Using Outcome-Based Design to Right-Size the Project Budget

Standard Financial Analysis and Productivity Data Help Align New Building Plans with Critical Goals

What determines how much a new project should cost? Given the ebb and flow of funding in the university landscape, one architect suggests that the conversation should focus less on the best building for the budget than on the best budget for the desired building outcome.

“Clients build buildings to accommodate human performance and to achieve an expected impact,” contends Mary Jo Olenick, principal and director of strategic planning at The S/L/A/M Collaborative, working out of the firm’s Glastonbury, Conn., office.

Whether productivity boost, technical breakthrough, or added prestige, a project’s impacts are bound to vary in importance, depending on the priorities of the associated stakeholder groups. Olenick has been collaborating with Robert Blakey, an expert in life-cycle analysis and principal of Strategic Equity Associates in Seattle, Wash., on a new financial model to quantify these divergent impacts with the goal of optimizing project outcomes.

Among other things, the new model allows monetary values to be assigned to specific outcomes so their benefits can be measured in terms that are universally understood. Olenick emphasizes that translating the outcome into dollars helps owners make meaningful choices about a project’s potential scope and features in the pre-program/pre-design phase, when they are apt to make the most meaningful contribution to building success. It also expedites the resolution of stakeholder conflicts. The data are also “played forward” to inform future projects, further enhancing their effectiveness.

“Our job as architects is only halfway done at the ribbon-cutting,” Olenick observes. “You don’t really know if a design is successful until people occupy the building. We need to follow that building through and understand its impact, and then later apply those lessons to upcoming projects.”

“It’s all part of a cyclic process, perhaps best described as outcome-based design,” Blakey adds.

Determining Values

One of the primary tenets of this new approach is that construction spending is just the tip of the iceberg of overall project cost, so by itself it is not an adequate yardstick. As Blakey explains, operations and maintenance over the building life can total as much as five times more than first costs. As the sphere of influence widens, factoring in salaries, productivity, business costs, benefits, etc., the number can swell to 200 times the project cost.
“The benefits of the research to the industries served can be a huge amount,” he says. “So the question becomes how to value the downstream potential of a project early on when setting the design and construction budget. As planners we have to look at what the owner really wants to achieve and put an economic value on that. If we can calculate an outcome, we can budget it.”

The process has a special advantage when it comes to dealing with traditional cost-cutting sessions, which can significantly detract from a facility’s productivity, Olenick explains. Putting a value on components outside the bricks-and-mortar category highlights those features that contribute the least. It’s much more effective than applying across-the-board cost-cutting, and even stakeholders with conflicting priorities can recognize others’ needs.

“Putting a value on both the benefits of doing something and the risk of not doing something is one of real pluses of this approach,” Blakey attests. “If we don’t do this, we risk narrowing the design and construction budget so much that the desired outcome could be completely eliminated.”

Tools

According to Blakey, many of the techniques used in the financial model have long been available. What’s different here is the way in which the tools (Monte Carlo simulations and life-cycle and productivity analyses, for instance) are being combined with new data to generate metrics and dollar values for a variety of outcomes.

“Many of these tools are standard accounting practice,” Blakey explains. “The U.S. government and large corporations use these types of simulations to make complex decisions, such as the impact of foreign exchange rate trends on budget appropriations. This is the first time this rigorous analysis is being applied to the design and construction arena.”

The data are being generated by several new studies that, in various formats, explore the impact of building design on productivity. One example is the positive correlation between daylighting and productivity uncovered as part of the LEED evaluation process.

“Productivity dramatically increases when building occupants are able to improve daylighting and their sense of control over the environment,” he relates. “We are beginning to put value on these factors, using well-accepted tools like Monte Carlo sensitivity analysis. The more items we can turn into dollar figures, the closer we get to the reality of the true benefits of the project.”

The hard numbers of the financial model go a long way in resolving conflict among stakeholder groups. As Olenick points out, people respond differently to dollar figures than they do to a feature like “sustainable.”
“The stakeholders can decide how much to discount any of the data points, but even if they do, the numbers are still significant,” she elaborates. “For example, an increase in productivity of less than one percent has a tremendous benefit. Having the line items identified makes it impossible to escape the fact that they exist and that they matter.”

