

## **THE EVOLUTION OF NOW**

By: F. Rutson Fuqua

Since the time that I started building homes in 1973 there have been more than a few shifts in the processes of building and architecture. I graduated from Trinity University in 1973 and in my last semester there I took a class called “Computer Application of Behavioral Science”. Little did I know that this class would shape the way that I would approach building for the next 32 years. I dreamed of the possibilities that the computer would provide for building. Since I did not have the same budget as Trinity University, my first computer did not have APL as the programming language, but was a TI alphanumeric programmable calculator. Data was entered through the keyboard or read into the machine by magnetic strips that were 2”x 8”. As I remember, each strip held about 4k of information and the machine had 32k of memory. I programmed this TI to track expenses on each project relative to what I had estimated the cost to be. Many in the business were fascinated that I was doing business on this odd machine. Looking back, this was a pretty barbaric way to do business, but it was about the only practical option. Also in 1973 Royal had just produced the first digital calculator that could do the 4 fundamental math functions (add, multiply, subtract, and divide) for \$98. Everybody loved being able to ditch the slide rule and legal pad for this digital advancement. With my calculators I checked invoices received from the vendors which were still being calculated in the margins by hand. Technology truly was on the advance.

Architecture was pencil and paper in 1973. I bought a contraption called a drafting machine. This machine consisted of 2 rules, perpendicular to each other, on a mechanical arm that could lock at various preset angles. This was much more sophisticated than the traditional T-square and triangle. Architectural design was just recovering from “Ranch Style” home designs in 1973. The first house that I built, sold for \$16/SqFt which had been the price for many years. Building and Architecture had till 1973 remained on a fairly steady course with minimal changes. A small number of people would follow Thomas Jefferson’s lead, travel to Europe and return to the US with inspirations for building designs. Global communication was slow. All of this, however was at the tipping point. Technology, interest rates, and communication were starting to make unprecedented changes.

Few people knew what loomed on the horizon in 1973 when Gary Kildall wrote a program called CP/M (Control Program/Microcomputer) which enabled read and write capabilities to a floppy disk for the first time. Nothing has been the same since. In 1977 I replaced my TI with an IBM Series/1 minicomputer which was by no means “mini”, being 6’ tall, 2’ wide, and 2’ deep. The programming language was EDL and when I took delivery of this beast the only programs on it were utility programs for file management and programming. I hired a consultant to write a program for accounting and I wrote programs for everything from scheduling and estimating to cost analysis and word processing. My ability to properly handle costing numbers gave my customers a high level of confidence that set my building business apart from the masses. My IBM was cool stuff, but, I sensed that this was only the beginning. I made numerous programming attempts on the IBM to create assemblies of construction types to automate

estimating, but the progress was tedious and quantification was still a manual procedure from blueprints to hand entry into the computer.

In 1983 a friend told me that he had seen a program that would allow you to draw with the computer! So, in 1983, I bought a Compaq computer, Lotus 123, Word



Perfect, and AutoCAD. I continued to use my IBM for accounting & estimating, but I was now able to throw away that silly drafting machine. As AutoCAD progressed I began to use AutoCAD to export block attributes to spreadsheets. Several of the Architects that I employed were beginning to use AutoCAD. In 1995 I connected to the WWW so I could efficiently build 3 pairs of solid brass French doors for a project. I produced shop drawings for Revere Copper (Rome, NY) to extrude brass parts

