer, LEED AP BD+C, is a project leader and BIM project administrator at [HMC Architects in Ontario, California](#). He has been using Revit® since version 8.1 and has helped to implement Revit across an architectural company of over 400. He is currently the company/wide resource for BIM content creation and standardization on a wide variety of projects. His project experience varies from a 400,000 square foot library to higher educational laboratory buildings to medical tenant improvements to the renovation of the MLK Hospital in Los Angeles. Nicholas is currently serving as the president of the BIM User Group Inland Empire ([BUGIE](#)), Program Manager for the [Revit Technology Conference: North America](#) and has guest lectured on BIM and sustainability at RTC Australasia, North America, Autodesk University, and other forums.

## Data Harvesting | Revit Families

There is the potential for tons of data to live within Revit and thus within the families that make each model. However, it is a matter of how you create the data, plan on using it and allow external editing that tends to isolate this data. We will cover a few tips and tricks for how to create the data in different forms depending on your project type, size and the intended end use for the data.



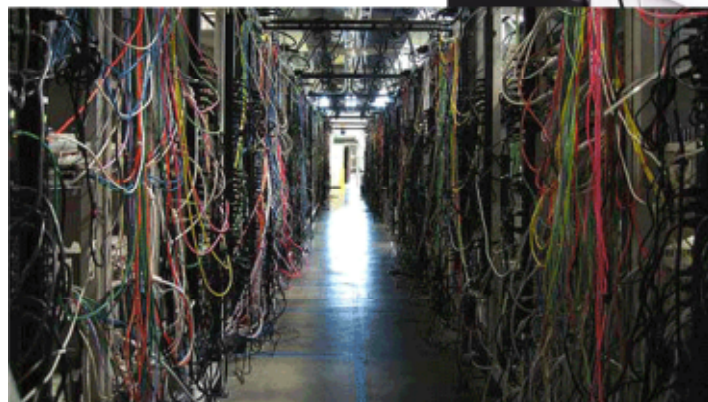
- **Data Goals**
  - What are they?
    - 3d coordination, 4d coordination, 5d estimating, 6d facilities management or something else?
  - Who is responsible for them?
  - What platforms will be used?
    - Revit, Navisworks, AutoCAD, Bentley, Tekla, etc.
- **Project Size and Type\*\***
  - Large: No matter the type of project and the desired uses for the data a mega project will quickly drown under the weight of super-rich families (full data and geometry).
    - File Size: If the estimated individual file size is going to be greater than 250mb consider modifying your standard practices to reduce the size of families that are widely used on a project or create swap families.
      - Individual file size = Actual File + (Revit Linked files \* ~0.1)
        - Other links vary widely on the impact they will have on “file size”. It is really more of a polygon count than the file size for non-Revit links.
      - File Size at the end of Schematic Design \* 3 = File size at the end of Construction Documents
  - Medium and Small: Even smaller projects can benefit from outside editing of the data. While all of the data may reside within Revit, consider creating access points for outside editing and creation of project data.



\*\*ASSUMING THAT COMPANY STANDARDS AND GENERAL BEST PRACTICES ARE FOLLOWED FILES UNDER 250MB SHOULD BE MANAGEABLE WITHOUT COMPROMISING THE DATA OR GEOMETRY OF THE PROJECT.  
 TEN WAYS TO KEEP YOUR REVIT MODEL SPEEDY: <http://www.payette.com/post/664154-ten-ways-to-keep-your-revit-file-size-a-red-herring?>

## Data Harvesting | Revit Tips

- **Standards**
  - Create company standards and have a method of enforcement
    - Project reviews: Kickoff, SD/ DD, CDs + Before As Built Turn over
    - Project team standards: Create standards that everyone can follow; not centered around the architect, project type or client (where possible).
    - For Data Harvesting your standards should include: file naming, folder structure, family naming, shared parameters
  - Allow flexibility in your standards based on project type and size
- **Shared Parameters:** These will become invaluable when you try to use data from multiple sources (multiple files, other programs, multiple projects, etc.)
  - Create a company parameter list: If you use it in more than one family consider creating a shared parameter.
  - Don't create separate shared parameter files unless absolutely necessary: This will cause confusion and defeats the purpose of shared parameters.
  - Don't use out of the box names for your parameters: SP "Width" will get mixed in with other "Width" parameters



WOULD YOU MIND  
CONNECTING MY NEW  
PHONE LINE?

