A Critical Analysis of Design Processes and Media: Applications for Computer-Aided Design

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Architectural designers take part in two complex cultures: a parent culture that affects their overall view of the world, and an architectural subculture that orders the details of their work. With assistance from writings in contemporary philosophy, this paper analyzes aspects of both the parent culture and the subculture as they concern design processes and media. The analysis uncovers assumptions that normally assign such processes and media to a secondary role in which they serve only as neutral and transparent skills. By constructing a set of alternative assumptions, the paper proposes a new, primary, role for design processes and media — a role that enables them to act as intentional and substantial generators of form. These alternative assumptions challenge deeply held beliefs, but examples show that when they are employed experimentally in computer-aided design, they reveal new possibilities unique to digital processes and media.

Introduction

In The Reconfigured Eye, William Mitchell (1993, 223) argues that digital imaging technology is "destabilizing the old photographic orthodoxy, denaturing the established rules of graphic communication and disrupting the familiar practices of image production and exchange." Mitchell’s book concentrates on photography, but we who use digital imaging in architectural processes and media cannot avoid the inference that Mitchell’s argument applies equally to our work: digital technology will destabilize, denature, and disrupt established rules and practices in architectural design. Thus we must consider the author’s further warning that “this condition demands a fundamental critical reappraisal of the uses to which we put graphic artifacts...”

Advancing such a reappraisal is the purpose of this paper. In the first part of the paper I will offer a critical analysis of how architectural designers use graphic artifacts such as design processes and media. In the last part I will bring forward three experimental examples of how findings from the analysis might be applied in computer-aided design. The analysis will be fundamental, as Mitchell advises, in that it will begin by examining the underlying cultural settings in which design processes and media function.

Cultural Settings: Assumptions about Design Processes and Media

Two cultural settings profoundly affect the lives and work of architectural designers. The first of these settings — that of a parent culture — influences, and may even be said to constitute, the designer’s basic attitudes and beliefs about the world. Similarly, the second setting — that of an architectural subculture — orders the particulars of what designers do in design and how they do it. Aspects of the parent culture as well as the subculture concern design processes and media.

A parent culture is no simple entity. Cultures are inherently messy and diverse, as Linda Goar states in a recent article on the significance of cultural philosophy for architecture (1992, 144). And Lawrence
Cahoon, one of the philosophers Grant introduces, describes culture in similar terms. In his book The Dilemma of Modernity, he writes that culture is "an ever-changing plurality of activities, events, and artifacts, each involving multiple meanings, continually being reinterpreted and reconstructed." (1988, 248) The messiness of the cultural setting does not imply unbridled self-expression, however; participation in a culture (which human beings cannot avoid) necessarily involves many tacit but limiting assumptions. One such assumption provides Cahoon's central theme — that there is a fundamental subject-object dichotomy so rooted in the history of Western culture that it pervades every action of every person in that culture. For architects, this dichotomy prescribes a fundamental subject-object relationship: in the parent culture, architectural designers are tacitly assumed to be the subjective presences who act (with others) upon an external objective reality to produce a building.

Consistent with the subject-object dichotomy of the parent culture, the architectural subculture makes further assumptions about the particulars of design processes and media. One principal assumption concerns the sources of form. Because the dichotomy forces attention to its poles, it is easy for designers to assume that the primary generators of architectural form must be located there, in the subjective experience and intuition of the designer on the one hand, and in the objective issues of program, context (broadly construed), and construction technology on the other. And, because design processes and graphic media lie between (or, perhaps, aside from) the poles of the dichotomy, designers do not normally acknowledge them as significant generators of form. The graphic conventions of this secondary and in-between location, developed in late medieval art and brought to architecture by Alberti and Leonardo in the early Renaissance (Robbins 1994, 17; Herbert 1993, 29), are shown in Albrecht Dürer's woodcut (Figure 1): the single fixed viewpoint of the subject, the fixed object and, between subject and object, the transparent fixed frame. Today's conventions of architectural representation, whether in manual design, as shown in the work of Robert Venturi, for example (Figure 2), or in a student's computer-aided design (Figure 3) — even in the conceptual stages of the work — reflect the same conventions exactly.

