Taking BIM to the Next Level: Operations

Applying building information models to lifecycle management

By Megan Headley

As the benefits of applying building information modeling to the design and construction of complex medical buildings become increasingly well known, model stakeholders are recognizing that those benefits can be drawn into improving facility operations. It's increasingly common for contractors to turn models over to healthcare owners at handoff. In fact, a 2015 Dodge Data & Analytics Smart Market Report on the impact of BIM on complex buildings found that 52 percent of contractors surveyed typically provide building owners with models at the close of construction.

But when owners turn those models over to facilities managers with the guidance to "use BIM," FMs are often left wondering how to apply the overwhelming data with which they're presented. It's one reason that the Dodge report found that of the 86 percent of owners who receive models, only 17 percent report using data from the models for facility management. The rest, perhaps, are looking for a place to start.

It's a problem to which Meghan Ruffo, contract BIM manager for Carolinas Health Systems in Charlotte, N.C., can relate. Six years ago, when Carolinas began using BIM on a new construction project, the significant cost and time savings the technology made possible were eye-opening.

"The leadership here thought we might leverage this for more than our new projects," recalls Ruffo.

The question was: How?

Finding a starting point

One challenge many healthcare FMs face is that BIM knowledge is not widely shared. Each organization is faced with creating individual cost- and time-effective BIM processes. And many healthcare organizations respond to the challenge to apply BIM by trying to harness all of the potential benefits. The result is often what Chuck Mies, senior manager, AEC business development, for Autodesk Inc., calls "analysis paralysis."

"I've got one healthcare organization that has been having the same conversation about BIM for two years," Mies shares. "They've had two new buildings come online in those two years and they've missed the opportunity to get any benefit because they're still trying to figure out the big picture."

It's this reason that Mies, with colleagues from Carolinas Health System, Mayo Clinic and The Ohio State University among others, formed the BIM for Healthcare Owners Group. The collaborative community was launched as a place where owners can share BIM best practices, discuss processes and technology and explore successes and failures.

Among other insight, the group has found that FMs find the greatest success in applying BIM when they begin with one area with clear benefits.

For Carolinas, the biggest benefit to adopting BIM was in the reduction in errors and omissions in designs, Ruffo explains. “That was the first path,” she says. “Now we use it as a standards check on projects. We can ensure that we have the right finishes, and can run some basic code to find that doors or dampers in fire-rated walls have been marked.”

By preventing common change order issues, the team was able to validate the initial investment, and expand on the savings with new applications. In 2012, the organization mandated that all projects going forward would be in BIM, and the data would feed the work order management system and inform space management decisions.

“Now we’re looking at how we can use these for analysis to help us make even better decisions, such as around Lean workflow or energy analysis,” Ruffo says.

Getting insight from end-users

To determine where the biggest benefits can be found, Mies offers a piece of crucial advice: start with the people who will work with the data. If the goal is to improve preventive maintenance, for example, then meet with maintenance technicians to discuss what information they would use.

This was the path followed by Mayo Clinic. Once the organization set its goal — to use BIM to find cost savings in operations—John Muhler, the architect handling campus planning and design, turned to the experts.

“We’re now asking our Operations Department ‘what assets are important to you?’” Muhler shares. “One of the example discussed was air handling units. We suggested using the model to create zoning maps for the units.”

Depending on additional goals, meetings may also include specific subsets of maintenance technicians. Space planners or lease administrators, sustainability managers and even HR/accounting may also have insight into data needs.

Agreeing on data

For organizations looking to start with the basics of improved preventive maintenance, there are, perhaps unsurprisingly, a few common attributes that every FM seems to want.

A recent paper published by the BIM in FM Consortium, a group of BIM facility management users working in partnership with FM:Systems and Georgia Institute of Technology to understand issues around BIM, found that most FMs find six attributes to be of utmost importance.

The paper, BIM for Facility Management: Version 2, shares that most survey respondents’ were predisposed to gather as many data points as possible — a path leading to analysis paralysis.

However, the most necessary data sets were asset ID, manufacturer, model and serial numbers, asset type and installation date.

Kathy Roper, co-author on the paper and director of the Health Care Institute, explains that the move to BIM requires a shift to a less is more mindset. It's a tough change for experienced facilities professionals like her.

"Whereas we wanted to collect everything possible in CAD drawings for reference, the interactive nature of BIM requires that, to maintain data integrity, we must identify the critical data that will be utilized on a daily or weekly basis and limit the manageable data to only six to 10 attributes," she says. "The limited information that is needed can reliably be maintained each time changes are implemented to that item."

Maintaining good data for the full lifecycle

Another challenge in applying BIM to operations is integrating it into existing processes. For example, The Ohio State University is working to integrate BIM asset data into its CMMS to gain the full benefits of its warranties.

Warranty information isn't always easily available, accurately entered in the CMMS or entered before the warranty period has expired, explains Joe Porostosky, director, facilities information and technology services, The Ohio State University. As a result, when building components break, the facilities department fixes it. By attaching warranty data to an asset in BIM, and transferring that information into the CMMS on day one of operation, the team expects to reap significant cost savings.

"We only need a few fields," Porostosky says. "If we can get those as a data elements instead of locked in a PDF, we can attach that data directly to the asset in our CMMS so everyone looking at that asset in the system can immediately find warranty information."

The first step is to build import tools for the CMMS to enter the BIM data into the system. While this process can be time-consuming initially, the time and cost-savings over the long-run can be significant.

Expanding the conversation

While healthcare organizations may find unique ways to apply BIM to lifecycle management, most organizations follow a similar path. That's why groups such as the Healthcare Institute, BIM for Healthcare Owners and the BIM in FM Consortium are working to create conversation around BIM among FMs. But the conversation also must include the design and construction professionals bringing models to the table. To maximize the value of a building's full lifecycle, it's crucial that FMs be involved early in the planning, design and construction conversation.

As Roper points out, "Most architects, designers, engineers and constructors do not know exactly how operations will be impacted by their input, so participation of the FM in the early design phase is critical to realize the best outcomes."

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Editor's Note: The Health Care Institute, in partnership with BIM for Healthcare Owners, has published a series of white papers addressing the use of BIM for operations and maintenance. The series is available for free download at http://hcinstitute.info/research_reports.html.