## Data Harvesting | Revit Tips

- **Creating External Connections**

- Create a single connection point.
  - ~~Element ID~~ : Don't use it
    - Element ID **will** be duplicated between linked models.
    - The element ID is created and destroyed with the object.
      - Example: place a view on a sheet, delete it and replace on a sheet and the element id will be different.
  - Unique ID, Type Mark or URL.
    - Unique ID is slightly better than Element ID...
      - Not created and destroyed **as often** as element ID.
      - Theoretically will not be duplicated ever: you have a 1 in  $1.78 \times 10^{62}$  chance...
    - Type Mark, URL and other universal parameters
      - Exist in every object
      - Type Mark: Only allowed one per category
      - URL: doesn't have to be an actual link
  - Create your own unique name like *Data Connection Number*
    - If you are consistently pushing data consider adding a shared parameter to everything
    - This should be a text parameter to maximize flexibility.
    - Consider the data origin: If you depend on Element ID or Unique ID the object has to *exist in Revit first* and then be mapped to the database.



- **Super Families:** Consider creating families where the data can be changed within the family rather than changing the family itself.
  - Increases flexibility for editing: inside and outside of Revit
  - Decreases the number of families to manage
  - Increases File size (potentially)
  - Requires more knowledge of Revit families as well as how *your* families were made.



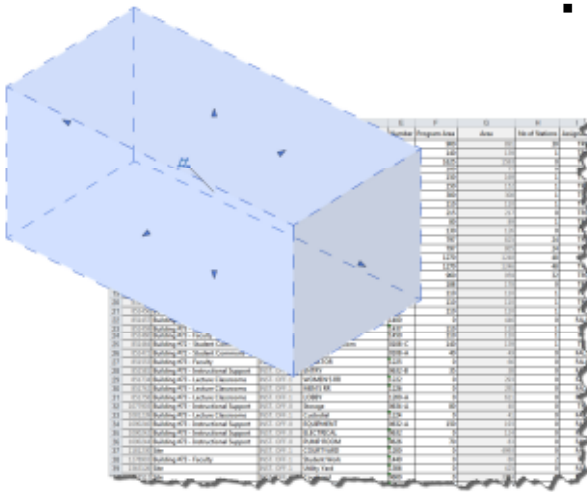


## Data Harvesting | Revit Families: Data, Geometry or Both

- **Both | Super Families:** One family to rule them all
  - Everything in one place; one file with different buttons for estimating, rendering, documentation and facilities management.
  - Creates simple editing and organization
  - Large cumbersome files
  - Can be a lot of work for little reward
    - Rendering a janitors closet..?



MICHAEL ANDRUEVO  
[HTTP://LITLEDDETAILSCOUNT.COM/](http://littledetailscount.com/)



- **Data Only Families:** Generic 3d representation with all of the information necessary to schedule and connect with external databases.

- Primarily for data intensive projects: MEP, healthcare, government, etc.
- Reduces file size and regeneration times
- Used for documentation and FM
- Only allows for basic spatial feeling of project

RTC2012- NORTH AMERICA

LOD 100?: DATA INTELLIGENT FAMILIES IN MEGA PROJECTS

[HTTP://DB.TT/ZJKRix8A](http://db.tt/ZJKRix8A)

- **Geometry Only Families:** Accurate 3d geometry without all of the data input
  - Renderings, walkthroughs and user group presentations.
  - Significantly increases file size
  - Requires additional work to make family documentation ready
- **Swap Families:**
  - Create multiple families with the same name.
  - Each one has its own purpose.
  - Can switch between data rich to visually rich in very little time.
  - Requires each object to be *modeled* more than once



## Collecting and Cataloguing Data | Routes

Data routes are tied to the way that you build the information within Revit. Using Revit as the sole source for data may work for some people and some projects, but will significantly hinder others.

- **Internal Data | Revit Only**

- Based on the Super Family concept: potentially heavy and complex families
- Single database: no redundancy and reduced opportunity for errors
- Everyone works in and knows Revit: Right..?

