Best Business Practices and ROI for Facility and Asset Management

By Igor Starkov

BUILDING INFORMATION MODELING (BIM) for facility management (FM), or "life-cycle BIM" as I prefer to call it, has been discussed within our industry extensively over the past year. Every major FM expo had a track about BIM and FM and there are several LinkedIn groups discussing issues relevant to life-cycle BIM. Most of the attention was given to the technical implementation, such as how to export Construction Operations Building information exchange (COBie) files from Autodesk Revit Architecture building design software. This is a simple task and advanced technology firms are solving these issues.

The bigger challenge of implementing BIM for life-cycle facility management is not related to technology but in convincing facility owners about the necessity of investing funds in making "BIM for FM" happen. We see a lot of interest in this topic but mostly from facility directors or chief engineers. However, they usually have difficulties proving financial benefits of the new processes and tools to their bosses and do not have much political power within their organizations to push for the significant investment that BIM for FM requires.

We're not just talking about a better handover and COBie; we're talking about a conversion of the whole capital assets inventory into a BIM-enabled environment **(FIGURE 1)**. This may take a decade for some large owners and millions of dollars of investment. Those millions of dollars can be paid off quickly, as we usually show our prospective clients using return on investment (ROI) calculations, but it requires strong leadership from the owner organization's management team, an educated workforce, the right set of tools, and, most important—the reengineering of business processes (the toughest part). So, why are most owners still reluctant to implement life-cycle BIM? In my opinion, this is mostly because the ROI calculations we demonstrate are based on assumptions and "soft data."

Proof of the benefits using "hard data" is difficult to show because even an advanced owner organization, like the University of Southern California (USC) (see the cover story of the Spring 2009 issue of the *Journal of Building Information Modeling*), which started piloting the life-cycle BIM approach more than three years ago, is still in the learning process and does not have enough "hard data" for benefits analysis.

Those of you who "did BIM" five or six years ago (medieval times for the BIM world), remember that owners were asking to show them proof that clash detection would deliver ROI on their construction project. Fortunately for the construction managers, convincing owners' representatives was easier; they were investing project money to gain benefits for the project. With life-cycle BIM, the challenge is that the investment is required during the project while the benefits and cost savings are delivered to the FM group. The capital projects and FM groups do not typically share the same budgets or executive leadership, and in some cases even compete with each other for funding.

Fortunately, some of the largest owners are demonstrating the ability to face the challenges of the unproven ROI. Some have started pilot projects researching how to implement better practices for delivering FM-focused BIM on new projects, renovations and even BIMing existing facilities.

I am involved in several projects of this sort, including deployment of a BIM-centric Central Facility Repository at USC; a project "Facility Information Model with Integrated BIM/CAFM/CMMS/BAS/GIS" for the Federal Aviation Administration (FAA); and the "Life-cycle BIM-based Energy Performance Assessment with Facilities Management" project for the GSA. These projects use different approaches to make life-cycle BIM happen.

THE UNIVERSITY OF SOUTHERN CALIFORNIA

As mentioned earlier, USC proceeded with the life-cycle BIM even though there was no "hard data" available. This is mostly because USC's Facilities Management department chose a visionary approach, supported by the university's administration. There is also a close relationship between the USC facility management group and the USC School of Architecture. Students here created BIMs for close to 50 buildings on the USC campus. **FIGURE 2** shows a model for one of the buildings on the USC campus: a variable air volume (VAV) box is highlighted in 3D, while its properties are displayed on the right, the real-time sensors data is shown on the left and the work orders for this VAV box are shown in the lower left corner.

Here is USC's vision: "We anticipate being able to travel through a virtual building model, with the ability to focus on its MEP+F systems, to visualize real-time conditions of an entire system. These models would be accessible in a simple, yet flexible interface, while being completely bi-directionally

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Figure 1. Converting all your capital asset inventory is possible. You can do it!

