The ArchRecord Interview: SOM’s Carl Galioto and Paul Seletsky on BIM

Interview by Bryant Rousseau

Carl Galioto, Skidmore, Owings & Merrill’s partner-in-charge of the firm’s New York Technical Group, and Paul Seletsky, SOM’s director of digital design, are two of the architecture profession’s leading experts on BIM: building information modeling (also commonly referred to as virtual design and construction).

The pair discuss how BIM facilitated a major redesign of the Freedom Tower; assess the technology’s strategic impact on the profession; address common misperceptions; explain BIM’s potential benefits for smaller practices; point out how BIM can lead to increased compensation for architects; and lay out the potential ramifications of BIM—both positive and negative—on the architect’s overall role in the realization of buildings (“I believe this moment is a very critical hinge in the history of the practice of architecture—and that architects do have the ability to take a much greater responsibility in the implementation of their designs”).

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Bryant Rousseau: Paul, in an essay on building information modeling, you wrote that there is a “tremendous cultural shift occurring ... architectural production methodology is about to be turned on its head.” Can you elaborate on that? At the 10,000-foot, strategic level, what impact is BIM having now on the way that the profession is practiced?

Paul Seletsky: Traditionally, we’ve had a very linear process in the way we practice architecture. One goes from the conceptual to the early stages of design and into development and so on. What we’re seeing now is we’re going into a more elliptical process.

As a very good example, take specifications—which is traditionally coming as a post-rational application to something that has already been designed. But what we’re going to see is where the specifications become embedded into the rules of a building information model. We’ll see more and more examples of taking knowledge and applying it at the very early stages of design rather than applying it later.

Bryant Rousseau: For an architect who has been practicing for 15, 25, 35 years, what are the changes that might be a little bit uncomfortable to make as a result of this new way of doing business?

Carl Galioto: One can ask: What is the effect email has had on business over the last 20 years? BIM, or virtual design and construction, is a similar kind of huge shift on how information is created, how it is shared—and we simply need to look at this as a new way of working.

Bryant Rousseau: What is the most common misperception among architects about the implications of BIM?

Carl Galioto: Some of the changes that are necessary would be to exhibit less of a concern for liability, less of a concern for ownership of information, and to operate in a more open and collaborative environment with material fabricators, with the constructors, and with consultants.

Bryant Rousseau: And what sort of a cultural shift does that entail for the architect who might not be used to that sort of collaborative work?

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Bryant Rousseau: Carl, what’s your assessment of what the strategic impact will be?

Carl Galioto: I think the first question that comes to architects’ minds is, “BIM looks great, but how much more will this cost us?” The answer is, once one overcomes the initial hurdles of the initial implementation, it doesn’t cost any more. So that’s the first misconception.

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BR: Looking three years down the road, five years down the road, how is the architecture profession going to be different as a result of BIM?

PS: Well, we’ve already seen examples of its [implications] with projects both large—such as on the design of the Freedom Tower—and small as well. We did a school [the Koch Center for Science, Math & Technology at Deerfield Academy; see the slideshow], where there was a skylight system that needed to be designed [so that] a point of light was cast in a figure eight on this wall over the course of one year. We had to study the form of the skylight that would enable that point of light to be cast. When we arrived at that form, it wasn’t because we liked the shape of the form, or we thought aesthetically it was pleasing. It was actually a performative design. And the whole nature of performative design is going to take on a much greater significance.

BR: It’s interesting, Paul, that you mention using BIM on a school project, which was on the smaller side. Is that a common misperception, that BIM is really for large, extraordinarily complex projects and not something that if I’m designing a church in a small town or a single-family home that I will ever need? Does BIM deliver benefits for small, relatively simple projects?

PS: Absolutely. I was at a round table about a year ago and someone stood up and said, “Well, you’re with a large, well-known firm, and you can afford BIM.” And I said BIM is the greatest thing for a young architect that ever existed. There’s more opportunity here for the single practitioner and the small firm than ever before. Tremendous. And so to say it’s just for the large firm is a terrible misconception.

BR: Why does it pose so much benefit for the smaller firm?