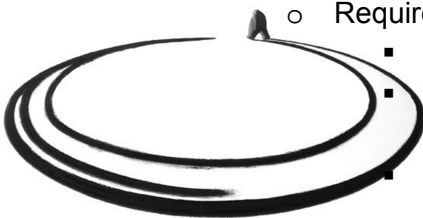
- **External Data | Non Revit**

- Families in Revit created for documentation purposes
- Data Lives outside of project for everyone to access
  - Allows for multiple databases in multiple formats for best use by the entire project team
- Generally leads to redundant and possibly conflicting data amongst databases



- **Round Tripping | Multi Format**

- Data lives in Revit as well as an external database
- Allows data to be edited where it needs to be while living where it wants to be
  - Door hardware, interiors and other consultants can edit in Excel and send back for immediate incorporation into the model
- Requires sophisticated link between Revit and an external data base
  - External data base is generally limited to a single format
  - Link generally requires manual import/ export
    - Good for control of data
  - Requires coordination between databases and users to prevent redundant work



## Data Routes | Central Database Options

Typically a building starts out as a disconnected collection of Data. We use program documents, standards, cut sheets, web sites and more to create our central project database. The following integrate with Revit and allow multipoint access.

- **Revit Database Link (Rdb Link)**

- General
  - Can integrate with other Revit API applications and routines
  - General knowledge of programming required
- MySQL
  - Uses
    - Best for large or complex projects.
    - Single database systems with powerful ownership and authorship rights.
  - Open Source database allows for easy integration with multiple platforms
  - Robust database management system
  - Advanced database administration/ management tools
  - Large startup costs
- Microsoft Access
  - Uses:
    - Small to medium projects or projects under one “Roof”
    - Portable database (email able)
  - Integrates with Microsoft Office
  - Desktop database with limited number of simultaneous users
  - Smaller startup costs (may be part of your MS Office install already)



- **Excel Links**

- General
  - Excel is fairly universal, in that, owners, clients and consultants are able to understand and edit it.
  - Limited Excel formula knowledge required; some VBA is a plus but not required
- Ideate BIM Link
  - Handles large sets of data consistently
  - \$800 - \$1000 per seat with full support
- Revit Excel Link
  - Good for smaller datasets
  - \$100 per seat



## Creating an Ecosystem | Gestalt

Over the past several years I have been working on creating an ecosystem that allows multiple people to author, edit and utilize the information within Revit. This started off simply using the export function from Revit schedules to connect with other external databases and has evolved to a point where the authorship is no longer limited to Revit and the use is no longer limited to database programs.



Authorship: Revit (and other BIM platforms), PDF, Excel (or any other database)

Users: General knowledge of PDFs or Excel is ideal, but not required.

Uses: Programming and Program Validation; Attachment and Mounting Details; Room, Door, MEP and other Schedules; Version tracking; Estimating; Construction QA; Facilities Management; + more



## Creating an Ecosystem | Data CCL

- **Data Collection**
  - Harvesting from multiple sources
    - Typically a building starts out as a disconnected collection of Data
      - Program Documents
      - Standards
      - Cut Sheets
      - Web Sites
    - Through Excel and BIM Link we are able to create a database
  - Multi Point Access
    - Excel is fairly universal, in that, owners, clients and consultants are able to understand and edit it.
    - The challenge is the initial creation of the higher end functions and links between multiple files and data sources.
- **Cataloguing** Data
  - The best way to maintain the database is to allow the authoring programs and authors themselves to manage their own files.
  - Maintaining this back end of the database can be a challenge as it continues to evolve
- **Leveraging** Data
  - Maintainable Data
    - Once data is created it is passed from designer to contractor to owner. Generally each one of these groups has different software needs and skill levels. Creating data that is maintainable regardless of the end user is the ideal.
    - Allowing most of the data to be accessed through excel and other databases can help to bridge this gap.
      - Subdivide dataset entry (Programming, Cut sheets, M+O, etc.)
      - Create an overall database to combine and drive the model information.
  - Cross platform
    - Ultimately creating data and leaving it in Excel or any other database is not much better than leaving it in Revit. Creating exportable sets of data is the ultimate goal; to find a common path between software and personnel.

## Collecting | Starting Out

Finding all of your data at the beginning of a project is nearly impossible. Because of this the focus should be on creating an expandable, editable and mobile database.




