The Cost of Not Doing BIM: Education and Professional Development

By Robert Yori

BUILDING INFORMATION MODELING (BIM) is rapidly becoming the de facto standard for how buildings are designed, constructed and maintained. BIM has planted itself firmly into the universe of knowledge that architecture, engineering and construction (AEC) professionals must inhabit, including parametric design models and space programming tools; from quantity takeoffs and cost estimates; modular prefabrication to assist tracking and project phasing; and BIM execution plans, to facility management (FM) models and Construction Operations Building information exchange (COBie) standards.

Familiarity with the topic is more of a necessity than a preference. Entities such as the U.S. General Services Administration (GSA), the U.S. Army Corps of Engineers (USACE), states, educational institutions and healthcare companies have recognized the efficiency, the increase in quality and the owner benefit that BIM brings to a project. They have even begun requiring its use. In the simplest terms, the "cost of not doing BIM" translates into not being considered for projects due to reduced project quality and increased schedule times. In more individual or personal terms, it manifests itself as an opportunity cost of slowed personal advancement and decreased satisfaction.

This article proposes BIM as an integral part of professional development, which, when coupled with other types of professional expertise, advances one's profession or trade through innovation, enhances the quality of the built environment and enriches one's own professional experience. In this context, the "cost of not doing BIM" can be viewed as "not advancing professionally."

BIM AND PROFESSIONAL DEVELOPMENT

Professional development is defined by dictionary.com as, "the advancement of skills or expertise to succeed in a particular profession, especially through continued education." Such education can take place in the form of mentorship, study and research, or personal experience. Professional development is inextricably tied to knowledge, accomplishment and success, whether it is in the eyes of oneself or in the eyes of others.

The term "skills or expertise" is broad in scope and can be attributed to knowledge about particular systems, techniques or managerial aspects of a profession. For example, an architect might demonstrate particular knowledge about curtain wall and building enclosure systems, a structural engineer might be known for expertise on super tall building structures and a fabricator might have developed expertise in minimizing the waste of raw materials when forming ductwork. All are professional skills, each directly germane to a particular profession or trade and each can be informed in some way by BIM.

BIM describes the embodiment of professional knowledge and technique into a process. To quote Finith Jernigan; it is about, "managing to get the right information to the right place at the right time." Such a feat combines specific technical knowledge, the ability to convey that knowledge using specific tools and a managerial understanding of what to deliver, to whom it should be delivered and at what point in the project it should be delivered. BIM is truly a skill and mastery of that skill certainly qualifies as expertise.

BIM SKILLS AND EXPERTISE

By definition, BIM is about information, communication and delivery. Understanding BIM requires an understanding of the processes and intricacies of design and construction. Conversely, an understanding of those processes can be fortified by understanding BIM. For example, familiarity with the problems of conflicting structural and heating, ventilating and air conditioning (HVAC) systems is helpful in understanding the importance of preemptive clash detection as part of the design and preconstruction BIM tasks. An understanding of building construction means and methods would be helpful to an individual who needs to phase the construction logistics of a project. Experience with project cost estimating will help inform the type and level of specificity required in pricing a BIM.

SUPPORTING SOFTWARE

Learning Navisworks, Revit, Vico, Tekla or any of the other BIM tools is as important to the BIM process as understanding the process itself, as long as the tools are learned with the overall goals in mind. Knowing the tools affords one the ability to contribute in the common communication platform, in the same way our knowledge of how to speak allows us to contribute to a conversation.

Unfortunately, the most commonly recognized approach to BIM training might be lacking the proper context. Students often enroll in classes designed and optimized to teach features of a given piece of software. There are also self-paced versions, video tutorials and books, some of which are more comprehensive than others.

By their very nature, most of these types of classes focus on application functionality without providing the "big picture" perspective of the overall BIM process. Unfortunately, examples and exercises used in these types of classes may not parallel the use cases that the students face in their professions—the poorer the match, the less material retained by the student. In the absence of applied knowledge (for example, learning the tool in the context of specific professional goals), this type of learning is, at best, mildly successful. It is imperative that such classes be supplemented with material more specific to

an individual's particular professional area of interest for an optimal learning experience.

HOW ADULTS LEARN

Applied learning is the key to any type of adult learning, whether it is software, BIM, a language or anything else. Adult learning motivation is at its highest when an individual can relate the material to his or her experiences. What could be more motivating than a direct correlation to one's day-to-day responsibilities? What if a relationship could be established to BIM and increased efficiency? Increased project quality? How about innovation?

TYING IT ALL TOGETHER

Once a cognitive understanding of the BIM process and a cognitive understanding of the supporting tools are achieved, coupled with an in-depth understanding of other profession or trade-specific knowledge, the real innovation begins. Tools can be used to rapidly test and answer questions that might not have been asked without using them. For example, a structural engineer might run a load path optimization simulation and the result may lead to a different way of thinking about the original problem and perhaps an entirely new solution. Clash detection might lead a fabricator to redesign the duct depths. The results of a heat gain analysis might prompt an architect to rethink an all-glass west façade. While technically possible without BIM, such tools accelerate and ease the processes of coordination and redesign.

It is absolutely essential to the development of design professionals or tradespersons that they continue to learn and acquire professional knowledge, and expertise, judgment and discretion to successfully understand the BIM process and tools in the proper context. Examples of this necessity are reflected in structural analysis and environmental design software, which can be useless and often detrimental, if the individuals using them do not understand the principles on which they are based and cannot properly interpret the results.

CONCLUSION

So, what is the cost of not doing BIM? It can be thought of as a series of opportunity costs, including the potential loss of work and incurred fees. Quite directly, there is a cost associated with not even being considered for large-scale work. On a more personal level, learning, using and mastering BIM affords an individuals a more thorough understanding of modern design and construction tools, techniques and processes. Such knowledge helps keep them current, invested and interested in their profession, deepens professional knowledge, helps to raise the quality of the built environment and contributes to a greater sense of personal satisfaction. What's not to like? ■

Robert Yori is a Digital Design Specialist at Skidmore, Owings & Merrill LLP, one of the leading architecture, interior design, engineering and urban-planning firms in the world.