Figure 1: Albrecht Durer. Draftsman Drawing a Nude. 1525. One of a series of 4 woodcuts showing devices for mechanical construction of perspectives.


Figure 3: Lawrence Martin. Computer Drawing for design studio. May, 1994, Kevin Matthews, instructor. Reproduced by permission of the Department of Architecture, University of Oregon.
Three corollaries derive from the subculture's principal in-between assumption: architectural designers typically assume that processes and media are neutral, transparent, and timeless. First, the subculture make it seem self-evident that design processes and media can be treated as neutral, that the designer's intent in using them will not affect the content of the work. Designers usually assume, for example, that they do not materially affect program elements by objectifying them in conventional geometric diagrams.

Second, designers normally think of processes and media as transparent in that they can engage and represent the external objective world as it really is (or, in the case of design, as it might be) without introducing any graphic biases or screening effects due to the processes and media themselves. For example, designers are likely to assume that a massing study will deal with the same issues whether it is drawn hastily with a soft pencil, carefully with a straightedge and pen, or digitally with a computer.

And third, designers assume that process and media are timeless in that the objective world can be expected to stay put while they act on it — just as Dürer assumed that the perspective setup did not need to record changes in the artist's (or the model's) position that occurred during the time it would take to make the drawing.

Thus practitioners, writers, students, and teachers dealing with design in either handmade or computer-aided processes and media find it natural to agree with the tacit assumptions of their subculture.

With a few exceptions, they tend to treat design processes and graphic media as essential but invisible skills, ready to be filled with content and meaning by an objective external reality. Under these assumptions, spatial representation is confined to a kind of graphic paraphrase of the static, mechanistic reality invented in the Renaissance — a world that is increasingly disconnected from the space, time, and motion that characterizes 20th century Western culture. And, despite findings in other contemporary arts, sciences, and humanities, this form of representation contains no hint of uncertainty, ambiguity, or the limits of knowledge.

When applied to current computer-aided design systems, this analysis suggests that by incorporating obsolete assumptions about processes and media from the main body of architectural practice, CAD systems necessarily fail to engage the dynamic and contingent world described by Mitchell, Groat, and Caloone. Computer-aided systems replace handmade operations that are stable and certain with electronic analogues that are equally stable and certain. Although they are expressed in digital technology, these analogues keep the same fixed subjects, fixed objects, and fixed transparent frames illustrated by Dürer. Even CAD walk-through simulations offer only a linear, prearranged sequence of mechanical perspectives.

More to the point, these effects of digital imaging technology are directly opposite from those Mitchell describes for photography. In photography, digital technology challenges old orthodoxies, but in architectural processes and media, rather than challenge obsolete rules and practices, digital technology validates and reinforces them. Perhaps, for both handmade and computer-aided design, architectural designers ought to welcome some means of destabilizing, denaturing, and disrupting conventional approaches to design processes and media. If, as this analysis suggests, old assumptions have foreclosed a direct way to open architectural design to the hazards and opportunities presented by digital imaging technology, then perhaps an indirect way — based on new assumptions — will answer.

**New Assumptions about Design Process and Media**

New assumptions — especially if they are to be fundamental — are not easily arrived at. Conventional assumptions are so basic that they affect the very structure of thought, so they necessarily resist reappraisal or replacement. Caloone's work provides a way around this difficulty, however.

