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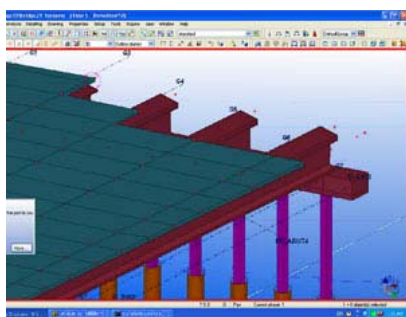
Ten Minutes With The Godfathers of Bridge Information Modeling

08/12/2009

By [Aileen Cho](#)

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Senior Transportation Editor Aileen Cho sat down recently with Stuart S. Chen, professor of civil and environmental engineering at the State University of New York at Buffalo, and Arun M. Shirolé, a senior vice president of bridge engineer Arora and Associates, New York City. They discussed the origins of Bridge Information Modeling, why they believe it's needed to integrate design and operations management, the role of vendors and where it goes from here.



View of a Portion of the Bridge Computer Model



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What is Bridge Information Modeling?

AS: It came about back in the late '80s. I was visiting a think tank operation, a consulting group to NASA. I saw a model of the space station and saw how they would deal with any problems, design repairs, etc. I thought: "Why not something similar for bridges?"



CHEN

It is a 3D concept for design and construction, maintenance and operation, and data. The system deploys that data as needed, allowing for real-time use as the conditions change throughout the bridge life-cycle.

How did the term "Brim" originate? Clearly it's a version of BIM.

AS: Dr. Chen and I have been working together on research projects [since 2001]. The first was with the NCHRP. The second was from the IDEA program...out of that work came this idea of BrIM. Dr. Chen said, "Well, there is BIM. Let's put an R in it."



SHIROLÉ

SC: BIM was coined shortly after 2002. At the time I thought: "Yes, this is what we are talking about. It would be nice for us to have a concise acronym." Many of the concepts are the same [as BIM]. Reuse of information, interoperability between software stovepipes, "islands of automation" and linking different parts of the architectural/engineering/construction life-cycle. Except, we don't have the A part.

But why do some engineers think BrIM isn't

necessary?

AS: Bridge engineers see design, construction, operations and management as distinct functions. Seldom do they cross lines...people don't realize the benefits because they don't see the day-to-day problems. This is a holistic cradle-to-grave asset management approach. It's a different ballgame. Engineers do quite well in project decision-making. But now we have to manage networks of bridges.

Elaborate on why BrIM IS necessary.

AS: We've finished 50 years since the Interstate was built. We're in the renewal era. This is where we recognize we have to look at a bridge as an asset from the beginning. When I first started talking about bridge management, people laughed at me and said it was a waste of time.

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Give me a scenario for how it would improve bridge management.

AS: Let's say you're doing inspections on a major crossing. A red flag comes in. When I was in Albany, what we needed to do was go back to the drawings, find the location, figure out what needed to be done. In this scenario you have all that at the tip of your finger. The inspector will have a handheld device with which he takes a picture and transmits it to Albany. You can analyze the situation much faster. Faster action is critical.

At the 2008 IBC conference, Dr. Chen, you were asked about geotechnical aspects of BrIM. Any updated response?

SC: Some of the things the questioner had in mind were a bit beyond what we were doing then. But it is quite reasonable to include soil boring data, blow counts, geotechnical assessments of bearing capacity. Some state DOTs already require bridge substructure data to be supplied in 3D form to reference into their maps. The contractors in turn can update their digital terrain models through their GPS-controlled equipment.

When doing survey data for road design, it's a logical and relatively small step to say, "Okay... why not go below the surface?" I admit that at this moment we've not yet incorporated that. It's on the ongoing list of software upgrades.

What is the status of your Federal Highways Administration research project on integrated bridge project delivery and life cycle management?

AS: It's up for advisory panel review. Comments will come back after August, then we're out on the road...half-day presentations for bridge engineers and two days for those who work with everyday bridge operations.

What would you like to see as the next step for BrIM?

AS: I'd hope there will be at least one or two pilot projects...the first avenue would be in a design-build scenario. That's where the low-hanging fruit is.

SC: I'd like to see a better industry-wide, collaborative and substantive effort at defining life-cycle data standards.

What about the vendors?

AS: Vendors like Bentley and Autodesk are pieces of the puzzle. From an in-the-trenches viewpoint, obviously we have to work with the commercial vendors and we need to tell them what we want. Many people use different parts—visualization, for example. The pieces are there, but it's fragmented.

Are you optimistic?

AS: Knowing how the industry works, it's going to take more than five years. But it has to happen. The world is going this way. Or, you could stick your head in the sand.

SC: In the bridge world the owners, transportation departments, etc., simply by transitioning to mandating some form of modeling delivery — that will be an irresistible force.



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