

Where's the BIM?

By F. Rutson Fuqua

The *Building Information Model* has been receiving a plethora of attention at a distance by many folks, albeit a goodly number of academic types and reviewers. An interesting observable fact is that precious little of the attention has been devoted to the *Information* part of the acronym. It is, in fact, the "I" part in BIM that gave birth to BIM. One reason for the current overall *Information* neglect may be that only Graphisoft makes the data extraction such an intuitive process. To produce quantities and information, one simply models the building elements then uses Archicad's built-in "*Interactive Schedule*" to extract the desired data.

Often when the BIM is discussed by participants in the business, it is talked about in wonderment and with great trepidation. The reception is somewhat like the cavemen trying to figure out fire and deciding whether or not it should be used. Another group of ney-sayers need to follow Einstein's lead regarding Tensor Calculus. In a letter that Einstein wrote on 29 October 1912 (*Albert Einstein Creator & Rebel*, by Banesh Hoffman) he said, "I have become imbued with a great respect for mathematics, the subtle parts of which, in my innocence, I had till now regarded as pure luxury." Many Architects regard plans in general, and specifically the BIM, as a pure luxury, even frivolous. The AEC industry desperately needs to grasp the necessity of this invaluable information. The significance of the model generated information is in its 100% perfection of extracted information. With BIM, the word "estimate" will lose its place in our day to day costing language. BIM is not an estimate, it is an actual, a simulation.

The *Virtual Building* (BIM) is, however, the process that will drive all that we do in the AEC industry and in all building related ventures. Recently I attended an AIA chapter meeting in Dallas. The program at the AIA meeting was *Web Construction Document Management*. The presenter (John Moebes of Good Fulton & Farrell, a Dallas architectural firm) told the AIA gathering that Good Fulton & Farrell would no longer accept any documents through a paper medium. Mr. Moebes contrasted paper to pixels and said that if the information sent to their company is not digital, it is simply not accepted. Believe it, or don't, companies are beginning to understand that if the communication is digital, the information can be analyzed and manipulated. Paper communications all have to be evaluated manually, therefore they can not be analyzed or modified efficiently.

I have been arm wrestling with an historic purveyor and manufacturer of magnificent high end hardware out of New York. All of their hardware quotes are prepared by hand then faxed to clients. We had a project that involved only about 50 doors which resulted in approximately 250 pieces of hardware. Each hand-prepared, faxed quote from this company had to be manually checked one line item at a time against my *Virtual Building* generated lists. I would make corrections to typos, mathematical errors, etc. They would redo the list and we would get an entirely new set of mistakes to manually check once again. Life no longer has to be so hard, expensive and wasteful of manhours. In the past, I have endured hardships such as this, only as long as I absolutely had to. When an alternate method or source appeared, I would change in a nano-second. -- This all being said, *here's the BIM*:

How is model hardware (or any type) information generated?

A model for the project is drawn which includes walls, room area names, and doors. Figure 01 is the dialog box used to apply settings for inserting a door into a wall. These settings include such inherent door properties as width, height, thickness, materials, door design, swing, jamb information, trim information, hardware location, sill, line color and weight, section fill, etc. The inherent settings define how the door is displayed in the drawing, be it, plan, elevation, section or 3d. Additional manual attributes can also be applied in this dialog box. Manual attributes have no effect on the display of the door, but are paramount in the extracted information world. In the case of the hardware schedule, the key manual attribute is the designation of the

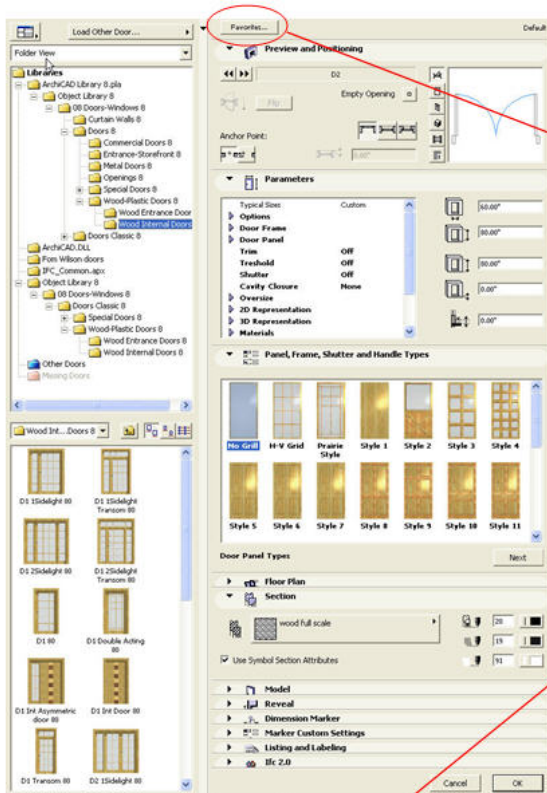


Figure 01

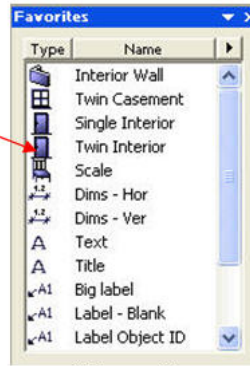


Figure 02



Figure 03

Door#	Room#	Hardware Assembly
B122	Rear Vestibule 122	Food Pantry A1
F108	Library Vestibule 126	Library A10
B110	Library Vestibule 126	Vestibule Storage A11
D109	Library Vestibule 126	Elevator A11
D106	Master Bedroom 132	Master Vestibule A2
B104	Master Vestibule 131	Master Bath A3
F119	Family Room 124	Kids Desk A4