She reports that during one university presentation the senior financial administrators were initially skeptical of the model. Never having seen the tools and data combined this way before, they posed some “hard, pointed questions.”

“When they took a step back they saw the overall message,” she continues. “Even though they may doubt some assumptions or disagree on the exact dollar amount, the relationships of the values to the other features were very clear.

“Some of those things are easy to measure, but some are not, like faculty effectiveness or faculty efficiency. There are ways to do it. If we can identify the goals, we can figure out how to actually measure them.”

**Finding the Right Budget for Stocking Hall**

Cornell University’s Stocking Hall is one real-world project where the outcomes-based financial model was applied, very successfully, to break a long-lived logjam over the “right” budget. An older structure on track for remodeling, Stocking Hall housed both public and private programs in food science and agriculture, through the State University of New York’s College of Agriculture and Life Science (CALS) and Cornell’s Department of Food Science. Upgrade proposals ran the gamut from a $25-million rehab to a $100-million replacement facility, with three other options in between. Multiple levels of stakeholders had been discussing the alternatives for almost 10 years without reaching agreement.

A joint S/L/A/M-Strategic Equity study described the hoped-for outcomes and metrics of the five stakeholder constituencies as follows:

- **Building level** Desired outcomes: “state-of-the-art,” efficiency, functionality, and flexibility. Metrics: lower operating costs and fewer OSHA violations.
- **CALS** Outcomes: attraction/retention, program reputation, growth, and image. Metrics: grant money, student test scores, and applications vs yield.
- **Cornell Department of Food Science** Outcomes: prestige/national reputation, leadership, financial asset, and master plan. Metrics: program rank and alumni support.
- **State food and dairy industry** Outcomes: industry advancements, the development of new technologies, and food product development. Metrics: number of inspectors/annual inspections, hours of training, and patents.
“There was a lot more to the facility than just housing a program. Factors like image, marketability of service, and so on also came into play,” Blakey comments. “We were looking to optimize, not minimize costs, trying to find that sweet spot in the middle where we get the most benefit from the project for a reasonable investment.”

Ultimately, he and the S/L/A/M team assembled a 70-page spreadsheet of data modeling the various options for Stocking Hall. They found the sweet spot in the analysis that identified about $200 million in benefits produced by a $100 million facility.

“The rigorous financial analysis we conducted provided the perfect justification to ask the state legislature for $100 million for the project,” he says. “We were able to show that the potential for increased productivity in the New York state dairy industry, and the resulting increase in tax revenue, more than justified the cost of the building project proposed.”

“The structured approach quantifies the outcomes, so all parties can see a common denominator,” adds Olenick. “They then understood that the debate was not about how much space, but about other variables. This approach recognizes those factors in a way that the typical conceptual evaluation can’t.”

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Biographies

Robert Blakey, the founding principal of Strategic Equity Associates, has more than 15 years experience in management, much of it in facilities and project management. Areas of specialized training include life-cycle cost engineering analysis, technological forecasting, systems engineering, property management and facility management.

As principal, Market Sector Leader for Higher Education, and Director of Strategic Planning at The S/L/A/M Collaborative, Mary Jo Olenick has dedicated her career to planning, programming and design for higher education. Her projects range from collaborative teaching facilities and high-tech academic research centers, to human-scaled, contextual residential complexes. She has spent many years in the establishment and maintenance of an up-to-date higher education database, making her an acknowledged leader in project benchmarking and the latest educational trends.

This report is based on a presentation given by Blakey and Olenick at the Tradeline College and University Science Buildings 2007 conference held in October.
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The S/L/A/M Collaborative and Strategic Equity Associates applied their outcomes-based financial model to break the logjam over the "right" budget for the upgrade of Cornell University's Stocking Hall, which houses food and agriculture programs. (Image courtesy of The S/L/A/M Collaborative.)

With a mix of public and private stakeholders, the Stocking Hall remodel had to meet a list of outcomes as diverse as state-of-the-art functionality, industry advancement, and image and marketability. (Image courtesy of The S/L/A/M Collaborative.)