

Unified Workflow: Better BIM = Better Designs

In the ever-evolving world of building information modeling, putting process before technology solves fundamental issues. Read on as the authors touch on Agile, common roles, and BIM's fate over the course of a project.

By Joshua Getz and Julio Saenz

In today's technological environment, the rate of change is increasing at rapid speed. Software release cycles are compressing, and the advent of cloud-based services and applications is redefining functionality and driving new releases every 30-60 days. Add to this the increased amount of software platforms coming to market, especially in the cloud sector, and it all adds up to an overwhelming amount of technology to understand, test, and ultimately select.

This can be a daunting task for any enterprise. How do we make the best decision about where to focus our time, energy, and money? How do we keep the "shiny objects" from becoming distractions? The first step to approach this challenge is not in the direction of technology, but rather toward a critical understanding of one's processes.

THE PROPER ROLE OF TECHNOLOGY IN A BIM-ENABLED ENVIRONMENT

As part of the AEC industry, we have heard many times that building information modeling (BIM) is a process and not a technology, and this is a generally accepted statement. However, it can be somewhat difficult to find examples of this idea in practice, where BIM is guiding company and/or project team behavior. Why is this the case despite an ever-increasing number of companies reporting that they are BIM-enabled? The answer involves several critical, simple, and yet unanswered questions that need to be asked at both the company and project levels. If BIM is a process, then what is the role of technology in BIM-enabled jobs and companies? Rather

than simply claiming that BIM is a process, we should ask, "What is the BIM process and how does it get defined?"

At both the project and enterprise level, technology should exist as an accelerator of well-defined processes. To accomplish this, the current process and the ideal state must be defined in order to understand the different technologies that can assist in achieving optimal outcomes. The ability to measure improvements and truly understand how technology is impacting the business is incumbent upon well-defined processes; this can also deter an organization's

Unified Workflow Case Example

When Southland Industries, a national MEP building systems firm, began considering its ideal workflow, the company started by looking at the departments and functional areas downstream of its design groups: fabrication, construction, commissioning, and service and maintenance. As a result, they gathered information that would eventually be required at later stages in a project.

This analysis of departmental workflows and data at various stages of the project lifecycle informed the main component of their ideal workflow: to unify the construction knowledge available through their design capabilities in order to build more constructible designs.

The goal was to get closer to modeling objects correctly the first time and to ensure decent data is created and maintained throughout the lifecycle of the project. This required a focus on the people (roles), processes (workflows), and technologies (accelerators) used to deliver projects.

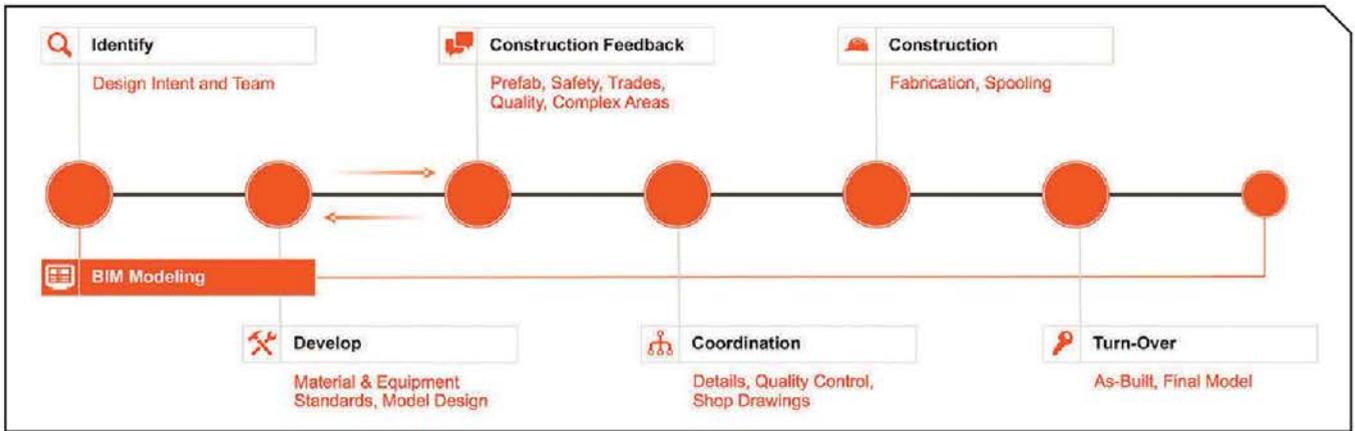


FIGURE 1. Concept of VAV Fume Hood.

habit of “chasing every car that passes by,” which steals critical time and energy from organizational teams. It is vital to start with the end in mind and give serious thought to the ideal state that the team desires to work.

DEFINING THE IDEAL BIM PROCESS

The definition of an ideal BIM process has two parts: one for the company’s internal BIM processes and another for its engagement at the project level with other team members. As stated previously, it is important to start with the end in mind in order to develop a holistic solution that encompasses all aspects of the company’s workflows and internal departments. Once the requirements and information are defined, appropriate workflows can be built or augmented. This allows proper technologies to be selected and implemented to support these processes.

Southland Industries, a national MEP building systems firm, defines this as the integration of people (roles), process (workflows), and technologies (accelerators) used to deliver projects. A unified workflow typically begins with the assignment of proper roles to a project. The primary roles include the project manager, engineering lead, project BIM lead, and project constructability lead. This team is assigned to a project from the beginning and is responsible for ensuring that the BIM processes are followed, leading to the desired deliverables for the project.