Figure 04

Hardware Assembly. The many settings established in the dialog box can be saved as a favorite (Figure 02). To place this door with a favorite only requires selection of the favorite. The favorites, with all of the settings, can be used over and over as well as in other projects. Once the door is placed in the floor plan (Figure 03), elements can be extracted in Archicad using the *Interactive Schedule* (Figure 04). This listing, as the name applies, is entirely interactive. The door in the top row that is selected in blue has two elements that are manual and can be modified (highlighted in yellow) within the schedule itself. We can easily change the Door # and the Hardware Assembly designation. These elements are much easier to change in the schedule than to hunt around and modify them on the plans (which you can do, if you prefer). The elements in blue are inherent and can not be adjusted in the schedule, only in the plan. This is because the blue or inherent elements are the location of the door. These three elements in the schedule tell what room the door is in and which room it swings to and from.

The *Interactive Schedule* can easily be designed and/or modified (Figure05). The column on the left is a partial listing of parameters to choose from and place in the column on the right. All items listed on the right are what will appear in the *Interactive Schedule*. You can change the listing order, sum the columns, determine font and font size, etc. When the items are listed, that list can be placed directly in the plans or can be exported to Microsoft Excel (Figure 06).

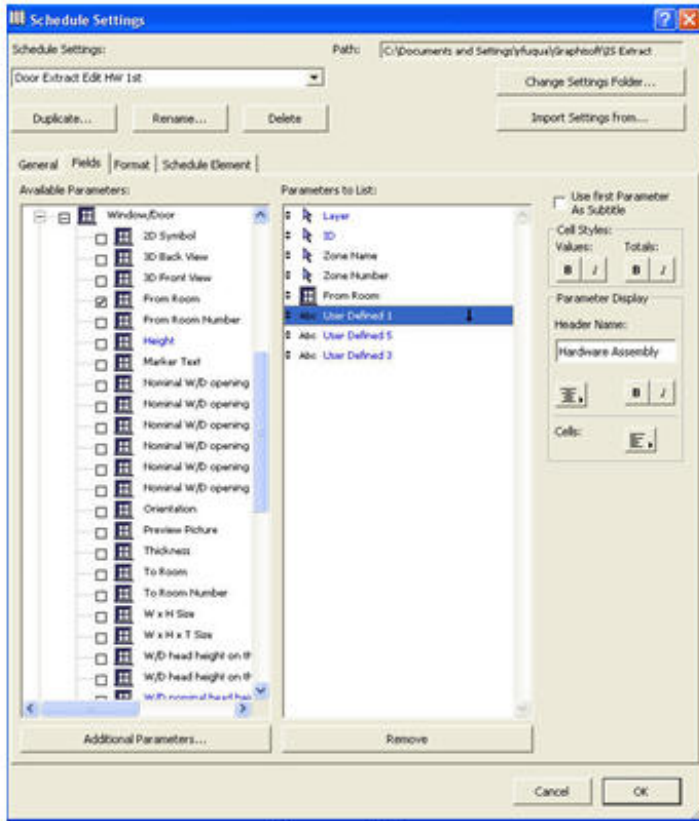


Figure 05

	A	B	C	D	E
1	ID	To Room	Room#	From Room	Assembly
2	B122	Rear Vestibule	122	Food Pantry	A1
3	F108	Library Vestibule	126	Library	A10
4	B110	Library Vestibule	126	Vestibule Storage	A11
5	D109	Library Vestibule	126	Elevator	A11
6	D106	Master Bedroom	132	Master Vestibule	A2

Figure 06

model#, the finish, and the price of each hardware item. Once the Archicad *Interactive Schedule* information is in the database, it can be viewed and sorted in a multitude of ways to represent the information in the best fashion for each person who needs to use and review it for approval or for purchasing.

The Hardware Assembly report is demonstrated in Figure 07. This report lists every piece of hardware that is used in each individual assembly type. When the assembly type information is combined with the specific information from the Archicad model, one result is

At this point, you could easily call it a lofty successful day. You have successfully created and placed a Door and Hardware Assembly schedule on the drawing and have exported this file in Excel format to the builder, the hardware vendor, or the decorator. The exhilarating part is that Archicad has 100% correctly included every single door that is in the floor plan along with which rooms it swings to and from and what hardware assembly is used on each and every door. Since this list is digital, no one among the consultants has to re-type or re-enter any of this data. They can enrich the list in any way that they see fit. Data, not paper.