- **Excel**
  - Data Sets
    - 1 Master data set
  - Unifying Factor
    - Manual Input
      - Most Stable
      - Requires Significant Set up time
    - Revit Element or Unique ID
      - Automatically Created by Revit
      - Destroyed by You/ Revit
      - Can start with a blank and then fill out
    - Both
      - Offers stability and instant start up

Revit ID	Room Name	Program Area	Schematic Area	Preliminary Area	Working Drawings Area
7	Building #72 - Student Commons				
8	Graduate Student Commons	0108	900 sf	851 sf	-9 sf
9	Group Study Room	0108-B	140 sf	139 sf	-1 sf
10	Group Study Room	0108-C	140 sf	139 sf	-1 sf
11	Undergraduate Commons	1102	1625 sf	1593 sf	-32 sf
12	Grab n' Go	1102-A	100 sf	77 sf	-23 sf
13	Building #73 - Faculty Offices				
14	Executive Director	1427	150 sf	169 sf	+19 sf
15	Executive Administration	1429	150 sf	152 sf	+2 sf
16	Faculty Office	1449	110 sf	110 sf	+0 sf
17	Faculty Office	1445	110 sf	110 sf	+0 sf
18	Faculty Office	1443	110 sf	110 sf	+0 sf
19	Faculty Office	1441	110 sf	110 sf	+0 sf
20	Faculty Office	1437	110 sf	110 sf	+0 sf
21	Faculty Office	1450	110 sf	110 sf	+0 sf
22	Conference Room	1448	215 sf	217 sf	+2 sf
23	Copy Room	1444	85 sf	89 sf	+4 sf
24	Faculty Lounge	1446	130 sf	126 sf	-4 sf
25	Student Work	1449	0 sf	80 sf	+80 sf
26	Building #73 - Instructional Support				
27	Instructional Support	0642	797 sf	825 sf	+28 sf
28	Instructional Support	0364	797 sf	805 sf	+8 sf
29	Storage	0636-A	86 sf	40 sf	-46 sf
30	Building #73 - Lecture Classrooms				
31	Lecture Classroom	1202	1270 sf	1248 sf	-22 sf
32	Lecture Classroom	1212	1270 sf	1246 sf	-24 sf
33	Lecture Classroom	1230	960 sf	959 sf	-1 sf
34	Storage	1235	188 sf	178 sf	-10 sf
35	Totals		9962 sf	9941 sf	-11 sf
36	Gross Sq. Feet (Taken from estimate)			15565 sf	
37	% Efficiency			64.11%	

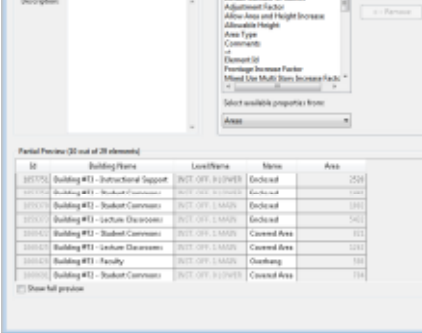
## Collecting | Determining Your Needs

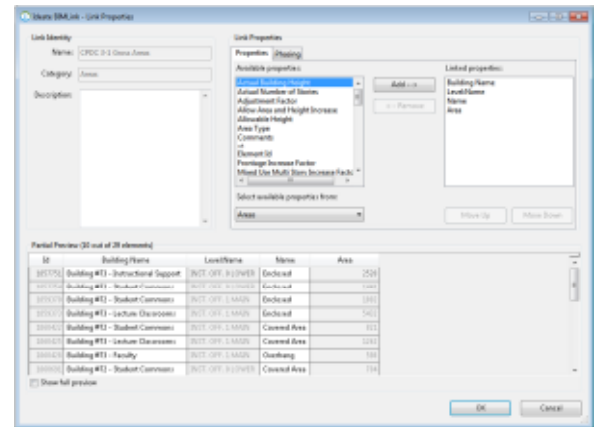
- Intended Uses
  - Programming
  - Documentation
  - Construction
  - Maintenance and Operation
- Room Data
  - Unifying Factor (Programmatically)
  - Basic information: Building, Floor, Name, Number
- Program Data
  - Area: Program, Actual, Deltas
  - Other: FF+E, FTE, Station, Special Requirements
- FF+E: Fixed, Moveable, Group I and Group II
  - What
  - How Many
  - References: Details, Cut Sheets
- Finish Schedule
  - Floor, Walls, Ceiling, etc.
  - Same information as on drawings
- Drawing Information
  - View References: Plan and Elevation
  - Progress/ Completion and Comments

