



a race with technology

How do architects keep up?

BY COURTNEY PATTERSON

When Lynn Halling graduates from Carnegie Mellon University's School of Architecture in a couple years, she will have used approximately three different versions of Adobe® Photoshop® and five versions of AutoCAD®, and that's only in five years of college, before she enters a firm where she may be required to learn a new set of software.



Over the course of her 30-year career, she will be confronted with more technological changes than any of us can imagine. Consider how architecture has evolved in the last thirty years – computers have replaced the drafting board, and Building Information Modeling (BIM) is fundamentally transforming the role of architects from solo draftsman to key collaborators in the entire design and construction process.

The problem is not unique to the architecture community. Technology is always changing and forcing us to change with it. In any organization, there are people who resist change because it's uncomfortable, because learning a new method is inconvenient, and it disrupts

INSET AND LEFT: Interactive whiteboard technology is demonstrated at Case Technologies, allowing whole teams to interact with BIM models. Photos by Anna Lee-Fields.

their routine. The question of a generation gap often creeps into discussions about the ease of adapting to new technologies: does age dictate the learning curve? While Generation X and Y have grown up with computers and cell phones, their comfort with technology does not assume a mastery of more complex software like Revit. In fact, you'll find that many of the people driving BIM adoption in local firms have been members of senior management teams.

Still, innovative software and processes like BIM or Integrated Project Delivery (IPD) have widened the knowledge gaps in many firms. To produce three-dimensional models in Revit, an architect must have a sophisticated understanding of how a building is assembled – an understanding that often comes with years of field experience and collaborating on project teams. However, drafting and modeling tasks have traditionally been assigned to the junior staff to help them learn the ropes. It is always the case that staff members, regardless of age, contribute different skills and knowledge based

on their experience and education; but as the industry transitions to BIM, it's increasingly important to consider how firms can integrate their talent. How do you take advantage of what both the senior level practitioner and the tech savvy intern have to offer?

“The most successful implementations we've seen are ones where the generations come together,” says Mark Dietrick, AIA, LEED AP and Director of Services at Case Technologies, who consults with architects, engineers, contractors, and owners to help them understand how technology fits into their practice. “There has to be a much higher level of communication and coordination between the senior level practitioners and the junior level people who are actually using the technology. BIM provides an ideal platform to enhance the mentoring process.”

As technology continues to shape the profession, it offers opportunities to improve the ways we share knowledge within firms and enables learning at all stages of one's career.

WTW Architects President and CEO Rich DeYoung, AIA reviews project documents with younger architects





Digital Fabrication Lab at CMU

LEARNING FROM THE MASTER

Before architectural drawings are sent out the door at WTW Architects, President and CEO Rich DeYoung, AIA, sits in the conference room to review them with the younger architects who worked on the project. It's his way of sharing what his thirty-plus years of practicing architecture have taught him about how a building goes together. Having driven the adoption of technology at the firm since the early 1980s, he also knows the nuts and bolts of the design software the interns use.

"It's important that some of the seasoned professionals are conversant enough in the software that they can get beyond the screen that separates the younger, inexperienced architect and the experienced architect and help them learn with the tool that's available," says DeYoung. When DeYoung encounters pushback from an intern about the capabilities of the software, he can offer an alternative: "Let's try this feature of the software. Let's look at it another way."

DeYoung's dialogue with interns is reminiscent of the apprenticeship model on which the architecture profession was built, where the younger person is taught at the hand of the master, working alongside, observing, and asking questions. Nick Liadis, intern architect at Desmone and Associates, believes that mentoring is intrinsically tied to the profession, given its collaborative nature. When it comes to interpreting code, coordinating with engineers and contractors, and designing technical details, he must

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rely on his senior colleagues when his limited experience does not afford the answers. "With the ever-increasing amount of diverse information architects are exposed to in academia, often times, specific real world knowledge can't be taught," he says. "It's through mentoring that I gain that knowledge."

In a formal way, NCARB's Intern Development Program facilitates the mentoring process. Licensed architects serve as mentors for architectural interns, making sure they're exposed to the breadth of experiences that enable them to hone the skills required to practice as independent architects.

Yet, at many firms today, where principals wear multiple hats and must worry about all the facets of running a business, one-on-one training may seem impractical. Michael Warren, AIA, claims that those mentoring opportunities are invaluable and especially pertinent as more and more firms use BIM software. "If interns could get in the field to see the projects they have worked on and have someone explain why they dimensioned a section this way, made that line thicker or added notes here, they would have a better understanding of the relationship between the rendering and the physical building," he says.

TEACHING THE TOOLS OF THE TRADE

Considering the vast amount of knowledge that comes with simply doing a job, universities must constantly reevaluate whether they are effectively preparing students for careers in archi-



ecture when instruction is weighted so heavily in theory. Because the number of digital design tools has skyrocketed and the software learning curve has grown significantly, institutions now have a greater responsibility to ensure that students have at least a basic understanding of the tools before they enter practice.