In *The Dilemma of Modernity*, Caloone rejects the traditional subject-object dichotomy as unsuited to the present world, and joins other contemporary philosophers (Groat 1992, 138) in suggesting another view. This alternative view sees culture as partly fusing subject and object: "cultural orders are a part of the nature of [a] thing, part of what it is," he writes, and "artifacts, words, and material things which are culturally experienced, interpreted, and created are part of the human beings who experience, interpret, and
create them, part of what they [the human beings] are" (262). Taken together with his earlier description of the dynamic complexity of culture, Cahoon’s formulation suggests that culture is not a second order mediating factor that stands between subjects and objects. Rather, culture is a primary constitutive process by which individual persons interact with others and with the material and immaterial world; these interactions are like a field that continuously redefines and reconstitutes the individuals in it as well as the entities they interact with.1

Such a formulation may be used as a pattern to unset the subject–object dichotomy in the architectural subculture: for culture substitute design process and media. In this approach, design process and media are not secondary, but primary; they are the field in which the designer interacts with others and with the material and immaterial world in design. Thus, instead of assuming that the designer is a subjective presence who acts on an external objective world, an alternative view would recognize that both the designer and the information about the material world of buildings are not merely aided, but actually constituted through the ordered production of drawings, models, and words of the design task.

This architectural formulation of Cahoon’s cultural approach makes it possible, working in parallel with the earlier discussion of traditional assumptions, to propose fundamental new assumptions for the architectural subculture. As before, I see a new principal assumption with related corollaries. Instead of the earlier principal assumption that processes and media are secondary and in between, processes and media must now be assumed to be primary and constitutive. A constitutive role for processes and media does more than just avoid the separation of subject and object — that is, the designer and the other elements of the design task — it absorbs, redefines and integrates them.2 Then the generation of architectural form is a function of the design process and medium (or media) in which the design task is conducted. The designer’s experience and intuition as well as the issues of program, context, and construction technology are all rendered indeterminate because they are all continuously redefined as functions of processes and their related media.3 Process and media, so construed, are primary, or at least coequal, generators of form in design. And, as before, 3 corollaries follow from this new principal assumption.

The three new corollaries can be stated as conceptually opposite to those outlined in the earlier discussion. Where processes and media were described before as neutral, transparent, and timeless, through the new corollaries I will characterize processes and media as intentional, substantial, and timely, discussing each in turn.

Considering the first new corollary, what would it mean to call media and processes intentional? One possible meaning would be that the designer would accept processes and media as essential embodiments of his or her intention toward the other elements of the design task. Such acceptance is not just a pedantic quibble; to take it seriously is to bring forward a new source for architectural form. For example, Bernard Tschumi, in his Parc de la Villette project (Figure 4), set up an explicit process and a medium (a grid of squares) that constituted his intentions toward the program: its elements were to be broken apart and distributed according to a stated geometric rule (Tschumi 1992). Tschumi’s move served not only to generate form, but also to redefine the program, the site, and the designer through the processes and media of the design task.

Figure 4: Bernard Tschumi: Programmatic Deconstruction, 1985. Reproduced by permission of Bernard Tschumi.

And what of the second corollary — that design processes and media would not be transparent, but substantial? Treating processes and media as substantial would necessarily bring new issues to the
the design task. Issues generated out of a specific sequence of actions (that is, design processes) and the character of the particular graphic artifacts (that is, media) that embody them would become a primary source of architectural form. The notorious non-objective drawings of Coop Himmeleblau, for example, preempt the conventional first place of objective analysis in the design process. And Peter Eisenman’s graphic search for a graphic strategy for a project at the University of Cincinnati shows how marks on paper can become substantial rather than transparent (Figure 5).

Figure 5: Peter Eisenman: Conceptual sketch for DAAP, University of Cincinnati, 1982 (part). Reproduced by permission of Peter Eisenman.

Here the radial lines in the plan appear to be just like any other lines. But they are not; instead of normal lines representing physical forms or spaces, they are special lines indicating an action. Drawn through vertices of an abstracted plan of an existing building complex, they trigger the application of rules for segmenting the curve and for a forced articulation of materials and spaces not dependent on objective issues of program, context, or construction technology. As I have noted elsewhere (Herbert 1993, 65) these lines are a new kind of graphic entity that Eisenman’s search for a graphic strategy has forced onto the drawing page. They are always intruding themselves into the foreground of the working process, and, since there is no object for them to represent, they cannot be treated transparently.

