Editorial

Preparing a Profession for BIM

A Sense of Urgency

By Will Ikerd, P.E., C.W.I

A "sense of urgency" is what compels most people to change, and so it is with the majority of structural engineering firms confronting Building Information Modeling (BIM). In a recent national survey of structural engineers and BIM, over two-thirds responded that they would have to use BIM within the next 24 months or sooner to meet their clients' needs. The urgency is emphasized further considering almost half responded that they currently need to be using BIM.

The survey was conducted earlier this year by the SEI-CASE joint committee on BIM, in cooperation with the Structural Engineers Association of Texas (SEAoT) that originally authored the survey. This survey is among the first to focus on structural engineering by non-biased organizations dedicated to the profession, and is representative of the steps which these organizations are taking to help prepare the profession for the rapid adoption of BIM.

The process of transitioning to BIM is typical of most new technology adoption life cycles in the current age, as described in Geoffrey A. Moore's book *Inside the Tornado*. Moore's 1995 business marketing book is a current view of a business model that originally grew out of research from the late 1950s. The author provides insight into the way business markets respond to change with rapidly developing technology. The survey, coupled with the history of similar technology changes in other industries, convinces me that the structural engineering transition to BIM will be viewed as a historic period that primarily took place between 2000 and 2015. While earlier work was being done in BIM by others, BIM did not have a noted presence in the design of buildings and bridges before this period. Pertinent questions arise: What is the significance and relevance of this change to practicing structural engineers? What might the structural engineering office look like in 2015? What would be the challenges as well as the opportunities firms will face? Answers to these questions are part of the mission of the SEI-CASE joint committee on BIM.

Many are already aware of the advantages of BIM. These advantages are adequately documented by software companies and include better coordination, improved visualization, and clash detection along with many others. The SEI-CASE committee is certainly aware of these, as well as the challenges of BIM. The change to BIM provides both opportunities and obstacles, and engineers must manage the challenges to leverage the benefits. Liability issues are commonly cited when structural drawings are digitally passed to subcontractors to produce shop drawings (taking the models "downstream"). Opponents of downstream model usage point out that it saves costs for the subcontractors at the expense of the engineer. The large learning curve with BIM that is common with most technology changes could make the first group of BIM projects unprofitable. The survey indicates that an average of 160 to 240 hours of billable time per person in the first year is lost in training staff to the proficiency level required to work on active projects. Also, BIM can give a false sense of accuracy when items are easily modeled incorrectly with great precision and high levels of detail. Additionally, opponents of BIM question how fast the technology will actually advance, disputing the 2000 to 2015 timeframe due to the learning curve, the investment in time, cost, computer hardware, training, and possibly additional personnel. I am not sure that this last view fully appreciates the forces on our profession to move to BIM, from software companies currently pushing and the developing pull of owners, architects, contractors, subcontractors, building officials, and governments.

> *"...a framework for combining much of the structural engineering information for all aspects of a project in one digital relational database."*

Another unintended consequence of BIM is that for the first time we see a framework for combining much of the structural engineering information for all aspects of a project in one digital relational database. Thomas Friedman pointed out in his 1999 bestselling book *The Lexus and the Olive Tree* that professions that organized their data in digital relational databases will very soon after begin outsourcing notable portions of their work. This is especially the case in professions with a shortage of local staff. Friedman documents examples from other professions which could be easily paralleled in certain segments of the structural engineering profession. A noteworthy example of globalization that Friedman provides are of digital MRI's of the human brain sent to medical doctors overseas for interpretations and mapping, and then returned to the US in less than 24 hours.

The SEI-CASE joint committee on BIM strives to answer these questions, along with many others that have surfaced in the structural engineering survey on BIM and that we have received from other structural engineers. The committee has targeted subcommittees that are actively working to prepare the profession for the challenges and opportunities which BIM brings us. Our subcommittees include the following: BIM Implementation, Interoperability of BIM Software, BIM Development Software and Training, Legal and Contractual, Production Process, National BIM Standard liaison, AGC BIM Forum liaison, AISC IT Committee liaison, and Academic subcommittee. One of the first publications of the committee will be a report on BIM and a review of the survey of BIM in Structural Engineering.▪

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