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data-integrated with all critical FM information systems. There will exist standards and processes (both industry wide and tailored for our facility), which will allow for seamless delivery of services and deliverables during the design and construction phases (the university adopted COBie in its latest BIM guidelines). This should be done for the goal of allowing our organization to completely monitor and operate a new (or recently remodeled) building, from the first day that it is turned over."

THE FEDERAL AVIATION ADMINISTRATION

Another example comes from the Federal Aviation Administration (FAA), which is going through a significant transformation over the next decade; a switch from ground-based radar control to a global positioning system (GPS). As part of the "NextGen" transformation, FAA is evaluating a transition to BIM while continuing to support traditional 2D workflows. The FAA team is working on an agency-wide life-cycle BIM implementation plan and would like to take advantage of the many benefits BIM offers.

To address this business challenge, Lockheed Martin awarded a contract to EcoDomus to develop a proof-of-concept project that includes laser scanning an existing facility, conversion of PDF drawings and point clouds to BIM, and integrating BIM datasets with FM packages, GIS and the building automation system.

Demonstrating these systems working together, providing better analysis of building performance and helping improve efficiency of FM personnel will help the FAA in its upcoming transition to the new ways of doing business.

THE GSA

This magazine has an article about GSA's objectives for BIM and facility management. My company is involved in several pilots for GSA and the most interesting is about comparing a BIM-based energy model (IFC to EnergyPlus) with actual data collected by the building management system to identify energy-related issues, while enabling engineers to utilize BIM for maintenance tasks, including access to BIM and all documents on Tablet PCs.

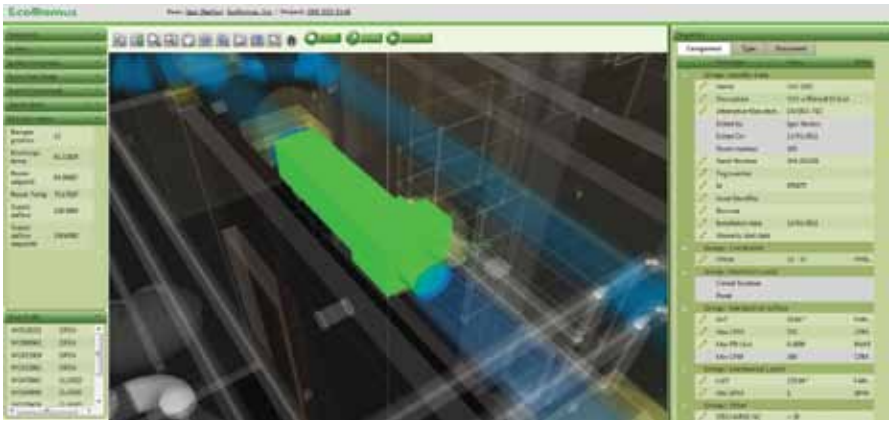

Figure 2. This image shows a model for one of the buildings on the USC campus.

CONCLUSION

I'll briefly state the obvious: government directives (for example, related to energy efficiency) or other regulatory requirements (for example, the Joint Commission on Accreditation of Healthcare Organizations for the healthcare industry) force organizations to adopt innovative techniques, including a transition to life-cycle BIM.

The examples we just reviewed have different approaches to proving the benefits or ROI for the life-cycle BIM: 1) a champion (a visionary) among the top facility management; 2) business necessity due to upcoming changes; and 3) regulatory requirements.

How you massage the "soft data" to prove your point is secondary. Picking one of those three (or coming up with more benefits), depends on a particular situation. But there is no doubt—life-cycle BIM is here to stay and sooner or later all building owners will adopt it. ■

Igor Starkov, Co-founder of EcoDomus, Inc., has 18 years of international business management experience, of which 10 years were dedicated to the construction software industry. EcoDomus solutions integrate BIM with FM software, with Building Automation Systems (BAS) and Geographic Information Systems (GIS) for the most complete analysis of building performance and maintenance.