ROOM DATA SHEET																		
Program Reference Number		Level		Room Name		Room Number												
73017		INST. OFF. 1 MAIN		Lecture Classroom		1202												
Program Data																		
Program Area	Area	Area Delta	Area Delta Percentage	No of Stations	Assignable	Program Comments												
1270 SF	1248 SF	-22 SF	-1.77%	48	Yes													
Furniture and Equipment - Group I						Furniture and Equipment - Group II												
Type	Count	Di Ref	URL	Type	Count	Di Ref	URL											
Projector And Screen	1			Chair	48													
				Podium	1													
FINISH SCHEDULE																		
FLOOR		BASE		WAINSCOT		WALLS						REMARKS						
MAT	CLR	MAT	CLR	MAT	CLR	HT	NORTH	EAST	SOUTH	WEST								
							MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td></td></td></td></td></td>	FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td></td></td></td></td>	CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td></td></td></td>	MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td></td></td>	FN <td>CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td></td>	CLR <td>MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td></td>	MAT <td>FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td></td>	FN <td>CLR <td>MAT <td>FN <td>CLR </td></td></td></td>	CLR <td>MAT <td>FN <td>CLR </td></td></td>	MAT <td>FN <td>CLR </td></td>	FN <td>CLR </td>	CLR
Drawing Data																		
PlanReference	NorthElevation	EastElevation	SouthElevation	WestElevation	Comments													
E11A7.11	B3A7.11	1A7.10	A3A7.11	A1A7.11														
NOTES																		
<div style="display: flex; justify-content: space-between; align-items: center;"> <div> <b>HMC Architects</b>  <small>3546 Concourse Street / Ontario, CA 91764            T 909 989 9979 / www.hmcarchitects.com</small> </div> <div style="text-align: center;">  </div> <div> <small>COLLINS COLLEGE EXPANSION, PHASE III            THE COLLINS COLLEGE OF            HOSPITALITY MANAGEMENT            COLLINS COLLEGE - CAL POLY POMONA            3801 WEST TEMPLE AVENUE BUILDING #72 &amp; #73            POMONA, CALIFORNIA 91768</small> </div> </div>																		

## Collecting | Excel Links

- **BIM Link**

- Data Sets
    - 1 data set per output
      - From Revit
      - From Master Dataset
  - Not a Schedule
    - Not available in BIM Link
      - Totals + Calculations
      - Filters, Sorting/ Grouping
      - Formatting/ Appearance
    - Available in BIM Link
      - Schedule Keys as Separate List
      - Element and Unique ID
      - Design Options, Level and Phase
        - Including Unique and Element ID, Height of Level or Unbounded Height of Room
  - Raw Data
    - Sorted by Element ID (time when they were created)
    - Greyed out indicates a “read only” field
    - Text (Materials) or Numbers (Lengths, Integers, Angles)
    - Continually rewritten
- 
- The screenshot shows the Revit interface. The top part displays the 'Properties' palette for a selected 'Room' element, listing various parameters like 'Adjustment Factor', 'Allow Area and Height Increase', 'Allowable Height', 'Area Type', 'Comments', 'Element ID', 'Percentage Increase Factor', and 'Mixed Use Multi-Store Increase Factor'. Below this is a 'Partial Preview' table showing a list of rooms with their unique IDs, names, levels/phases, and areas.
- | ID      | Room Name                            | Level/Phase      | Status   | Area  |
|---------|--------------------------------------|------------------|----------|-------|
| 2017154 | Building #11 - Student Stand Support | 2017 CPE 1.00000 | Enclaved | 25.04 |
| 2017155 | Building #11 - Student Stand Support | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017156 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017157 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017158 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017159 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017160 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017161 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017162 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017163 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017164 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017165 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017166 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017167 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017168 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017169 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017170 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017171 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017172 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017173 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017174 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017175 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017176 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017177 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017178 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017179 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017180 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017181 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017182 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017183 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017184 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017185 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017186 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017187 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017188 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017189 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017190 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017191 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017192 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017193 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017194 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017195 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017196 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017197 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017198 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017199 | Building #11 - Lecture Discussion    | 2017 CPE 1.00000 | Enclaved | 1.00  |
| 2017200 | Building #11 - Student Comments      | 2017 CPE 1.00000 | Enclaved | 1.00  |