But, since we are trying to find out *where the BIM is*, let's take this information one step further and dump the Excel file into a Microsoft Access database. In the database we have a table that defines each of the Assembly Types. We also have a table that defines each of the hardware items. The item list includes the Manufacturer, the

the listing of doors by assembly type (Figure 08). A report that is most meaningful to the client is the report that lists each piece of hardware sorted by the door number as in Figure 09. The project total of all the hardware is summarized in Figure 10. *Here is the BIM.* Minimal data entry, leveraged many ways to create valuable data that does not have to ever be re-entered. If a door is changed in the floor plan (model), all of the information associated with that door filters through the entire system. There is no data entry associated with changes. Anyone who has ever had to produce a complicated hardware schedule understands the time and difficulty involved by doing it the old way.

Assembly ID	A1	Formal Passage Closet					
8	710 1501	1 - Knob & Rose (Formal)	#70780A	P.E. Guerin	P.B.N.L.	\$188.25	
8	710 1900	1 - Safety Closet Turn	75120A	P.E. Guerin	P.B.N.L.	\$60.00	
8	710 3500	1 - Mortise Passage Latch	Pass-Latch	P.E. Guerin	P.B.N.L.	\$306.00	
8	725 10010	1 - Elbow Floor Stop	75160A	P.E. Guerin	P.B.N.L.	\$35.00	
	4					\$589.25	

Figure 07

Assembly ID	B7	Informal Twin Pocket			
Opening # J128	Room #108	Hall/ Mudroom	To	Exercise/Gameroom	
Assembly ID	B8	Informal Passage			
Opening # D137	Room #108	Hall/ Mudroom	To	Back Coat	
Opening # D129	Room #115	Exercise/Gameroom	To	Exercise Closet	

Figure 08

Opening #	B122	Room # 122	Rear Vestibule	To	Food Pantry	Assembly # - A1	
710 Door Hardware							
1 - Knob & Rose (Formal)			#70780A	P.E. Guerin	P.B.N.L.	@	\$188.25
1 - Safety Closet Turn			75120A	P.E. Guerin	P.B.N.L.	@	\$60.00
1 - Mortise Passage Latch			Pass-Latch	P.E. Guerin	P.B.N.L.	@	\$306.00
725 Door Hardware Stops							
1 - Elbow Floor Stop			75160A	P.E. Guerin	P.B.N.L.	@	\$35.00
4 - Items							\$589.25

Figure 09

8 Doors & Windows							
710 Door Hardware							
11 - Knob & Rose (Formal)	#70780A	P.E. Guerin	P.B.N.L.	@	\$188.25	\$2,070.75	
5 - Knob & Rose (Formal)	#70780A	P.E. Guerin	Polished Nickel	@	\$188.25	\$941.25	
34 - Knob & Rose (Informal)	#72970A	P.E. Guerin	P.B.N.L.	@	\$122.50	\$4,165.00	
8 - Knob & Rose (Informal)	#72970A	P.E. Guerin	Polished Nickel	@	\$122.50	\$980.00	
1 - Acanthus Knob & Rose	131	P.E. Guerin	D.O.G	@	\$475.00	\$475.00	
3 - Dummy Stud	#74860	P.E. Guerin	Steel	@	\$15.00	\$45.00	
4 - Dummy Spindle Nut	#75130	P.E. Guerin	Steel	@	\$6.25	\$25.00	
4 - Safety Closet Turn	75120A	P.E. Guerin	P.B.N.L.	@	\$60.00	\$240.00	

Figure 10

Now, gentlemen, that's the "I" in BIM!

BIOGRAPHY

F. Rutson (Rusty) Fuqua

Rusty Fuqua graduated from Trinity University in 1973 with a Bachelor of Arts. As a General Contractor, from 1973 to 2002, Rusty's passion has been to develop building and computer skills for estimating and project management. His experience as a builder and his computer skills provide him with the expertise to prepare exceptionally functional and complete construction drawings using 3D modeling for J Wilson Fuqua & Associates Architects in Dallas, Texas. In July, 2004 he received the top award in an International Competition sponsored by Graphisoft for "Best Practices". As a Contractor he has built and remodeled over 200 homes ranging in price from \$30,000 to \$3,000,000, apartments, and light commercial. As a Civic Leader he has served as President of the Texas Panhandle Builders Association, Chairman of the Amarillo Building Board of Appeals, member of the Amarillo Board of Review for Landmarks & Historic Districts, a member of the Amarillo Executive Club, and a member of the Southwest Amarillo Rotary.

Mr. Fuqua's essay for Graphisoft can be accessed at:

<http://download.graphisoft.com/ftp/pdf/accountability.pdf>

Various Archicad drawings and techniques by Mr. Fuqua can be found at:

<http://www.timeless-builder.com/ArchicadMenu.htm>

Various Residential Building Projects by Mr. Fuqua can be found at:

<http://www.timeless-builder.com>

