LEAN, GREEN, IDEA SHARING MACHINE

By Charles S. Cook

INTRODUCTION

'Lean' and 'Green' are two of the most prevalent buzz words in today's design vernacular. The challenge to architects and designers is how to address these critical components without the perception of having to compromise amenities or quality. Applying a design methodology using techniques of bundling design requirements can lead to successful solutions without these compromises. Some of these fundamentals can be applied to all aspects of design, not just architecture, and in some ways to other areas outside of the design field.

THE CHALLENGE

An example of the application of such design techniques can be found at the Toyota Technological Institute (TTI) on the campus of the University of Chicago where programmatic and physical cues were used to formulate solutions that take facility design from functional to inspirational.

TTI is a mathematical research division of Toyota automobile company that enjoys a unique relationship with the University by employing PhD students in mathematical science to explore theories that will advance engineering practices. One of the critical factors the leaders of TTI realized well before any of the troubles at their parent company, is that they have many brilliant minds pursuing many great theories and applications but the ideas were not all being shared. People worked in isolation. This was compounded by the perceived barrier between long term staff and the more transient and younger student researchers.

TTI had space on campus for many years but suffered from the typical catalyst for a corporate move… they needed more space.

The new space that was selected was the top two floors of an old telephone switching station. The building was originally built half a century ago as a 'C' shaped footprint, with a 2nd portion later built enclosing the 'C' into an 'O', with an open court in the middle. This created a natural circulation around the perimeter much like a NASCAR race track. The floors were connected vertically by two stairs in opposing corners.

Beyond the need for more space, the client had a few programmatic requirements:

1) Provide convenient circulation on each floor and add a stair for more convenient and secure connection between the two floors.
2) Improve communication and promote idea sharing.

3) Create a comfortable atmosphere, less stark, that balanced their corporate and collegiate cultures in a way that also conveyed a moderate budget. They wanted the annual corporate visitors from headquarters to be impressed by the space without thinking it was extravagant.

Budget, Aesthetics, Culture, Circulation, Communication, these are all quite common elements to corporate design problems.

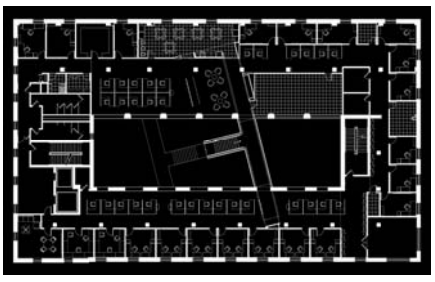
DESIGN APPROACH

When approaching a design problem, I recommend similar advice to what my Grandmother used to tell me about eating: "eat your least favorite first, everything after that tastes better". I believe in taking it a step beyond that, not only should you solve the most difficult elements first, but whenever you can, take what is the biggest problem and make it into a feature of the solution.

In this case, the biggest problem was improving circulation. Many options were explored for new penetrations in the floor plate at different locations to solve the vertical circulation problem. At the same time improvements to horizontal circulation were reviewed, quickly coming to the conclusion that given the divide created by the center court, the only way to do this was to build a bridge across the court, at both levels.

Beyond addressing the most difficult obstacles first, the best design solutions are often those that merge challenges and solve several requirements at once. This approach of bundling goals led to the idea that the best way to solve the vertical circulation issue was to offset the bridge location at each floor and build a floating stair from one bridge to the other in the center of the atrium. Effectively changing the circulation pattern from a NASCAR oval to the likely interactions of a figure 8 demolition derby.

The challenge with the implementation of this idea was that because the two halves of the building were built at different times, the existing openings to the atrium did not align across from each other to create logical connection points for access to the bridge. The initial reaction was to modify the masonry openings to create alignment. But this meant one side of the atrium would have a pattern that did not relate to the openings below, resulting in a less aesthetically pleasing composition.



The eureka moment came with the realization that instead of spending money to move the brick openings to align so that the bridges could be square to the wall, it was far more dynamic (and less expensive) to keep the opening locations where they were and set the bridges at an angle to connect them. This would celebrate the uniqueness of each structure, while solving the needs of both horizontal and vertical circulation, advancing the solution from functional to inspirational. Taking the biggest challenge and making it a feature.

This solution became the catalyst for many other design features that were all provided to promote interaction and **idea sharing**. The bridge connection points were placed to link zones that needed to be

accessed by staff and students. On the fourth floor, the bridge links the open office area to the café space. The fifth floor bridge links open office space to the classrooms and lab spaces.

The result is that the visually dynamic stair is also the most convenient stair. The intent was to help funnel people through one area so that they would have the opportunity to interact. At the bridge arrival points, 'Idea Lounges' were created to allow conversations that are generated by the calculated serendipity of the central stair to continue with the support of conveniently located marker boards and comfortable seating.

To help demark these link zones, several visual icons were used. The carpet color was changed at the bridge to a darker terracotta tone, complimentary to the brick walls of the atrium. This accent carpet was extended beyond the bridge as a pathway to the outer walls of the perimeter corridors to visually identify these connection points.

Furniture groupings were also used to signify these connection points at large nodes. At the open office side lighting towers and upright work tables are visible from far across the space. At the north side, clustered tables and chairs flanking the carpet path also signify the locations of the bridge.

A third and most visually prominent feature are the grid walls. At the end of each skewed cross path is a grid wall set perpendicular to the skew. This results in the grid walls projecting partially from the corridor walls, again making them easily findable when walking down the perimeter corridor. When crossing the bridges the grid walls act as the focal point to terminate the cross circulation spine. Thought should always be given to what your eye sees when drawn down a pathway- whether created by walls or furniture systems or flooring or ceiling treatments, the end point should be articulated. It may be a window, a niche, a piece of art, something to add visual value to that natural focal point.

