Double Jeopardy

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--Models of Repetition

In the early 20th century, Detroit was in the unusual position of being the poster city for two competing models: *Fordism* and the *Arts and Crafts*. At the same time that Henry Ford's manufacturing assembly line was making Detroit the landmark city of the Industrial Revolution, the city was also becoming internationally regarded for a movement crafted in response to it through George and Ellen Booth's Cranbrook School (1927). Ford's model of efficient repetition is typified by a cycle of mass production and mass consumption of standardized goods which could be sold inexpensively. This uniformity of efficient machined goods was exactly what Booth saw as dehumanizing and resisted through the reinstatement of the individual handiwork of the craftsperson.   Fortunately today, these models are not seen as mutually exclusive as current technologies have enabled architects to operate between them, especially at small scales.

--Dialogic

The commission to design and build *two* student lounges, with student employees, afforded us the possibility to explore how the opposition between machine and craft could be re-negotiated through the technologies and available to us within a school of architecture. Given that the *two* sites are located at opposite ends of a symmetrical building and had recently been fitted with another faculty design/build project by PLY architecture, we understood the challenges posed by this project as:
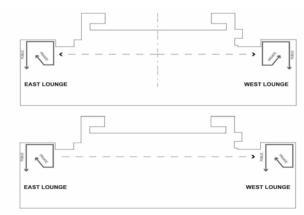

West lounge from corridor

Dialogic Sites: Twinning
How does one design/build project dialogue with another when their constraints are entirely different? How can we avoid simple duplication or a tabula rasa approach? How does a single diagrammatic model effect and get affected by multiple sites?

Dialogic Models: Efficiency without Monotony
What opportunities does "doubling" afford us? How can we construct difference between the two lougnes while duplicating as much of the design and fabrication as possible?
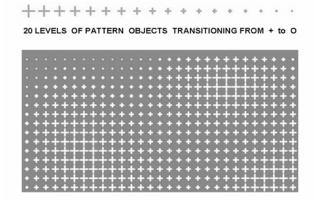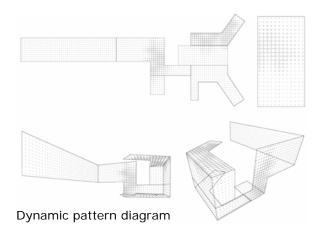
Site strategy options: mirror vs. slide

Dynamic pattern diagram

--Dialogic Sites

We utilized the same diagram in the same orientation (rather than mirroring it) at opposite ends of the symmetrical building. The use of a single diagrammatic strategy afforded us conceptual efficiency while retaining a high degree of spatial diversity. Unlike the "mirror", which imposes site priorities to the diagram (contextualism), the "slide" better mediates between the identity of each site, optimizing repetition. The resituated diagram also changes the lounges' relationships to their surroundings and creates difference in the interior character and programmatic emphasis. The East Lounge is a more concealed space since it has less exposure to the main corridor than the West Lounge. The result is that the East space is used for small group and/or individual activities and the West space is used for larger meetings and social events.
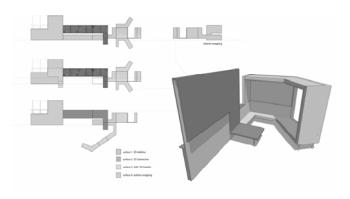
We then extended this strategy into a diagram that could generate the character of surface

, pattern, and light. The lounges are located along a south facing wall retrofitted with interior plywood sunshades [by PLY architecture]. We wished to incorporate these screens into our design and felt the most appropriate way was to derive our surface approach from them. These shades modulate sunlight through holes of varying depths milled into stained plywood. The challenge of the surface diagram was to arrive at a system that could be a derivation of this language. Rather than modulate light though depth, or 3-D subtractive, we chose to modulate the surface and artificial light through shape, or 2-D. The result is an indeterminate geometry defined by the strict control between a point and a line. We devised a repeatable non-uniform use of patterning which could regulate form, material, and light. This geometry enabled efficient replication of standardized and non-standardized construction elements.

Emerging geometry between point and line

Fold, unfold, refold

East lounge approach
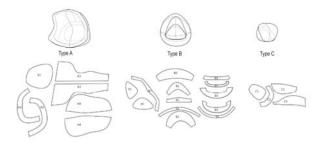

West lounge approach

--Dialogic Models

This strategy also enabled us to minimize construction time and cost by duplicating the fabrication of elements. The changing yet precise relation of surface to form demanded that we work through digital modeling and fabrication. Crafting the digital work as a process of "full-scale" design necessitated a closer link between the craft of hand work and the efficacy of mechanical repetition. Essentially physical construction was frontloaded to digital construction. This process of forming seemed to alleviate some of the typical onerous on-site fabrication with an easily modifiable construction model.

Deriving the pattern through a simple transformation of moving from 3-D to 2-D and back to 3-D, we experimented with the relationship of pattern to surface by unfolding and refolding the form to create a family of surfaces which adapt to the formal contours. The subsequent design of the panels and supporting structure was directly transferred via RHINO models to numerically controlled systems, like the router and laser cutter.

Using Flash, Photoshop, Illustrator, and RHINO we were able to rather efficiently generate a diverse set of techniques that could be used in a variety of materials and instances—structural framing, tufting buttons, acrylic lenses and plates, fabric patterns for bean bags, and heater grilles—enabling a controlled variety between the two sites. The lounges contain 6,854 custom cut acrylic pieces—5,060 for light lenses and 1,794 for tufting buttons for felt cushions

Bean bag construction templates

The increasing hybridity between concept and artifact, design and fabrication create new and exciting conceptual possibilities for architecture. For one, it opens a form of practice that does not have to approach repetition as exclusively resistive or imitative. As architecture continues to incorporate techniques of scripting, algorithms, prototyping, and CNC fabrication into its production, established models of authorship, representation, and material are being challenged. Former oppositional legacies, like those of Ford and Booth, are becoming conflated through the new modes of craft in the digital/material arenas.

Client: University of Michigan
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Project Team: Mark Davis, Neil Thelen, Matt Saurman; Leigh Stewart
Photographer: Beth Singer

West lounge interior