PS: Look, one can look at the Internet as a means to accessing knowledge that we’ve never had on such a global scale. BIM offers an equivalent level of accessibility of knowledge—and that is really what’s the transforming instrument here. And that is available to a small firm as well as a large firm. The question is: How do they utilize the knowledge? And if they’re smart, whether they’re large or small, they’ll take as much knowledge and rethink the process. And in doing so, rethink the role of the architect.

BR: When it comes to BIM’s impact on the stature of the architecture profession, two dramatically opposed potential outcomes have been discussed. One is that architects, as a result of BIM, really assume a new leadership position in the industry. The other is that they become subsumed into the engineering and construction process and play a more secondary role. What do architects need to do to make sure they’re utilizing BIM to achieve a new position of leadership within the industry?

PS: If architects merely see BIM as a means to a more efficient production of representational documentation, then they will, I believe, lose out to construction-management firms. If architects merely see BIM in terms of geometry, and they forego understanding the really significant part of this—which is their role in a greater understanding of simulation and analysis—then they will lose a tremendous opportunity really to elevate their stature and their responsibility.

What architects are powerful at is the interpolation or the interpretation of a range of solutions or a range of ideas. It’s not black-and-white—“Well, if we press this button, we’ll get this answer.” It’s really taking the technology to get a range of answers, and then allowing ourselves to interpret what we have at hand.

CG: I believe this moment is a very critical hinge in the history of the practice of architecture—and that architects do have the ability to take a much greater responsibility in the implementation of their designs. Architects and engineers are the conceivers of ideas, and we should be responsible and take full responsibility for the implementation of our designs by interfacing with the fabricators of structural steel or building curtain walls and to work from our models, working with them to collaborate with them in the design and fabrication of the systems.

PS: BIM also doesn’t necessarily portend a competition between architects and engineers. What BIM does, and what simulation and analysis does, is raise the level of the discussion among all these existing participants. I don’t think we’ve yet fully grasped how the level and nature of collaboration between these parties will be transformed. We still see this in a very linear fashion. Once we see this in a different way, we see the roles of all these participants as still there, but the way in which they collaborate will be changed.

CG: I’ll give you a simple example: the use of various analytical tools for thermal performance on building envelopes. We as architects are using that to analyze our building envelopes and we’re using the same tools to study daylighting of spaces. And it isn’t for the purpose of replacing the MEP engineers; it’s to have a more informed, more productive dialogue with these engineers and to advance that up to a higher plain.

Want to hear what Galito and Seletsky think about how firms that use BIM might increase the compensation received from owners? Or what will drive interoperability? About BIM’s assistance when SOM had to move the footprint of the Freedom Tower? Read all this and more on page 2 of the interview.
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BR: What about the software itself? Where is it falling short now from where you expect it to be in a few years?

CG: I have one word for where I believe all the software falls short: interoperability. One can always find the software that can deal with curvilinear forms best, or that deals with interference checking best, or daylighting. The issue right now is that there isn’t one software that can do all of these things. And consequently, we need the various applications to talk to each other and to move data from one to the other in a seamless, interoperable manner. We also need for these applications to accept data. That is absolutely at the top of the list: to cut down on the frustration and for the applications to work together in a harmonious environment.

BR: What is going to drive interoperability? Large firms banding together? The AIA? What’s going to have to happen to achieve interoperability?

CG: I believe that the marketplace will drive it, and the marketplace which drives it is the clients. The clients will drive this. Whether it’s the GSA, whether it’s other government agencies, they will drive interoperability. Simply to wave one’s hands and say all applications must be interoperable is not a realistic criteria. But to specifically look at the need for interoperability and to what’s the nature of interoperability and the purpose of the data, then that will enable architects, engineers, and the software developers to begin to further develop the interoperability among these applications to meet the clients’ needs.

BR: Speaking of owners, how can BIM change the financial relationship, for better or worse, between architects and their clients?