Finally, as a third corollary, processes and media could be assumed to be timely. Since both making and viewing a graphic artifact such as a drawing always involves the on-line interactions of a living individual — that is, a designer — with other elements of the material and immaterial world, the design task would be treated as occurring in real time: not timeless, but timely. Computer walkthroughs or flybys do incorporate time explicitly, but in rearranged sequences; I will introduce another approach that uses time implicitly in non-sequential arrays (I will discuss design applications of these arrays in the concluding part of this paper). Such arrays were first developed by British artist David Hockney. Like Eisenman, Hockney has challenged conventional concepts of seeing and representation. In 1982, he developed the multi-view photographic compositions he called “joiners” (Figure 6) and their free form derivatives (Figure 7). These compositions combine aspects of Cubism and findings from scientific research on visual perception (Weschler 1984, 8). They also associate photography with drawing.

Figure 6: David Hockney: Henry Moore, Much Hadham, 23 July 1982. Composite Polaroid, 21” x 33” Copyright David Hockney.
processes and media can be primary generators of architectural form. And, even as the analysis confirms that new assumptions do challenge familiar rules and practices in our architectural subculture, it also provide a basis for experimenting with new approaches to computer-aided design.

Experimental Applications for Computer-Aided Design: Three Examples

Of the three examples that follow, the first and second are student projects from recent architectural design studios I have conducted at the University of Oregon. An explicit premise of these studios is that media and processes as well as program, context and technology are foreground issues, that is, I instruct students to treat design processes and media as intentional and substantial (Herbert 1992). The third example, which treats processes and media not only as intentional and substantial, but also as timely, is from my own current investigations. All 3 examples are experimental inquiries rather than concrete applications in practice.

Example 1: Analytic Diagram as a Generator of Form

This example concerns a 10-week studio project. The program for the project described a retail sales art gallery for an urban infill site. After a short sketch problem in which students used handmade media and normal design processes, I asked students to specify and then conduct an alternative design process, including an alternative approach for either handmade or digital media. The student whose work is shown here, Matthew Janssen, combined digital and manual processes.

Working Method

Janssen used a computer drafting program to make an abstract site analysis diagram showing geometric proportion combined with outlines of shadows cast by adjacent buildings (Figure 8a). He exported this diagram into a “fractalization” program (Figure 8b), and then into an image manipulation program where he subjected it to a series of filters and rotations and added other fuzzy sketched lines, all in color. He interpreted the resulting image as a floor

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Hockney has observed that these works are more like drawing than they are like conventional photography (p. 13). Furthermore, time and motion are implicit in the action required to make and view the composition. Making and viewing occur only in real time, during which the maker, the viewer, and the world cannot stay put. Hockney’s compositions connect perception and expression to the human experience of duration and space (p. 33).

The foregoing analysis suggests that new assumptions can make a difference in how graphic artifacts are used in design. Indeed, through the work of Tschumi and Eisenman, it suggests that design
plan (Figure 8c), and then overlaid this with precise “ordering” lines (Figure 8d) that reflected his preliminary understanding of program issues. Taking the new image through several types and cycles of filters, and sketching with various menu tools, Jansen produced a series of floor plans (Figure 8e, 8f) and related studies of particular features such as a stairway (Figure 8g). He excerpted and rotated parts of these plans, reinterpreted them as sections and then developed them further (Figure 8h). Similarly, he returned to the developed floor plan (Figure 8i), and reinterpreted and refined it as a perspective (Figure 8j). After Jansen had generated and developed the schematic architectural forms in this manner, he used prints of them as a basis for manual overlays that incorporated normal requirements for program, context, and construction technology. He also used prints for interim reviews in the studio and as references to make his final drawings by hand (Figures 8j, 8k). The computer drawings were not sequential; Jansen had several windows (not interactive) open at the same time. Color, although not shown here, played a significant role in all his interpretations.