A	B	C	D	E	F	G	H
1	Id	Building	Level/Name	Name	Number	Program Area	Area
2	206108	Building #72 - Student Commons	COMMONS 0	Graduate Student Commons	0108	900	891
3	222531	Building #72 - Student Commons	COMMONS 0	Group Study Room	0108-B	140	139
4	222533	Building #72 - Student Commons	COMMONS 1	Undergraduate Commons	1182	1625	1593
5	387683	Building #72 - Student Commons	COMMONS 1	Grab n' Go	1182-A	100	77
6	849458	Building #73 - Faculty	INST. OFF. 1	Executive Director	1427	150	169
7	849459	Building #73 - Faculty	INST. OFF. 1	Executive Director	1429	150	152
8	849460	Building #73 - Faculty	INST. OFF. 1	Executive Administration	1229	300	308
9	849461	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1449	110	110
10	849463	Building #73 - Faculty	INST. OFF. 1	Conference Room	1435	215	217
11	849464	Building #73 - Faculty	INST. OFF. 1	Copy Room	1444	80	89
12	849465	Building #73 - Faculty	INST. OFF. 1	Faculty Lounge	1446	130	126
13	849466	Building #73 - Instructional Support	INST. OFF. 0	Instructional Support	0642	797	825
14	849467	Building #73 - Instructional Support	INST. OFF. 0	Instructional Support	0364	797	805
15	849469	Building #73 - Lecture Classrooms	INST. OFF. 1	Lecture Classroom	1202	1270	1248
16	849470	Building #73 - Lecture Classrooms	INST. OFF. 1	Lecture Classroom	1212	1270	1246
17	849471	Building #73 - Lecture Classrooms	INST. OFF. 1	Lecture Classroom	1230	960	959
18	849472	Building #72 - Student Commons	INST. OFF. 1	Storage	1235	188	178
19	851348	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1445	110	110
20	851394	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1443	110	110
21	851456	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1441	110	110
22	851457	Building #73 - Faculty	INST. OFF. 1	Hallway	1400	0	446
23	851459	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1437	110	110
24	851460	Building #73 - Faculty	INST. OFF. 1	Faculty Office	1450	110	110
25	851464	Building #72 - Student Commons	COMMONS 0	Group Study Room	0108-C	140	139
26	851472	Building #72 - Student Commons	COMMONS 0	Custodial	0108-A	40	49
27	851553	Building #73 - Faculty	INST. OFF. 1	ELEVATOR	1225	0	66
28	851554	Building #73 - Faculty	INST. OFF. 1	ENTRY	1233	0	30

## Cataloguing | Big Data

Our focus is on the creation of Room data that is useable by everyone. Part of this data is linked to the drawings; plans, elevations, details and cross discipline coordination. In the past we have used text for these “connections.” However, Revit requires the use of callouts. Generally this works, but does not allow an object itself to reference the drawings.



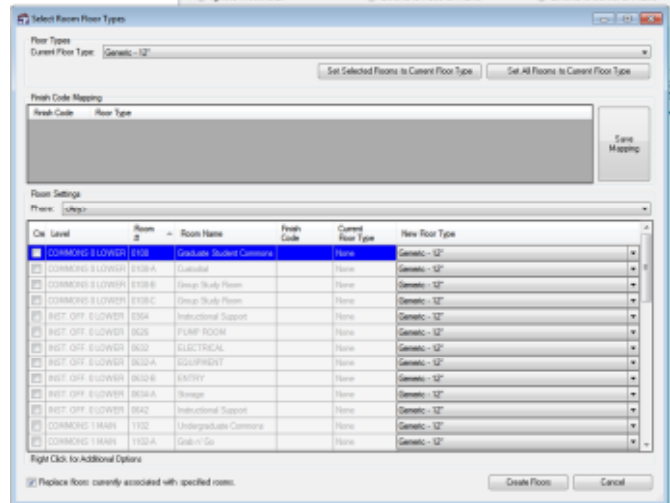
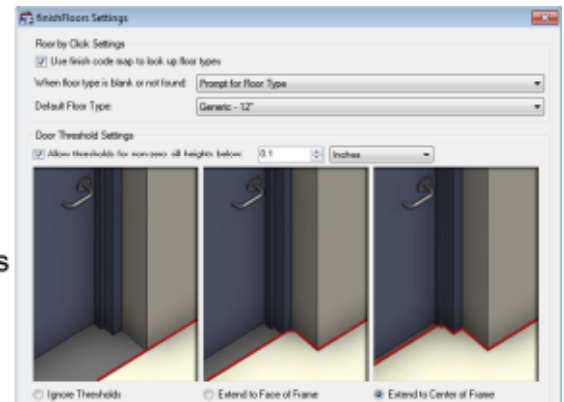
- **Revit**
  - Categories
    - Islands except for:
      - Multi Category Schedules
      - Objects in Rooms
      - Objects in Spaces
    - No link between
      - Rooms and Spaces
      - Rooms and walls, floors or Ceilings
      - Height above grade (from host: Level, Floor, etc.)
      - Drawings
  - Limited Users
    - Own Revit to change data: 5k to change door heights..?
    - Own something that can run Revit: Large projects can require computers that cost several thousand dollars just so that you can open the file.
    - Understand Revit to change data
      - Revit can be daunting for someone to learn. Especially if they have little need or use for it.
      - Changing the height of one door could accidentally change all of the doors....