CG: In my opinion, it is necessary for architects and engineers to demonstrate that the contributions we’re making in this design process is bringing greater value to our clients. If we demonstrate that we bring enhanced value, we’re entitled to greater compensation. Now, hopefully, that’s the outcome. I’m an optimist. If we can demonstrate there is an improved quality of the design, if it’s demonstrated the designs are more cost effective and that, in fact, construction durations are reduced by this greater efficiency, then we as a profession will be in a better position to seek more appropriate compensation.

BR: Carl, you specifically mentioned the GSA and government agencies. What about commercial developers and owners—are they currently pushing BIM adoption?

CG: Not the commercial owners yet, and by commercial, I’m looking at, the developers of, let’s say, office buildings in New York. However, the owner-occupied buildings—those clients are beginning to realize the benefits of BIM. And some of our public-sector clients are requiring a building information model that could be interoperable and to work with facility-management applications. That’s just beginning, probably within the last year, that we’ve seen that in RFPs.

BR: How are the legal and insurance issues either speeding up the adoption or being an obstacle to it?

CG: I’m pleasantly surprised by the fairly rapid resolution that is going on right now regarding these particular issues. And certainly the AIA is moving quickly with its modifications to owner-architect agreements and regarding transmission of data. Internally, our general counsel has developed language in our contract that is being accepted by clients and by construction managers. And, at their end of the table, the owners and construction managers understand the value of what they’re gaining to their project by the acceptance of these various provisions on the ownership of the data, or the acceptance of responsibility once they accept the data. This is such a compelling movement that people everywhere in the profession, even the extended profession, are understanding this, and the issues are being resolved.

PS: I believe the insurance industry likes predictability. We all like it. We don’t want to be caught off guard, and we don’t like surprises either within the design process or out in the field. If anything increases that level of predictability, everyone stands to gain. If I go to a doctor, I don’t want any guesses from the doctor, I want to go to a professional practitioner who I know has a great degree of knowledge and can predict to a certain extent better than a non-professional can. This is where the role of the architect will be enhanced if this process is changed not only with the geometry but with the performance integrated in that geometry. Everything should be predictable to a degree, and the level of knowledge should be raised between the architect, between the engineers, between the construction manager, and certainly with the owner.

BR: You mentioned the Freedom Tower a little bit earlier. Can we talk about BIM’s use on this specific project? I’m...
guessing that when you found out the footprint had to be substantially moved for security reasons after the design process had started that BIM really facilitated that change—that it was less traumatic than it might have been without BIM?

CG: It certainly was a help. Some of the building elements were able to be retained in the inner workings of the overall building. There was a great deal of effort put up front in the project and that is part of the change that we’re experiencing—that there’s a much greater investment up front than there is in other projects. So therefore, in schematic design, one must begin to develop the building core, the routing of streets and avenues vertically and horizontally, the building services, the interaction with the structure. So since that information is so well advanced at an early stage, we were able to take much of this information and to be able to save it in the building core. And it was retained at a very high level of value. So it did facilitate—although, overall, it was still a great deal of work to redesign this building. But there were elements that were already well thought out that were able to be retained.

PS: But the interesting part of Freedom Tower is that when we started to use [Autodesk’s] Revit, for example, on the first design, it was not to study the overall building, but for the team to understand all of the sub-grade conditions that existed on the site. And this is a great story in that Revit was introduced into the firm because people were able to see all of the infrastructure, and all of the layering of the infrastructure, that existed within the sub-grade conditions of the site. That drove us to move further and further into use of building information modeling. It wasn’t that we thought, “Oh, gee, let’s design the building with building information modeling.” It was more: How do we understand what’s there? We can’t see this through flat drawings. We can’t really see the internecine web of conduits and water mains and subways and so on.

BR: I’ve read that some of the firm’s members were so happy with what they were able to do with that element of it, that they were asking, “Can we use Revit for the rest of the building?”

CG: That’s exactly what they asked me. Trying not to overreach, I had asked the team simply to study the below-grade conditions, and that went so well on the first design, they asked if they could study the core up to the lower mechanical levels. And then it was easy for them to work on the rest of the core to the top of the building. And once we got that far it became pretty simple to model the remainder of the building because we had already worked out the most difficult parts. It was very interesting to see the quick evolution.