Comments

Three aspects of this example seem significant. First, processes and media were foregrounded in the work in that all issues were initiated by and derived from the designer's interaction with the computer. The original site diagram was treated not as a transparent representation but as a self-referential image to be elaborated by computer processes and then mined for graphic artifacts. And, although the subject-object dichotomy was thereby suppressed, the result is rich: the designer's intuition and experience are enhanced without losing sight of issues of program, context, and construction technology. Second, the schematic studies are uniquely a product of digital imaging technology. Although the computer drawings do not stretch the limits of paint programs, these graphic artifacts were generated outside the designer's current intuition and experience; they provided new information accessible only through the computer. The drawings are also unique in the designer's deliberate application of computer effects to generate (rather than represent) architectural form. And third, some of the processes and media used in this project might be incorporated into a 3D modeling routine. Under such a routine, ambiguous drawings might be made into 3D objects early on. Or, better, 3D object drawings might be ambiguised and carried to completion in 3D. Even if vectors were conventionally defined by coordinates in the computer's memory, the display might be shown in any specified degree of ambiguity for further manipulation and revision.

Example #2: Scanned Images as Generators of Form

This project was part of a studio foregrounding media and process similar to the example described above, except that the program called for a 10-story retail/office building. After an initial sketch problem and a first attempt at schematic design using manual processes and media, this student, Francis Dardis, introduced a series of computer operations involving scanned images to extend his design vocabulary. He then returned to manual processes and media to finish the project. Dardis had had previous computer experience in office drafting, but had not before used scanning or image manipulation programs.

Working Method

After his early work on the studio project with manual drawings and conventional study models, Dardis constructed several specialized physical models (Figure 9b). Small and abstract, these models were intended as sources for scanned images. Through several trial-and-error stages, he found that transparent and reflective mylar models, laid directly on the scanner glass, produced the most evocative results (Figure 9b, 9c, 9d). Evocative, in this context, meant that it was possible for Dardis to find architectural interpretations — such as "this suggests a pattern of functional spaces" — of the images. The scanned images were printed out as a basis for discussion and evaluation with others in the studio. Having selected some images for further study, Dardis manipulated them through several computer filters and drawing operations, developing them in directions suggested by his understanding of programmatic and contextual issues (Figure 9e, 9f). On tracing paper overlays, he drew by hand to interpret the computer drawings as conventional plans, sections, elevations, etc. (Figure 9g), constructed a series of physical study models (Figure 9b), and then a final model (Figure 9i).

Figure 9a: Francis Dardis. Model, scan and computer manipulations for design studio. April, May 1994; Daniel M. Herbert, Instructor. Reproduced by permission of the Department of Architecture, University of Oregon.
Comments
The observations noted for example #1, above, concerning the foregrounding of media and the uniqueness of computer-generated information apply also to this example. Three other observations are of interest. First, Dardis’s use of the computer as an accessory to extend his interpretive vocabulary differed from other such uses. In other accessory uses, say, for massing studies or as an underlay for manual perspective renderings, the computer’s graphic representations are still treated as neutral and transparent; for Dardis, however, they were explicitly intentional and substantial. Second, this investigation imposed new demands. As it began, Dardis intended only an excursion to extend his design vocabulary. But the excursion turned into a major change in direction for the design: Dardis found himself involved in unfamiliar architectural forms and new issues for program and context as well as for construction technology. Third, the description above makes the process seem more straightforward than it actually was. A “stumbling process” is not unusual, even for experienced designers in practice (Herbert 1993, 22), but, experiments such as Dardis’s make the student’s task still more difficult and confusing: he found that it involved frequent detours and dead ends.