## Cataloguing | Bridges

- **workFlow**

- Bridging the Divide
  - Brings some categories together
  - Allows more data to be intelligent
  - Makes data portable
    - Revit to Excel/ outside databases
    - Revit to PDF
- Finish Floors
  - Automatically bridge one of Revit's Gaps
  - Create finish floors per room
    - One Click (like ceilings)
    - Trim around door jambs
  - Link Finish Floors to a Room
- autoLink
  - Link any object to a view



Program Ref	Program Spa	Program Area	Area	Level	Number	Name	Plan/View Ref	North Elevation	East Elevation	South Elevation	West
72001		900 SF	891 SF	COMMONS 0 0108		Graduate	A10A2.00				
72002		140 SF	139 SF	COMMONS 0 0108-B		Group Stu	A10A2.00				
72004		1625 SF	1593 SF	COMMONS 1 1102		Undergra	A10A2.10				
72005		100 SF	77 SF	COMMONS 1 1102-A		Grab n' G	A10A2.10				
73001		150 SF	169 SF	INST. OFF. 1 1427		Executive	A10A2.10				
73002		150 SF	151 SF	INST. OFF. 1 1429		Executive	A10A2.10				
73003		300 SF	308 SF	INST. OFF. 1 1229		Executive	A10A2.10				
73004		110 SF	110 SF	INST. OFF. 1 1449		Faculty O	A10A2.10				
73010		216 SF	216 SF	INST. OFF. 1 1435		Caterlan	A10A2.10				
73011		80 SF	80 SF	INST. OFF. 1 1444		Copy Roo	A10A2.10				
73012		130 SF	128 SF	INST. OFF. 1 1446		Faculty L	A10A2.10				
73014		797 SF	825 SF	INST. OFF. 0 0642		Instructio	A10A2.00				
73015		797 SF	805 SF	INST. OFF. 0 0364		Instructio	A10A2.00				
73017		1270 SF	1248 SF	INST. OFF. 1 1202		Lecture C	E10A7.11	B3A7.11	10A7.10	A3A7.11	A10A
73018		1270 SF	1248 SF	INST. OFF. 1 1212		Lecture C	E10A7.11	B3A7.11	10A7.10	A3A7.11	A10A
73019		960 SF	959 SF	INST. OFF. 1 1230		Lecture C	A10A2.10				
73020		188 SF	178 SF	INST. OFF. 1 1235		Storage	A10A2.10				
73005		110 SF	110 SF	INST. OFF. 1 1445		Faculty O	A10A2.10				
73006		110 SF	110 SF	INST. OFF. 1 1443		Faculty O	A10A2.10				
73007		110 SF	110 SF	INST. OFF. 1 1441		Faculty O	A10A2.10				
73010		0 SF	446 SF	INST. OFF. 1 1400		Hallway	A10A2.10				
73008		110 SF	110 SF	INST. OFF. 1 1437		Faculty O	A10A2.10				
73009		110 SF	110 SF	INST. OFF. 1 1450		Faculty O	A10A2.10				
72003		140 SF	139 SF	COMMONS 0 0108-C		Group Stu	A10A2.00				
72001		40 SF	49 SF	COMMONS 0 0108-A		Custodial	A10A2.00				
73007		66 SF	66 SF	INST. OFF. 1 1225		ELEVATO	A10A2.10				
73004		35 SF	30 SF	INST. OFF. 0 0632-B		ENTRY	A10A2.00				
73008		0 SF	287 SF	INST. OFF. 1 1222		WOMENS	D10A7.10	B5A7.10	B5A7.10	B3A7.10	10A2
73008		0 SF	287 SF	INST. OFF. 1 1226		MEN'S RR	D10A7.10	A5A7.10	A5A7.10	A3A7.10	A10A
73005		611 SF	611 SF	INST. OFF. 1 1200-A		LOBBY	A10A2.10				
73016		80 SF	40 SF	INST. OFF. 0 0634-A		Storage	A10A2.00				
73009		40 SF	40 SF	INST. OFF. 1 1224		Custodial	D10A7.10	D7A7.10	D5A7.10		
73003		150 SF	193 SF	INST. OFF. 0 0632-A		EQUIPM	A10A2.00				
73002		124 SF	83 SF	INST. OFF. 0 0632		ELECTRIC	A10A2.00				
73001		70 SF	83 SF	INST. OFF. 0 0628		PUMP RO	A10A2.00				
90002		4866 SF	4866 SF	INST. OFF. 1 1200		COURTY	A10A1.00	A3A5.12	E6A5.10	E1A5.11	
73007		80 SF	80 SF	INST. OFF. 1 1440		Supply	A10A2.10				

