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In This Issue:

AIA Technology in Architectural Practice Conference--Part 1

This issue of the AEC Tech newsletter was originally scheduled to be Part 2 of the two-part sequence exploring Autodesk Architectural Desktop (ADT) 2004, started in the previous issue (see Issue #107: http://www.cadenceweb.com/newsletter/aec/1003_1.html). However, I have just returned from the AIA Technology in Architectural Practice conference, held in San Francisco from Oct 16–19, and the conference was so exciting and so highly charged that it seems imperative to capture it in words right away. I'll present the main topics of discussion at the conference in this issue, and will devote the next issue to the details of some of the individual sessions that I attended. I'll get back to Part 2 of my exploration of ADT 2004 in Issue #110.

For a write-up based on my own session at the conference entitled "The Potential of Digital Building Modeling," presented jointly with two experts, see the "The Expert's View" column in the Nov 2003 issue of the A-E-C Automation Newsletter (http://www.aecnews.com).

About the Conference

Unlike the national AIA convention held every summer that addresses all aspects of architectural design and professional practice and is attended by thousands, the annual AIA Technology in Architectural Practice (TAP) conference is focused primarily on the application of computer technology in architectural practice. The attendees run in the hundreds rather than thousands, and typically include technology leaders in architectural practices, IT consultants, software developers, academic researchers, and the technology enthusiasts in the architectural profession. While there is some software on display at vendor tables, there is no Expo floor as such, and the majority of the conference is devoted to presentations, discussions, and networking. The smaller size and more focused nature of the conference contribute to an invaluable learning experience.

The theme of this year's AIA TAP conference was, "Connecting the Dots: Understanding the Emerging Digital Building Process" (see http://www.aia.org/tap/conference/2003). The majority of the presentations, as well as the ensuing discussions and questions, were focused on exploring the newly emerging concepts of building information modeling (BIM) vis-à-vis traditional 2D CAD processes. There was a collective recognition that the building industry is on the cusp of a new phenomenon, and the atmosphere was rife with enthusiasm, excitement, and the eagerness to learn more. The organizing committee (Jonathan Cohen, Jill Rothenberg, Nancy Yen-wen Cheng, Jim Bedrick, and Stephen Hagan) did a terrific job of putting the conference together, with the perfect blend of industry presentations and academic research, of vendor approaches and user perspectives, of government initiatives and private enterprises, and of current issues and future visions. There was something in it for everyone.

Technological Aspects of BIM

Several key aspects of BIM were discussed and debated at various sessions throughout the conference. The technology itself came under a lot of focus. In a joint session, software executives from the leading vendors, Autodesk, Bentley, and Graphisoft, described their corporate visions, their BIM solutions, and their future strategies. While nothing fundamentally new was said that I haven't written about before in articles devoted to the BIM perspectives of each vendor (see the articles under Relevant Links), some interesting points emerged. It has often been argued that because every building is unique, the building industry cannot reap significant benefits from the modeling approach as the manufacturing industry has done. However, about 80% of the inputs to a building are, in fact, repetitive, which makes a strong case for the deployment of BIM. It was the plant design industry that implemented 3D modeling first, and designers there reported that modeling made them better professionals and gave them the ability to do their work more effectively. Professionals in the building industry will likewise find this to be the biggest benefit of BIM. Responding to a question on designers wanting to create complex and interesting forms without being straitjacketed by the form-making limitations of BIM solutions, all three vendors expressed the continued focus of their solutions on data integrity rather than form. Essentially, this means that designers creating free-flowing organic forms would have to continue relying on general-purpose 3D modeling software such as Catia or form•Z. BIM solutions like Autodesk Revit, Bentley Architecture, and ArchiCAD could, however, be gainfully used for the vast majority of buildings that use regular building components.