Example #3: Implications of Multi-Window Computer Displays: Timely Design by Means of Episodic Fragments
This project is a current experiment of my own, an investigation of a process that is also in progress. The project was inspired by the resemblance between Hockney’s photographic compositions (Figures 6, 7) — with their implications of time required to make and to observe a graphic artifact — and the multiple-window displays common to several current computer-aided design programs. The investigation speculates about the time-related effects of the designer working not with a single view of a whole building but with an array of partial views. Following an observation of Joseph Escherick’s (Herbert 1993, 32), I call such partial views episodic fragments. Initial computer images for the project were produced by Janine King in the Design Integration Laboratory at the University of Oregon.7

Although the 3D modeling program King used for the images supports up to 6 interactive windows, such interactions were not included in the project described here.

Working Method
The basis for the investigation was the front view (in 3D) of a demonstration model that King was using in the lab for current research and development (Figure 10a). She generated an initial group of 6 windows through the modeling program and exported them to an image-manipulation program. By further exports from the modeling program, she increased the image to 9 (no longer active or interactive) windows — an amount that filled a 17” monitor screen with “workable-sized” mini-windows about 3-1/2” W X 2-3/4”H, each with a different episodic fragment (Figure 10b).

Figure 10 a, b: Computer displays. 1993 Reproduced by permission of Design Integration Laboratory, University of Oregon.
Following Hockney’s example, King deliberately offset the images in adjacent windows. Next, guided by Hockney’s extended format, I increased the number of windows. Because more than 9 windows would exceed the capacity of any available monitor to display them, I worked by hand. I cut and pasted photocopies of the initial 9-window image (Figure 10b), constructing a 32-window collage (Figure 10c), breaking up and offsetting the images from the earlier step and manipulating their scale. I kept the notion of window data lines, but followed Hockney’s lead in the irregular circumstantial composition. If this were an actual computer display, the array of windows shown would require about a 34” diagonal screen (or multiple monitors), and if it were an interactive working model, 40 to 50 mgs of memory. My next
processes and conventions of representation. Perhaps the need for a design concept is only a result of the information-processing limitations of a design process based on handmade media (Herbert 1993, 123). If, as modern theories of perception suggest, a building can be known to its users only through a series of timely episodic fragments, then perhaps the designer ought not to imagine that he or she is in privileged and timeless possession of the design concept.

What would it mean for a designer to work with such a fragmented design concept? Consider 3 diagrams showing different versions of the design process (Figure 11). In the first diagram (Figure 11a), our conventional version: starting at the left, we try to converge as quickly as possible toward a central design concept from which we can then organize all the remaining developmental decisions until the concept is realized (at least symbolically) in the drawings, and the design work is done. But if we had a large number of interactive windows showing the project in episodic fragments, the computer’s programs could organize and coordinate the physical aspects of our developmental decisions electronically as we go along. Then, as shown in the second diagram (Figure 11b) — we might find a kind of

![Diagram](image-url)

**Figure 11a,b,c:** Design concept diagrams, Daniel M. Herbert.

Comments

In addition to the foregrounding of media and the uniqueness of computer-generated information noted for the previous examples, two other comments relate specifically to the project’s timeliness. First, multiple windows could introduce time into design in a way that is unique to computer-aided systems. If a CAD system displayed, say 50 interactive windows, the designer might proceed from one view to another — always in the real time that it takes a real person to act — making entirely local adjustments that would be coordinated dimensionally only by the computer. The building’s designer would be able to see the emerging design as a real observer sees a real building, never as a whole object seen all at once, but only in partial episodic fragments that must be integrated by his or her cognitive system. Second, such design by timely incremental local adjustments to fragmented images challenges conventional notions of design concept. The investigation suggests that the convention of the design concept — that is, the overall spatial and thematic organization of a project — may be an artifact of the Renaissance design.
evolving proto-concept, never quite done because the process would remain open. The design concept then might be thought of as plural rather than singular, as indeterminate summings-up of whatever had happened up to the moment of observation. Moreover, because there is no reason in principle to confine observation to the drafting table, the design concept would continue to evolve and widen through construction, use, and re-use, with design drawings incorporating space, motion, and time, as integral but always indeterminate parts of the working process. And, if the array of windows were expanded to include aspects of the building’s physical, social and historical context, such a widening, interactive concept would inevitably intersect those of other past projects and generate future ones (Figure 11c). Managing complexities of this order seems to require digital rather than manual processes.