The project manager has overall project responsibility; the engineering lead is responsible for the overall design; the project BIM lead arranges the required BIM processes and technologies; and the project constructability lead must ensure that models are built with the correct information and that the design is constructible from day one. It should be noted that this particular role of constructability is often confused in relation to technology to mean that each of the perfectly geometrically

accurate parts are present from the beginning of modeling. This is not necessarily the case. Model content is a key focus today, especially in the mechanical disciplines, but not all constructability issues are a result of inaccurate content. This is particularly true in early design when certain areas do not yet need that level of detail.

That said, it is entirely possible to incorporate constructible concepts into the design model. This can be done in such a way that much less manipulation of the models will occur later in the process

through coordination and pre-fabrication processes. In-constructible models can still be built with the right content, so these terms should not be used interchangeably. The project constructability lead can focus on the materials and methods, but also on routing methods and pre-fabrication opportunities that may lead to higher efficiencies and safety in the fabrication and construction phases. If these ideas are captured early enough, they do not need to be modeled more than once or drastically changed later in the process.



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Making Industry Connections

Ironically, the software industry is one we can turn to as a good example of process restructuring to meet a desired end state. Traditionally, software was developed with what is known as the waterfall method, which involved developers gathering requirements early in the project. Then, they would work separately for a period of time, writing code before they returned to present the end result. Between gathering the initial requirements and delivering the final product, the client had little involvement into what was being developed, or lacked many opportunities for course correction. This caused massive amounts of rework in the industry and ultimately spawned the development of the Agile software development method.

With Agile, the requirements are still gathered at the beginning of a project, but the work is organized into short intervals called sprints that typically last two to three weeks. At the end of each sprint, the client is presented the work output in order to address any concerns and make adjustments. With this approach, the end result is never unexpected, design alterations can be made, and issues are caught earlier in the process, which is both more cost effective and efficient. This process represents a shift toward an intense focus on managing to the overall project result and not just the initial requirements and expectations of the client. In this way, a successful result is more a byproduct of its process instead of time-sensitive adjustments in order to meet deliverable requirements.

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The increased effort during the design phase of a project will lead to generating and sharing better information. The buzz words “Big Data” or “The I in BIM” have been circulating in our industry for some time now, but we should consider the quality of the data more so than the quantity. As the industry focuses on improving project team collaboration and adopting lean practices, which are both applicable, project information will become better over time. Increased quality of collaboration and richer information will enable companies to improve their product, gauge the effectiveness of their teams, remain competitive, and improve the quality of service provided to clients.

INCORPORATING EXTERNAL PARTNERS

As internal workflows are defined and documented, it is equally important to define how to work with the external project team, and a BIM execution plan is commonly utilized for this purpose. It seeks to identify and document the BIM requirements on a project as early as possible so that the right people, process, and technology can be put into place and produce the desired results. This plan sets common team goals and objectives, while outlining responsibilities and realistic expectations.

The BIM execution planning process



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should ideally be started at the outset of a project in order to define as much of the project requirements as possible before the majority of work begins. Unfortunately, the BIM execution plan typically receives less and less attention as a project progresses; it's developed in the beginning stages, only to fall by the wayside throughout design submission and coordination phases of a job. The result can be hazardous when it comes time to create and submit final deliverables that meet the owner's expectations as defined in the RFP or other contractual documents. For this reason, it is beneficial to continue the BIM execution planning process as the project progresses. Team members who lack the experience will benefit from learning the processes and will also gain an understanding of the importance and pitfalls associated with a certain level of planning, or lack thereof.

As a project team, a more intense focus could be placed on the processes defined in BIM execution plans, both in identifying requirements and the rigor used in execution. It is important to recognize that each individual optimization may come at the expense of another. As a result, BIM processes must be viewed from the standpoint of macro optimization at the project level, not the micro optimization of which the team is typically engaged.

A change in process within the industry is taking hold, particularly with the rise of different delivery methods such as design-build and integrated project delivery. Even so, we must stay focused on process first and technology second. When researching and implementing new technology, it is critical to understand the value that it brings in supporting or accelerating the

process. While research, development, and implementation of new, innovative technologies should be a focus, it will prove much more productive going down that road when you have a map and, even more importantly, a good reason to choose a particular path. **ES**

Josh Getz currently serves as the Corporate Building Information Modeling (BIM) Director for Southland Industries. In this position Josh works on Southland's overall BIM strategy, focusing on research, development, and implementation of new BIM technologies. He also oversees the support and training of these technologies across the enterprise. His experience involves various roles within Southland's Mid-Atlantic division's CAD group and corporate BIM team. Josh received his Bachelors of Science in computer-aided product design. He can be reached at JGetz@southlandind.com.



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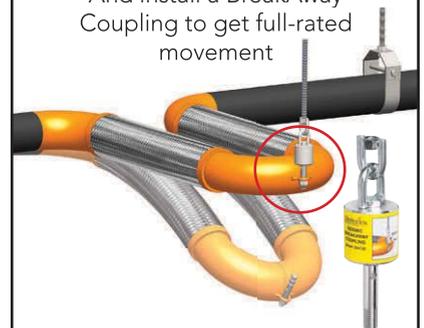


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