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Architects Move Belatedly Toward the Light **by Scott Simpson, FAIA, LEED® AP, Managing Principal, Cambridge**

Design is all about change—using new technologies, materials and ways of thinking to solve problems and create value for clients. Ironically, while architects are experts at inflicting change on others, they traditionally are reluctant to embrace fundamental changes in how they conduct their own practices.

Designers were among the last professionals to embrace computer technology as a core business process, and the architecture-engineering-construction industry still uses many archaic procedures that have remained unchanged for decades, such as the processing of shop drawings. But architects and engineers are beginning to understand that process innovation can lead to significant improvement in how buildings are designed and constructed. The door to such innovation is being opened by new technology such as building information modeling (BIM), and designers are being pushed through by growing pressure from clients to work smarter and faster.

Conventional design is both sequential and iterative. But today's "Next Architects are thinking well beyond convention. Fast-track schedules have become the norm. Jobs that used to take years to design and document now take only months. This forces architects to use new tools and techniques.

The issue of liability also looms large. Clients expect technical documents to be nearly perfect, and they quickly pounce if errors or omissions increase costs or delay schedules. BIM technology helps because it cross-references information on the plans, sections and elevations simultaneously. BIM also helps track material counts and costs. Fewer errors and better document coordination translate into fewer change orders in the field.

Sustainable design also is taking root. People now understand that dealing with global warming and climate change, making wise use of natural resources, factoring in lifecycle cost and developing new sources of clean energy are vital to ensuring a healthy future for all. This is changing the nature of design and construction in profound ways—from materials to management.

Architects and engineers must also devise new and more efficient ways of doing business because their professional fees are not keeping pace with rising construction costs. In fact, they are getting tighter, even while entry-level salaries for new graduates are increasing.

With all of these changes in the wind, what is an architect to do? The response is a new kind of design process, dubbed "HyperTrack. This basically discards the sequential way of thinking in favor of simultaneous decision-making that involves the owner, architect, consultants and contractor working as equal partners from the very beginning of the design process. Using BIM, each team member can contribute to a common data base that becomes the basis for the built project. Shared authorship also mitigates risk, as each member of the design team is mutually responsible as well as liable for the results.

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Using “decision-ready information”, the team can simultaneously assess design ideas for their functional and aesthetic attributes, as well as impact on schedule and budget. By doing so, cost and schedule control is so deeply embedded in the design process that there is no need for value engineering.

This new team-based approach to design takes full advantage of all the experience and expertise around the table. Contractors, engineers and clients can offer meaningful input from the very outset, and more brainpower makes for better buildings.

Making decisions more quickly and better produces big savings (see chart below). A study of five projects shows an average savings of nearly \$5.4 million per project and schedule acceleration of 8.4 months.

Recent Project Results Using HyperTrack

	Project A	Project B	Project C	Project D	Project E
Size (sq ft)	363,000	250,000	500,000	160,000	205,000
Budget (\$ mil.)	109.0	83.0	130.0	26.1	49.0
Actual Cost (\$ mil.)	103.0	77.3	102.0	25.4	44.5
Savings (\$ mil.)	6.0	5.7	10.0	0.7	4.5
Savings (%)	5.5	9.3	9.2	2.7	10.1
Typical schedule (mos.)	26.0	18.0	30.0	24.0	30.0
Actual schedule (mos.)	18.0	6.0	16.0	18.0	28.0
Time Savings (mos.)	8.0	12.0	14.0	6.0	2.0

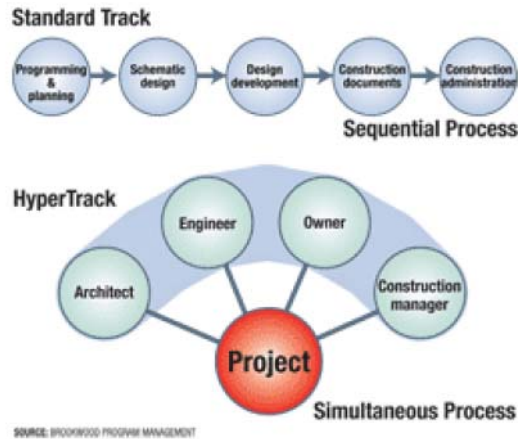
Source: SmithKline Group

Naturally, this new process places a big premium on leadership and collaborative skills, and that’s where the “Next Architect” can really shine.

The recently completed Novartis Institutes for Biomedical research in Cambridge, Mass., was created by renovating an old candy factory. The entire 500,000-sq-ft building was under budget and in record time—only 16 months for design, documentation, construction and commissioning. This could not have happened using conventional design-bid-build.

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In the new world, projects will be produced using BIM, thoroughly integrating the design professions with the construction process. Bidding will be eliminated in favor of selecting prequalified contractors and suppliers and inviting them to work with the design team as active partners.

Shop drawings no longer will be necessary because the suppliers will help develop the detailed technical documents as the construction drawings are being produced. Requests for information will be greatly reduced, if not disappear. Liability also will be mitigated, since all parties will be co-authors of the

BIM model and equally responsible to each other for quality results. Schedules will be accelerated and prices will drop because there will be no bidding premiums. Best of all, both quality and profits should increase.

If adopted widely in the U.S., integrated delivery could easily produce savings of 5% to 10% per project, or between \$50 and \$100 billion annually. Compare this with total fees annual of \$25 billion paid to all architects nationwide. Clearly, there is a big upside when design professionals link up with construction experts and begin to re-design design.

KlingStubbins provides professional services in all major disciplines within the realm of architecture, engineering, interiors, planning, and landscape architecture. The firm consists of more than 550 professionals in its Cambridge, MA; Las Vegas, NV; Philadelphia, PA; Raleigh, NC; San Francisco, CA; and Washington, DC offices. Its areas of market focus and specialization include Corporate/Commercial, Government, Health Care, Higher Education, Hospitality/Entertainment, Institutional/Civic, Mission Critical, and Research and Development.

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