



# Creating BIM Value with Lean

By Kimberley Maul and Andrew Deschenes

The current Architecture Engineering and Construction (AEC) industry trend of incorporating Lean practices and construction techniques is a natural and welcome fit to enhance the building information modeling (BIM) experience for facility professionals.

Lean construction techniques and processes such as the Last Planner System and Target Value Design have received a lot of press in the past decade, but there are other processes that can help leverage your team's knowledge to solve problems before they happen. A good example of this is using Conditions of

Satisfaction, Work Flow Mapping, and Reflections to develop a BIM that continues to work long after the construction project is over.

Often, the incompatibility of technology and data systems makes easy accessibility to frontline facilities and maintenance staff cumbersome and difficult. Even owners who want to tap into the operations and maintenance benefits of BIM files and data have been reluctant to do so because the information is hard to understand and use.

However, recent advances in technology—specifically cloud computing and

mobile devices—have brought the long-awaited benefits of post-construction BIM into view. Yet to fully attain these benefits and advance as an industry, it's important to determine what solutions can help complete the circle. We must consider long-term operations and look at the best way to integrate workflows and technologies. This is where Lean steps in. It's great to use this new technology, but it's even more important for it to generate value.

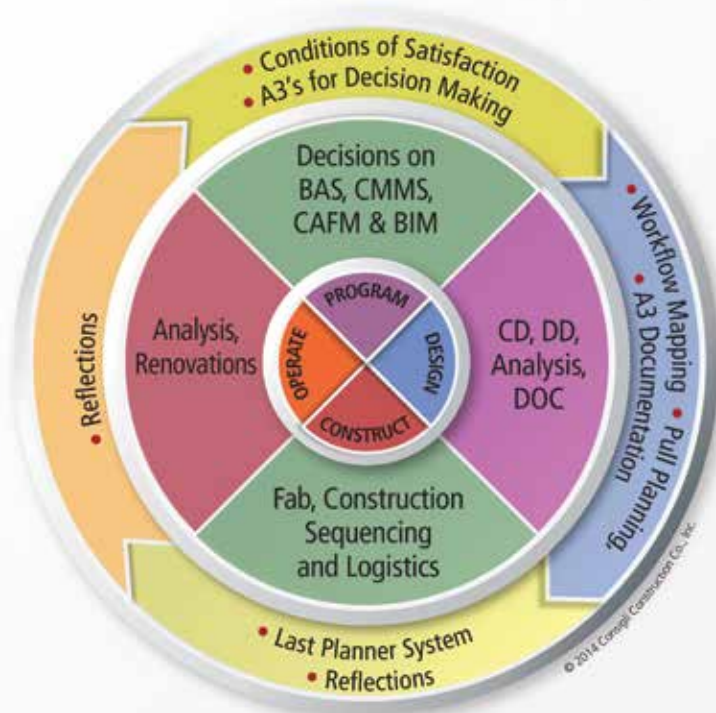
## DEVELOPING THE BEST SOLUTION

So how is it done? First the AEC team needs to understand how the facility is already managed, or is going to be managed after construction is complete, in order to develop the best FM solution for that facility.

From there, using a Lean process called Conditions of Satisfaction, guidelines are produced by the whole team to agree on and document what they consider will make the project a success. Coming together early and clearly understanding what is of value to the owner is vital. Guidelines produced through this process become the basis for a BIM Execution Plan (BEP) for the project—essentially the road map for BIM goals, workflows and use. At the start of the design, when owner-defined information is embedded into the modeling process, it can be carried through the entire BIM project cycle.

After the Conditions of Satisfaction are established, it's time to use Lean processes to develop a plan for the best way to generate transparency and common understanding.

## BIM and Lean Integration in Building Lifecycle



These Lean processes can consist of collaborative Pull Planning sessions to develop and understand workflows and bring in stakeholders early in the planning process. This ensures things are done correctly the first time and eliminates rework. Using Reflections allows the team to review how well the plan is working to ensure the project is on track to meet the Conditions of Satisfaction.

A collaborative approach with BIM use has also proven to be very successful—it's the most effective way to use this tool. Establishing a "Big Room" where the entire AEC team can co-locate daily creates efficiencies and boosts communication. We've also seen more BIM teaching/learning happen in collaborative settings when people with different experiences using the same tool work together.

For example, Boston Public Library's Johnson Building Improvements project, which integrated new façade components and program areas within a contin-

ually operating public building, used the collaborative Pull Planning process to find solutions to design changes in less than 24 hours and complete the MEP BIM coordination two weeks faster than the original 8-week schedule.

Finally, as teams work more closely, a greater trust in model fidelity is developed, and the reuse of models increases as they move downstream.

**THE KEY TO SUCCESS**

Efficiencies gained from using a Lean approach have eliminated the need for owners to populate databases after turn over. This approach has also given them the ability to use BIM beyond the construction phase to bidirectionally sync data between FM software and Revit to keep as-maintained documents, or create a custom FM solution. It is important to note, however, that even as the technology improves, it is still human behavior that continues to be the key to larger

- successes. We have seen that the best teams employ the following strategies:
- Early involvement by the owner with their facilities and other user groups
  - The creation or strengthening of company standards and protocols
  - Clear definitions and goals provided to the design and construction teams for every phase of the project, especially post-occupancy
  - A commitment by all involved to break bad habits, suppress egos, and reinforce collaborative, supportive behavior. ☛

Kimberley Maul is Lean coordinator at Consigli Construction Co., Inc., Portland, ME, and can be reached at [kmaul@consigli.com](mailto:kmaul@consigli.com). Andrew Deschenes is director of project services at Consigli and can be reached at [adeschenes@consigli.com](mailto:adeschenes@consigli.com). This is their first article for *Facilities Manager*.

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