Can such speculations have anything to do with architectural practice? In a recent article on design in a contingent world, Mark Hewitt (1994) points out that “fewer and fewer architects design freestanding [...ec., “object”] buildings and an ever increasing segment of the market for design services is devoted exclusively to adaptive reuse” (p. 197). Hewitt goes on to ask: “What if buildings were seen as precarious, contingent pieces in larger preexistent order? What if the artifact and its environment were... considered a morphologically continuous, temporally fluid system...?” (p. 200). Thus it seems possible that the experiment described here may apply to emerging issues of education and practice in the next decades.

Conclusion

From the foregoing analysis and examples, it appears that new approaches to architecture could result from new assumptions about processes and media in design. These new approaches reject the assumption that design processes and media provide neutral and transparent representations of a determinate, timeless, and objective reality that is independent of our presence in it. These approaches involve living minds, eyes, and hands acting in real time; and they acknowledge that designers always act with limited knowledge in a contingent world. It also appears that such new assumptions — perhaps derived from sources outside architecture — will be necessary if we are to explore the possibilities of digital technology in our work.

Furthermore, it appears that under new assumptions about the role of processes and media in design, Mitchell’s argument does hold for architecture as well as photography. We must expect that as we explore the potential of digital imaging technology, it will indeed destabilize our old orthodoxies, denature our established rules of graphic communication, and disrupt our familiar practices. We cannot confine digital technology to its present role as clever office helper. It will force us to engage issues in design for which we have few precedents.

Notes

1 Tarnas (1991) includes an overview of the transition from modern to postmodern thought in philosophy, linguistics, literature, physics, biology, and other disciplines.

2 Seebohm (1994, 24) discusses the implications of designer-computer interactions as affecting “our understanding of ourselves, our culture and our world.” See also Edmonds (1993) on the same topic.

3 Hewitt (1994, 197) argues that “the objectification of building design and artifact conservation, following modernist theories of architecture and art history, has created an artificial temporal and formal disjunction between historic buildings and their evolving context.” He goes on to advance a “theory of the intermediary” that “deobjectifies the design task.”

4 Mitchell acknowledges (without actually endorsing) the possibility of such a changed status for media and process: “a medium that privileges... indeterminacy, and heterogeneity, and that emphasizes process or performance rather than the functional art object will be seen by many as no bad thing.” (1993, 8).
This is not to suggest that treating processes and media as substantial is the only way to bring new issues to design. Other approaches include both manual and computer applications. Manual applications form the main body of design over the past centuries. For computer-aided design, see the publications on transformations (Cigolli and Coleman 1990), shape grammars (Stiny and Gips 1982), fractal applications (Yessin 1987), and multi-layer historical mapping (Hewitt 1994, 201). See also Herbert (1992) and (1993, 7).

Other examples of non-objective lines in architectural design might include an axis or a set of guidelines such as Le Corbusier’s Modular. These are imposed by convention from outside the current design task, however, whereas Eisenman’s radial lines are derived from inside it.

In contemporary practice - including the works by Tschumi and Eisenman cited here - addressing issues of processes and media in design has become associated with the stylistic movement called deconstruction. This movement, whatever its merits, has thus by association imposed its ideological and stylistic program on these issues. I have found, however, through teaching studios over the past 5 years that engaging processes and media as design issues can produce results in the mainstream of contemporary design.

Proprietary programs used in example #1 were: for drafting diagram, Generic CAD; for “fractralization,” Fractal Attraction; for image manipulation, Adobe Photoshop 2.0; for composing and printing review pages, Aldoas Pagemaker 4.2.

Proprietary programs used in example #2 were: for scanning and image manipulation, Adobe Photoshop 2.5.

Proprietary programs used in example #3 were: for 3D modeling, Artifice DesignWorkshop 1.1; for image manipulation, Adobe Photoshop 2.5.

References