## Leveraging | Formats

Using what you have can be almost as challenging as creating the information. One of the many hot topics in the AEC industry is mobility: using something where and when you need it.

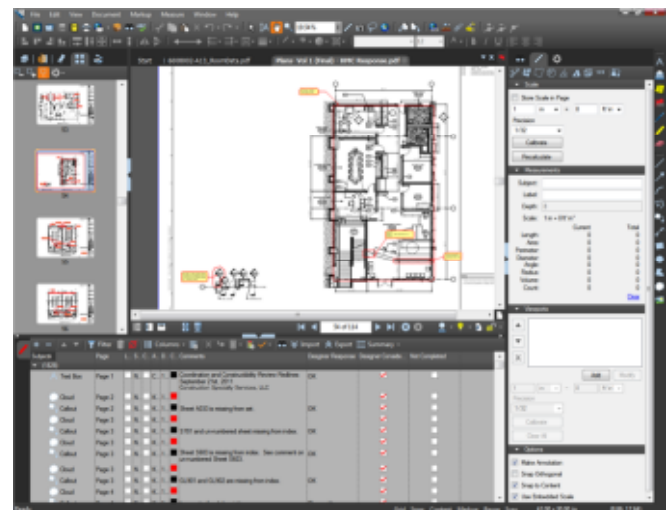
The reality is the contractor or facilities manager will not be using Revit in the field even, assuming that they know how to use it at all.

The challenge is putting the information in a portable and usable format.



- **PDF**

- Portable format
  - Readable by: Mac, PC, iOS, Android, Kindle
  - Lightweight
  - Universal Web viewers
- Can have intelligence
  - Links in Revit can be maintained
  - Links in Cad can be read
  - Links in other applications (i.e. MS Office and Images) can be read
  - Hyperlinks are maintained
- Easy to mark up
  - Redline, Dimension and Track Changes
  - Web collaboration/ Shared Documents
    - Combine with Drop Box or other cloud storage



## Leveraging | Connections

- **Blink Forward** | <http://www.blinkforward.com/>

- Linked PDFs
  - Forward: View references jump to the correct sheet and location
  - Backward: Views list the other views that reference them
- Revision Tracking: What changed since the drawing was last issued
  - Addendum identification
  - Stream line estimating and constructability reviews
- View Tracking
  - Find views and details that are referenced, but do not exist
  - Find views and details that are drawn, but not referenced
  - See how many times a detail is referenced



- **DWF**

- Native Autodesk
  - Can be printed/ exported from any Autodesk product
  - Generally comes with your Autodesk software
- Integrates seamlessly with Design Review for Redlines and markups
- Linked Files from a single source for free every time
  - Cross referencing between files and projects is difficult at best
- Minimal integration with non-Autodesk platforms and data sets



- **Excel**

- This is the native central database (in my case)
  - Work remotely on the main data set without having to create extra links and work.
  - Best to have the ability to remote into a computer if you are going to work on the main database.
- Platform Inconsistencies
  - Transferring between Windows and iOS versions of Excel tends to drop or modify many of the complex formulas that are critical to this acting as a central database.





## Gestalt | Data Lifecycles

- Plan out your databases before you start.
- It is easier to start with a small data set and work up.
- Just because you can doesn't mean you should...



Super vs. Stupid

Information is the key to BIM. Without it you are just modeling in clay...



### References:



- Ideate BIM Link:
  - o <http://www.ideatebimlink.com/>
- Revolution Design:
  - o <http://www.revolutiondesign.biz/>
- Blink Forward:
  - o <http://blinkforward.com/>
- Data Sets:
  - o <https://www.dropbox.com/sh/8xcacrayuhzu8e6/y9dfiKY-3>



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