


JBIM

Journal of Building Information Modeling

An official publication of the National Institute of Building Sciences
buildingSMART alliance™

National Institute of Building Sciences: An Authoritative Source of Innovative Solutions for the Built Environment

Spring 2009



The USC School of Cinematic Arts: The Arrival of Spring in the Facilities Industry

The USC School of Cinematic Arts: The Arrival of Spring in the Facilities Industry

By Dana K. Smith, FAIA

THE FACILITIES INDUSTRY HAS ENDURED a long hard winter, but a new day is dawning as evidenced by the School of Cinematic Arts (SCA) at the University of Southern California (USC). Designed by the Urban Design Group (UDG), SCA will likely be recognized for many reasons in the coming months and years, most notably as an example of how buildings should be created from this time forward. From the very beginning, the Lucasfilm Foundation, the company that was the primary donor requested that the planners, designers, construction contractors, and facility managers all use building information modeling (BIM) throughout the design and construction process and on through the building life cycle. Another notable request was that even though it is located in an earthquake zone, the facility is designed to be sustainable through a +100-year life span, which exceeds code requirements. While many projects today are designed using building modeling, this facility will use building INFORMATION modeling as it was truly intended. This life cycle view has led to innovative designs and preconstruction approaches, comprehensive engineering analyses, and unique operations and sustainment strategies.

This may well be the first full life cycle building project in the United States requested by a donor. While many owners are now specifying BIM as both a method and a deliverable, few donors or lenders have been as clear and definitive about exactly what they want. So how did this donor become

so smart? Essentially, experience proved to be a great teacher. The donor had previously completed the Letterman Digital Arts Center, a \$350 million project on which they saved an estimated \$10 million due to BIM. While the return on investment metrics have not yet been established for SCA, it is likely that millions will be saved over the life cycle of the facility. As structural engineer Gregory P. Luth, S.E., Ph.D., notes, “this project was ground-breaking on multiple levels. The university received a facility of exceptional architectural design of timeless elegance with a revolutionary structural system that assures a multi-generational life span built with superb quality on budget and on time, with an information model that will continue to have value throughout the life cycle. With the perspective of time, this project will be seen as a seminal event in AEC history.”

A critical need of the industry is a standard way to evaluate the quality and sustainability of a facility, to augment emerging anecdotal examples taken out of context. Unfortunately, collecting performance metrics has not been a strong suit of the building industry, though that is beginning to change. For the past two years, McGraw-Hill Construction and its industry sponsors have released statistically-rich SmartMarket Reports related to interoperability and BIM. McGraw-Hill has committed to producing these reports annually, with the planning for the next edition already well under way. One of the most interesting revelations of the 2008 SmartMarket Report was

that firms that measure return on investment report higher ROI than those that simply guess how much BIM is helping them. In one industry example, Holder Construction of Atlanta estimates that they have achieved a 5:1 ROI on their construction jobs using BIM. In another case, Dee Cramer, a sheet metal sub-contractor, estimates an 18 percent improvement using 3D vs. 2D on a single multi-phased hospital project. Many other industry leaders are reporting significant returns on projects, but there remains no standard way to assess or collect the information. To that end, the Alliance is coordinating the development of templates to collect statistical information from across the industry. Specific case studies of best practices are likely to emerge from this effort, but the primary benefit will be a statistical database of projects. When organizations may not want to share publicly project-specific results, they may be willing to include them in a database of aggregate results. Because of the varying levels of value of BIM at different phases of projects, this effort will look at all facets of the project in order to capture the holistic information that owners need to make the yes/no decision to require the use of BIM, just as USC and the Lucasfilm Foundation have done. The underlying capabilities that need to be in place to achieve the greatest return also need to be studied and catalogued. Some projects achieve greater ROI than others, so the question must be asked, “what are some people doing right and others not doing so well?”

However, change without a plan ultimately ends in chaos. If we fail to plan, we will have squandered the tremendous opportunity that is available to our industry.

A key element of success is leadership and awareness by facility owners in requiring BIM on all facilities. While “super buildings” attract the greatest press attention, significant ROI has been achieved on parking garages. High Concrete Structures, using Tekla Structures software, was able to complete the Charles Town Casino & Slots Parking Garage (another UDG-Greg Luth project), a precast structure, 15 percent under budget and three weeks early with zero design errors. The design of the structure, which would have required 60 hours using traditional methods, was completed in only 8.5 hours.

These examples illustrate how BIM is changing everything so quickly. However, change without a plan ultimately ends in chaos. If we fail to plan, we will have squandered the tremendous opportunity that is available to our industry. The buildingSMART alliance™ is working to coordinate an industry that has traditionally not been coordinated. Sadly, it appears not to be in our DNA to work together, yet as owners such as USC and the Lucasfilm Foundation become more numerous, the incentives will increase to ensure that we work together to achieve interoperability. The Alliance recently developed a strategic plan that can be accessed from the Alliance Web site. The plan, which is summarized below, is straightforward and easy to remember, with just four primary goals:

Build Team: The first step in collaboration is to understand who the players are and to identify their relationships. The Alliance web site includes extensive list of industry organizations that are key players in industry-wide team building. Each represents a particular constituency. Local interest groups of the Alliance also are springing up all over North America, each providing grassroots networking opportunities for pioneers, the fully engaged, or those who are just getting started. You can become a part of this team as a member, supporter, contributor, or sponsor.

Define Scope: Just how big is the elephant? We have traditionally focused on pieces of a solution without fully understanding the total picture. This has allowed us to get started and to work out the process, but it does not solve the entire puzzle. We need to map out all the activities of business processes and see how information should flow. Who is the authoritative source for the information and how do they get that information to others in the lifecycle so no one has to re-create it? This is



Photo courtesy of Veiv by Veiv.

a huge task for which little has been invested to date. The Alliance needs the help of some major sponsors to kick off this effort.

Accomplish Tasks: We have a good start on some of the tasks that begin to build the patchwork of the overall solution. Current projects are using the development process defined in the first release of the National Building Information Modeling Standard (NBIMS), but we need to begin stitching the projects together so we do not duplicate work and ensure that the individual projects connect. One of the most notable projects is the Construction Operations Building Information Exchange (COBIE), which demonstrates how information can flow from design through construction, gaining intelligence as the project matures with the intent of delivering it to the facility manager. Another notable project is agcXML, which was recently completed and is now available to automate the information flow now trapped in paper documents or disconnected applications. A future phase of the agcXML project could help populate COBIE. Another project, just wrapping up, is the

AECO-1 Test Bed, coordinated by the Open Geospatial Consortium (OGC). This project used time tested OGC processes to focus on energy analysis and quantity take off for estimating. These are just three of nearly twenty projects currently underway, all of which could generate potential industry standards.

Build Standard: The culmination of our efforts is the development of NBIMS. Version 1, Part 1 of NBIMS defined the process; Part 2 will define the consensus process based on the rules identified in the NIBS enabling legislation.

We are building a vision, a plan, and now are beginning to see case studies that define where we want to be. Our success and speed depends on you as a supporter, contributor, or sponsor. Most of the work is still performed by dedicated volunteers such as you; Version 1, Part 1 of NBIMS was completed with volunteer effort that has an estimated value of over \$1 million. Make a commitment today; our industry is depending on you. ■

Dana K. Smith is the Executive Director of the buildingSMART alliance™.