Another significant area of discussion was the polarity between integration and interoperability. Recall that in my cover story "Should We BIM? Pushing the State of the Art in AEC" in the June 2003 issue of CADENCE (http://www.cadenceweb.com/2003/0603/coverstory0603.html), I posited that the ultimate success of interoperability efforts such as the IFC would depend upon how the AEC industry evolves. If the industry continues to be dominated by one or two large companies, they will eventually develop integrated suites of applications around their BIM solutions and interoperability would become less critical; on the other hand, if smaller companies with effective BIM solutions attract a large client base, interoperability would gain in importance as a means to integrate these solutions with third-party applications. The same concept was presented at the conference as a graph between integration and interoperability, and attendees were asked to vote on which they felt was more important. Interoperability won by a large margin, of course, since "closed" and "proprietary" are generally regarded as bad words these days. However, this should not undermine the importance of integrated suites of applications, which can be very powerful in tackling a set of defined tasks with the highest level of speed, accuracy, and data integrity.

When posed with the integration versus interoperability question, all three software vendors expressed their belief in and commitment to both principles. Autodesk did come in for some flak for not bundling IFC support for ADT with the application, and instead, making customers rely on a third-party IFC translator. When questioned about IFC support for Revit, Autodesk stated that because Revit was still a relatively new product in the early adoption phase, plans for IFC support would be premature. Despite their support for interoperability, all the vendors also emphasized that the internal data structures of their products were proprietary, which means that data cannot be exactly mapped between the three main BIM applications.

Other Topics of Discussion

Apart from the technology, a key topic of discussion was the legal barriers to BIM implementation. Several attendees expressed a fear of litigation in switching to model-based design, as the deliverables are

bound to change and the standards for BIM still have to be set. Needless to say, our contract documents have to be rewritten to reflect the new way of designing, constructing, and maintaining buildings using intelligent 3D models rather than 2D CAD drawings.

Who will be the main agent of change to push the model-based approach? There was no clear agreement on this question. Some felt that it would and should be the owners commissioning buildings, particularly long-term ones, since they will be the greatest beneficiaries of BIM, saving costs on design, construction, and operations, all through the building lifecycle. Others disagreed, and felt that the bigger construction companies are going to start working with 3D models and dictate process changes to the other building professionals. In any case, design-build will become more common, instead of the current design-bid-build procedure, which is inefficient as well as quite illogical.

One of the main reasons why the building industry is hopelessly behind other industries in technology adoption and efficiency is that there is no single party in charge of managing the entire process from concept to completion. The role and scope of the present-day architect is far removed from the "master builder" of the past; however, the adoption of building information modeling can conceivably create a new role, that of the "information master builder." Whether the architectural profession is smart and savvy enough to step up and take on this critical role depends upon the lead it takes in adopting and implementing BIM technology. The opportunities exist; they just need to be seized. BIM can be implemented on small pilot projects to start with, and the current economic downturn actually presents a great time to provide employees with the necessary training on the new tools.

What's in a Name?

A number of presenters as well as attendees at the conference expressed their dislike of the acronym BIM for describing the model-based approach to building representation. While I personally don't mind the term, I'd like to throw open the debate to readers. If you don't like the term BIM, can you think of a better acronym to describe the new model-based processes that will eventually replace the term CAD? Send in your suggestions to me, and I will publish them in a future issue.

Stay tuned for more on the conference in the next issue.

Relevant Links

AIA Technology in Architectural Practice 2003 Conference:
http://www.aia.org/tap/conference/2003/

AEC News Tech #90 (Jan. 29, 2003), "Building Information Modeling Gains Momentum":
http://www.cadenceweb.com/newsletter/aec/0103_2.html

AEC News Tech #94 (Mar. 27. 2003), "A Federated Approach to Building Information Modeling":
http://www.cadenceweb.com/newsletter/aec/0303_2.html

AEC News Tech #95 (April 10, 2003) "The Great BIM Debate--Part 1":
http://www.cadenceweb.com/newsletter/aec/0403_1.html

AEC News Tech #96 (April 24, 2003) "The Great BIM Debate--Part 2":
http://www.cadenceweb.com/newsletter/aec/0403_2.html

AEC News Tech #97 (May 14, 2003), “A 20-Year-Old BIM Solution”:
http://www.cadenceweb.com/newsletter/aec/0503_1.html

CADENCE magazine, June 2003, “Should We BIM? Pushing the State of the Art in AEC”:
http://www.cadenceweb.com/2003/0603/coverstory0603.html

About the Author

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