The role of the university, suggests Jeremy Ficca, AIA, Associate Professor and Director of the Digital Fabrication Lab in Carnegie Mellon University's School of Architecture, is not simply to train technicians, but to provide students with a framework so that they understand why and when they would use digital design tools. "The expectation is that students come to understand the implications and opportunities inherent with BIM tools in the context of contemporary practice, why they're relevant, why they're significant, and why they're not just another representational CAD or modeling application." When Ficca joined Carnegie Mellon University's faculty in 2007, he set up the Digital Fabrication Lab [dFAB] to provide students with hands-on opportunities to translate their digital design work into physical output. This sets up a feedback loop in which physical production and materiality inform the design process and in return affect one's material sensibility. Here, the student's immersive experience prepares them to communicate with the people who will be constructing their designs.

Besides giving students the chance to learn firsthand the strengths and limitations of design tools, the lab also helps them cultivate a capac-

ity for self-discovery, a life skill that will come to their aid continually as they move out of the classroom and into a firm. Some firms, especially smaller ones with limited resources, leave the onus on staff to teach themselves new technology. Even at software-saturated CMU, Lynn Halling claims that she has learned a majority of software through her peers. Having unlimited access to an extensive collection of modeling and drawing software is allowing her and her fellow students to discover "the method that works best for us as designers, using the software as a tool for representation rather than as a design strategy."

KEEPING PACE WITH TECHNOLOGY

Keeping abreast of technological changes throughout one's career can be daunting, but professionals need to commit themselves to continued learning if they hope to get the most value from their software. When helping companies implement BIM into their practice, Case Technologies designs a curriculum customized to each client, using one of the client's projects as the training material. Because BIM is so expansive, learners can easily become overwhelmed if too much information is dealt at once. To make the learning digestible, trainers deliver the modules, which are geared toward specific processes, in smaller doses, allowing clients to absorb and apply the information before they take on the next modules.

The key to a successful BIM implementation, explains Dietrick, is to engage a wide range of

project participants in the process – not simply the people doing the production work but the project managers and principals, as well. Project managers need to know enough about the software to be able to monitor the model, manage schedules, and oversee the electronic review process. Principals need to understand the significant impact the technology may have on the organization and project delivery process.

Perfido Weiskopf Wagstaff+ Goettel took this approach in bringing their staff up to speed with Revit. The firm was driven by a desire to change when their clients began requesting BIM. Principal Kevin Wagstaff, AIA says the firm encouraged as many people as possible to develop an ability to work with the software, so that it was not seen as a mystery that only certain designers could decipher. Rather than invite outside trainers into their office, the firm has relied on knowledgeable employees to teach others in the office and has given staff the time to teach themselves with tutorials.

Dietrick says, “A problem we see is when BIM starts more as a grassroots effort from the younger generation. If that happens, you’re only going to implement BIM to a certain level. There’s going to be a disconnect between the project architects who are using the technology and the project managers and the principals who are understanding how projects really happen and how the technology can change the way these projects are delivered. There needs to be a champion in the organization from the management level.”

At WTW Architects, Rich DeYoung was that champion. Four years ago, he decided that the firm would transition to using Revit exclusively on all projects over the course of one year. Initially, he sent groups of six to eight employees to a 1-week training session at a local vendor. Those employees became the first to complete Revit projects in the company. Throughout the project, they received support from outside trainers, who helped them resolve problems. As the first Revit projects came to a close, DeYoung divided the teams and seeded the new projects

with a mix of experienced and inexperienced staff. An in-house trainer taught the less experienced personnel how to use the software and continues to conduct regular training sessions and lunchtime seminars to keep employees sharp. During the first year, DeYoung encountered repeated pushback from project managers who resisted the shift to BIM, but each time “I would patiently listen and explain why we’re going to do it anyway.”

Because not every firm has the resources to retool and train a whole staff, AIA Pittsburgh expects to be a knowledge source for new trends and training solutions. The chapter is trying to identify the greatest education needs of the local architecture community, and intends to help architects adapt to new collaborative processes with an increased number of workshops in the future. For this year’s Build Pittsburgh, Anne Swager, Hon. AIA, Executive Director, says that she has received at least five proposals for BIM or collaborative practice classes.

Carnegie Mellon University is also trying to respond to the demand for technology training with continuing education courses targeting a wide range of practitioners from interns to experienced architects. The classes, which could be offered as early as this summer, would aim to demonstrate how architects can leverage the software to deliver better design and make them more effective practitioners. Modeled around best practices, the classes will be taught by individuals who have made successful changes in their practice. Ficca sees the courses as an opportunity for greater knowledge sharing between academics and practitioners.

When BIM is implemented successfully into a practice, it has the potential to bring everybody together in a more collaborative and integrated process – architects and contractors, interns and project managers, the expert and the novice, the university and the firm. Each stakeholder has something to gain in the race to keep up with technology, and it all begins with the commitment to learn. 