An additional and important feature to this solution was the integration of white boards into these visual icons. This integrated a practical amenity that helped promote idea sharing and problem solving. The idea of white boards or chalk boards to allow people to share thoughts is not a new one. In the movie 'Good Will Hunting' a prominently placed chalk board with an unsolved formula provided the opportunity for the lead character to solve a problem that others couldn't, ultimately changing his life.

Idea sharing can help to advance individual ideas, improve business and/or provide social benefits. The design of a physical environment can have a dramatic impact on achieving these benefits. Sometimes referred to as creating "We Space", it is important to locate these spaces in accessible central locations and even more effective when near a place where one might naturally be inclined to have some 'relief time' with comfortable furniture that will promote interaction. At TTI these "we spaces" were provided outside of the café space and near classrooms and labs where people were likely to run into each other, and might be inclined to stop for a minute to have a conversation because they were already in the mind set of taking a break.

STAYING LEAN

In today's economy, every project has a 'tight' budget, but in some regards this can be a good thing providing designers the catalyst to think creatively. Would engineers have developed new light weight polymers for airplane chassis if the price of fuel had actually decreased over the last several decades? Probably not. We now have really fabulous plastic chairs, beautiful carpets made from recycled plastics and flexible trim that decades ago only a plasterer could produce. Economics spurred creativity and the same holds true for architecture and interior design.

Merging Solutions to stay within Budget

For designers of spaces and buildings, budgets guide every decision and often shape solutions that otherwise might not have been pursued. A projects budget is not just controlled by less expensive material selections, it can also be reduced by merging multiple programmatic requirements into a single solution. Examples of this approach were demonstrated at TTI where previously mentioned grid walls of white boards were provided to promote idea sharing and also as icons to help signal circulation nodes and 'we spaces'. The cafeteria space needed to occasionally be able to handle larger groups. So a large 'we space' was placed directly adjacent to create this 'flex space' with a large sliding barn door that allows the rooms to be used separately, or during catered functions the door can be closed most of the way leaving just enough access for catering staff. Additionally the large door serves an even more useful purpose whether it is open or closed because the door is also a large grid wall of white board prominently located where everyone will see it and any thoughts that might written there. Merging programmatic requirements into a single solution helps a project stay in budget and often results in a more dynamic and well appreciated solution.

SENDING THE RIGHT MESSAGE

Every project conveys a message to the visitors and occupants about the spaces owner and/or their brand. Sometimes the client has a strong message about their culture that they want conveyed, others may not. But even a generic office space with no perceivable concept is conveying a message to others.

Often, the message conveyed is the most important aspect of what designers do for their clients. In the TTI Case Study, the client wanted to strike a balance between providing an attractive environment that would help entice prospective PhD students and staff to join their efforts but at the same time did not appear excessively expensive. They have an acute sensitivity to the perception of both the executives from corporate that paid the bills and prospective sponsors of grants for some of the research programs. The facility could not have the appearance that they were wasting money. Additionally, this facility had to articulate a balance between its corporate parents and its academic family. It could not look too much like corporate America or too much like a typical academic space.

To make sure that the importance of education and research was visibly identifiable the class rooms and laboratories were placed along the central atrium with large glass walls so they could be easily seen from most locations on both levels. This was a sensitive issue because they were also concern about intellectual security due to the fact that they develop cutting edge theories and solutions that they do not want to be 'stolen' by their competitors. So privacy shades were also provided along the glass lines to allow for this control when needed. The relief spaces outside the classrooms also convey the message that the intent is not just to learn and then retreat to your cubicle, but to linger and discuss what was just presented with your peers.

Simple materials were used throughout to help maintain the budget and to convey message of thoughtful restraint. Even in the president's office library, very simple wood profiles convey a more utilitarian approach. Exposed brick walls save money and set the stage for a color palette for paints and carpets in warm earth tones that provide a visual and tactile sense of casual comfort. The expectation was not that students would sit in circles eating smores and singing campfire songs but they would have a sense of comfort and camaraderie.

At TTI, simple furniture systems utilize independent work tables to subtly convey that the environment is adaptable and not stagnant. Furniture in the 'we spaces' is primarily comprised of groups of work tables at writing height and task chairs to help keep discussions collaborative and focused instead of lounge like which might promote more personal discussions. The use of stool-height tables allow for easier transition from a standing conversation to perching and lingering to complete an exchange of ideas.

Environmental awareness and sustainable practices are demonstrated throughout the space. Low VOC paints, carpets and furniture systems were used as well as materials with recycled content. All offices, restrooms, libraries and classrooms have light controls that are activated by motion and sound so that the lights in uninhabited spaces automatically turn off. The central court harvests daylight into the interior of the building footprint so that virtually every space in the facility has the benefit of natural daylight to minimize or eliminate the need for artificial lighting during the day. Open work space lighting has dual settings to allow for lower light levels cutting consumption in half, and cubicles have individual task lighting to provide extra light only where needed. The HVAC runs off of a central steam system utilized by many buildings on campus for efficient heat, and the cooling system is multizoned with heat recovery to take advantage of natural convection of the center core.

The open central stair encourages all inhabitants to walk instead of taking the elevator from floor to floor, saving energy and promoting physical activity. Showers were also provided to promote the riding of bikes to TTI.

CONCLUSION

There are many factors that must be considered when creating successful design solutions. In today's environment, if a project can send the right message through design and aesthetics, develop efficient solutions that solve multiple programmatic requirements at once to help control the budget, and promote communication that will enhance the work experience and improve output, its inhabitants and owners will likely be considered a great success.

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