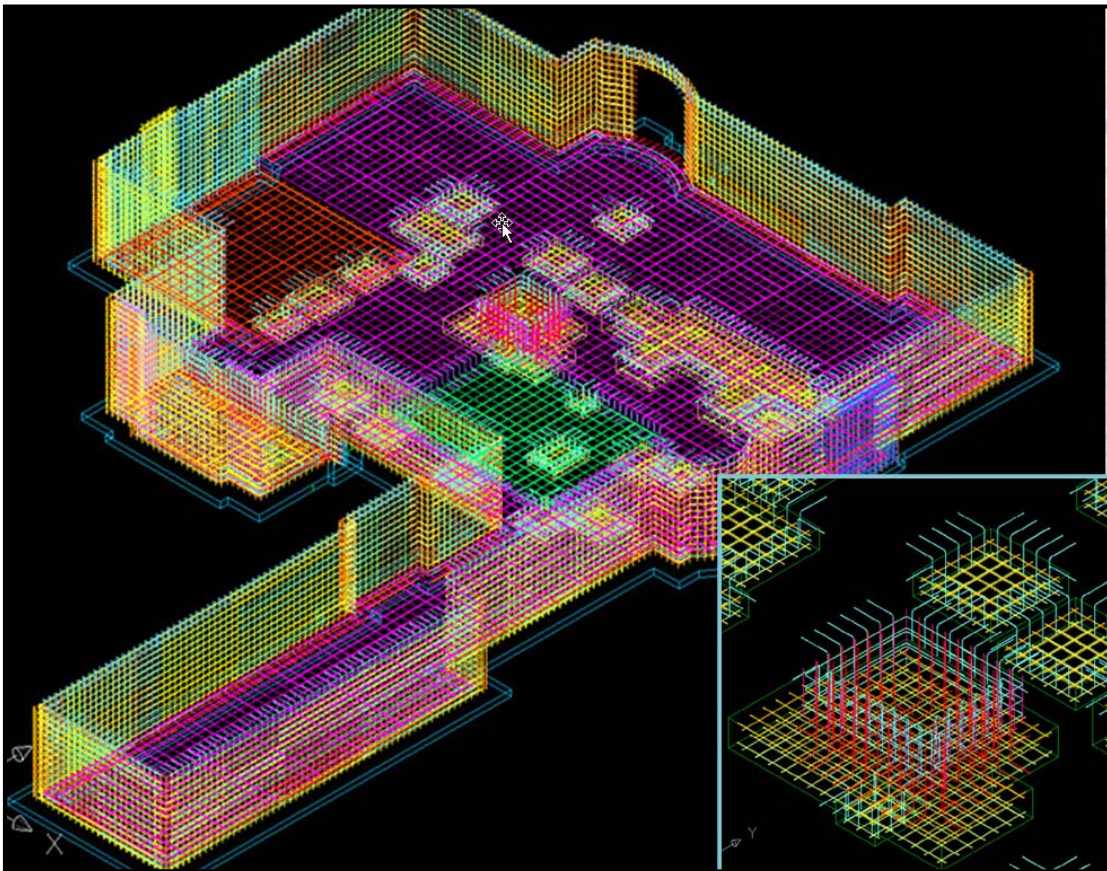
that were assembled by master clockmaker (Taos, NM). Without the WWW and CAD this project would have been very difficult, costly, and time consuming.

For the last several years many say that the Building Information Model will be utilized in the future. This October I went to the Silicon Valley of Europe (Graphisoft Park in Budapest, Hungary) to attend a Key Client meeting. I met people there from the UK, Canada, Holland, Finland, & the US who are all using BIM to the max. Ben Wallbank of the UK gave a presentation entitled "The Diminishing Role of the Architect". He said that because Architects in general have technophobia, new positions in the industry are taking over. Project Managers, once unknown, are filling gaps for wary clients. Design-build companies are becoming plentiful. 3d modelers are coming into being as a new force. Since the time that I became directly involved in the architectural process in 2002, many architects believed that the exacted information

produced by a model creates a huge target for litigation. Mr. Wallbank has proved through his work that BIM is, in fact, Professional Indemnification against litigation because the product is proven through simulation before the plans are tried on the project itself. He further has proved that 3d modeling makes the architect deal with the “Hard Spots”. Defining and proving the difficult areas eliminates the contingencies added by contractors that are afraid of the unknown and undefined. Ben stated simply that modeling “Saves the Blushes”.

The internet has accelerated, at an accelerating rate, the development of the Building Information Model. The internet has made sharing of ideas and products across the globe instantaneous. After returning from Budapest, I received a request from a lumber yard to produce quantities for their contractors. One hour later, I received a call from architectural modeling firm in India (as a result of my last Cadalyst article). Graphisoft’s Constructor package will provide a solution for the lumber yard with an architectural firm on the opposite side of the globe.

Below is an example of the power of the Building Information Model. A 3d model of reinforcing steel used as shop drawings and for quantification and for clarity of



communication. It is not possible to produce enough 2d drawings to communicate what is demonstrated in this model. And, the quantity produced is 100% perfect! The model “saves the blushes”!

BIM is globally NOW. So, what is the future?

Banks do everything in their power to reduce their loan risk. Therefore, banks will offer preferential rates for projects with BIM. Why? Banks prefer loaning money on collateral instead of unknowingly loaning money on couches, drapes and contingencies. Insurance companies will offer preferential rates for projects with BIM. Why? For the same reasons as banks plus the benefits derived from having a model to reduce their expenses to settle claims. In the New Orleans hurricane disaster, insurance companies have to pay adjusters, in some cases, a fee of 25% of the actual loss. If the insurance companies had a model, all they would have to do is update prices for the known quantities that already exist in the model. The model will produce quicker settlements, based on actuals. In large disputed claims, insurance companies spend millions to quantify and prove their position. --- The Building Information Model provides a solution that is exact for all involved with no shades of grey.

## **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. 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>