# Virtual Mock-Ups Streamline the Lean 3P Process

**By Mary C. Valmonte, EDAC**
*Senior Hospital Planner
and Project Manager
BCRA*

While Lean design--particularly Lean Production Preparation Process (Lean 3P)--is quickly becoming de riguer on healthcare design projects, even the 3P process itself is subject to streamlining with technological advances. By using 3-D computer models to simulate not only the look of the project but the actual flow of a space, designers can predict the necessity--and occasionally counsel against--the expensive, built mock ups of the past. In addition to saving the cost of building mock ups, the virtual 3-D model that allows for a virtual walk-through of a space can be done in a fraction of the time. In fact, the 3-D model can be drawn, tested, and turned into preliminary design documents in one short meeting. With a truly lean process--when all the players are in one room, making design decisions in real time to create a

model that is the basis for the actual construction documents--the 3-D model saves not just administrative and project expense, but the time, resources, and talent of those involved.
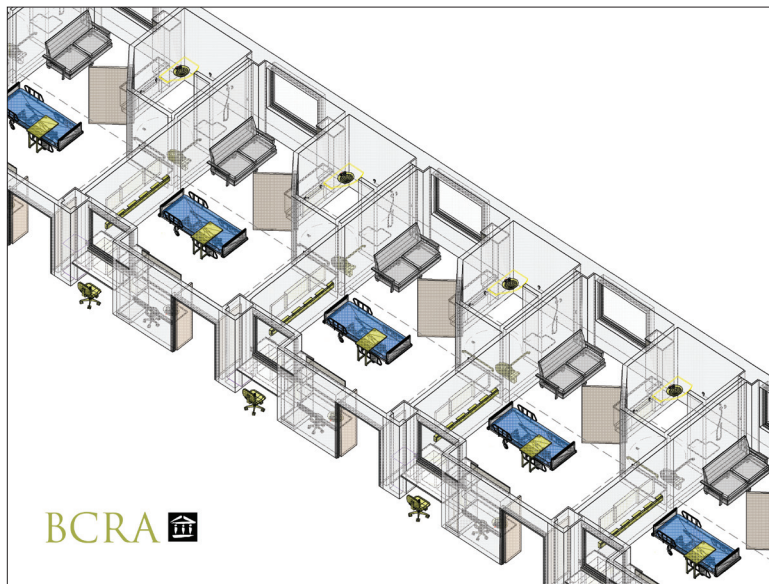


**Virtual 3-D Model of Hospital Rooms**

One of the appeals of doing a virtual mock-up is the overall convenience; essentially, a design firm is bringing the office to you. Even with a narrow or vague idea of what a project looks like, by the end of a meeting, a model with spatial distance and isometric angles can be complete.
All healthcare projects can begin

at inception from a 3-D perspective. BCRA uses software tools to directly translate electronic information from concept to complete design documentation without redundant or repetitive plans. At design meetings, drawings can be projected onto a dry-erase white board (or smart board, if available) so that end users can provide immediate feedback, and sketch over the drawing in real time. This interactive process allows the architect to make changes and see the results instantaneously, by switching between the 2-D drawing perspective to a 3-D orbital view with walk-through capabilities.

Members of BCRA's Healthcare Practice recently worked alongside a healthcare client that was dissatisfied with the 2-D plans they had seen. By using the 3-D modeling, BCRA was able to take the previous architect's bubble diagrams and manipulate them, moving and stretching them to positions on a plan that began to make

sense. Once the placement was set, the program was switched to a 3-D component and the bubble diagrams were suddenly seen as 3-D spaces. From there, the challenges were simple to address; it was easy to see rooms that seemed adequately sized when looking down at 2-D floor plans, but when you're moving in a 3-D space, not nearly enough space is provided for all the equipment and workflow as you see it from angles you "stand" at in a space—a mistake that would cost time, money, and resources to correct in a built mock-up.

Both large and small-scale projects are benefited with a 3-D visualization. While a virtual model can be an excellent replacement for a built mock up in a small clinic or project, it can also benefit projects on a much larger programmatic scale. Large projects often attempt programming and cultural change that accommodates Lean design principles and practices. A virtual mock-up allows testing of those Lean concepts before the built model is committed to (ie: how many steps will it take to get from the nourishment room or the medications room to the patient that's in the room at the end of the corridor? How does general layout of the building affect care delivery?).

Since elevations, walls, and cut lines are all included in the model, there's no need for several different drafted plans; one model is used. That model can even be used for interiors; cabinets, drawers, doors, and even colors and finishes are programmed into the model and easily adapted and changed, should modifications be necessary. Thus, a virtual model can be used not only to validate the built mock-up but is far easier to make changes to.

Built models are necessary for larger projects; providing a place to physically move allows staff and key players to "try out" a space with a degree of certainty. The 3-D modeling method BCRA uses is an extremely useful tool that maximizes the collective understanding of the project's conditions of satisfaction. By building a space that has already been validated and tested virtually, the savings of time and resources when costly modifications are not necessary can be enormous. From collaborative design through the adaptation process, finalization of plans and construction, the use of 3-D modeling is a tool that creates, maintains, and results in Lean management and tremendous savings.

*Mary Valmonte is a Senior Hospital Planner and Project Manager with BCRA. To learn more about BCRA visit www.bcradesign.com.*