Old Wine in New Wine Skins: Architecture, Representation and Electronic Media

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Architectural computing too often is dissociated from the central culture of architectural discourse and traditional means of working. This paper proposes that one way to bridge this gap is to introduce electronic media in the context of a process-oriented theory of architectural representation—one that is principally concerned with issues of intention, intention, and perception. This approach to the use of computers in the design process requires the introduction of a morphology of representational media that are intrinsic to the architect and his making, and foregrounds pedagogical emphasis on electronic media’s ability to perform in conjunction with the design intentions of these various representational forms.
Introduction

"We find that all theoretical determination and all theoretical mastery of being require that thought, instead of turning directly to reality, must set up a system of signs and learn to make use of these signs as representatives of objects. Only in the degree to which this function of representation awakens itself does being begin to become an ordered whole, a structure which can be clearly surveyed."

—Ernst Cassirer

If Cassirer’s declaration is true of being in general it remains, among the fine arts, arguably most true of architecture. It is indeed the ‘assertion of the representational function’ upon the architect that dominates his process and controls his musings. As one particularly vexing professor of mine once remarked, “Architects don’t build buildings. They do drawings.” As worrisome as this comment was at the time to a young architecture student interested in seeing his conceptions made corporeal, it has become one of those invaluable bits of simple wisdom which grows only more powerful in its implications and more indomitable in its application. As architects we work in a realm of abstractions and symbols that both communicate our intentions and mediate our conception. Ours is a world of lines and patterns which announce mass and texture; doodles and gestures which alter existing objectives and states of affairs; smudges and opportune coffee stains which take on meaning if found next to the appropriate marks on a page.

Traditionally, those of us over in the “computer” end of the architectural world have not been viewed as sympathetic to this type of discourse (after all, coffee stains and computers don’t mix that well). We are more comfortable with the “logic of architecture” — not the visceral and temporamental. Ours is a language too often hidden in the computational (or of late, the virtual), but it is rarely found in what one might simply call the architectural. In the search for “newness” we have potentially disengaged ourselves from sociological, psychological, and historical aspects of the process of making a culturally relevant architecture.

For all the proselytizing of electronic media and the prophesying of the coming “virtual world,” little in the realm of architectural computation has affected any significant change in this process of making. We can, like Frank Gehry, now digitize our clay models into the computer and thus, suddenly, give definite geometric form to otherwise arbitrary mass. And we may even, like Peter Eisenman at the University of Cincinnati, be able to generate three-dimensional grids so our contractors can actually build the thing. But in the end like the myriads of architects for the thousands of years that have come before us, we each are still unscathed and quite unafraid of that intimidating task of marking what Aalto termed “the white table” (or, now, “the blank screen”). And it is at this moment that each of us entering into the act of making — whether by traditional or electronic means — mediate ourselves and our architecture between conception, intention, and perception. It is at that moment that we begin to ponder the dance between what we think it is, what we want it to be, and what it might become.

This process must by necessity begin with conception which can be defined as the mental act of initiation. It involves the creation of a mental picture or schema. Although there are notable exceptions (for example, Mozart was purported to have composed entire symphonies in his head before ever putting a pen to paper), conception generally exists only in an embryonic, or even pre-embryonic state— at the level of the logos. It therefore has no tangible or deliverable form, no voice and no means of communication. It requires a host— something to hold it, give it birth, make it corporeal.

The form conception will eventually take is bound up in intention and perception. Both are intimately related to issues of communication and meaning. Intention speaks to the inner purpose of the author. It provokes reasons for the choices an architect makes — not only in terms of his architecture, but more poignantly in how he
chooses to proceed with the process of making. Why do I reach for the piece of charcoal as opposed to a crayon? Why use an electronic environment rather than a paper one? What am I seeking to communicate about my design?

In discussing the issue of perception one can become overwhelmed with the mechanisms of seeing and the psychology of cognition. This is not my intention. Perception in this context is meant to speak to the communicative aspect of a given choice made by the architect - how the representational function affects the audience's "visual thinking." In this context, the maker must also be seen as a participant. In other words, issues of perception begin to animate and effect not only the product but also the process as the architect enters into a creative figuring act - that is, a psycho-social activity that the designer/architect engages in that "produces the maker and the object, and thus encapsulates the process and its product." (Liptad 1988). Simply put, the designer and the representation are involved in a process of informing each other.

The representational form - whether electronic or "traditional" becomes the embodiment of this process. It is the bridge of meaning which connects these sometimes disparate triads. The choices we make, the media we choose, and the forms we employ ultimately inform our making and shape our architecture.

This concept is obvious enough in the "real world" (try slicing a loaf of bread with a hammer and chisel), but it is often overlooked in architecture. And it is this transforming power of the representational process that accounts for the fact that our concepts and our products do not often "look" the same. These distinctions exist not only between the mental image and the finished building, but also between the various representational modes an architect may employ.

No one choice can communicate every aspect of the work. Each mode of representation is limited in the intention it speaks to and the perception it allows. While each form in which our architecture takes shape contains different and potentially new meanings.

One way, then, for the computer to meaningfully participate in the act of making in architecture, is to present it in the context of such a process-oriented theory of representation. This, of course, requires a reevaluation of the nature of architectural representation by moving away from its traditional artifact-based definition and the historical concerns of style (e.g.: presentation drawing, type (e.g.: plan, section, elevation), and technique/medium (e.g.: ink on mylar), and towards a new emphasis on the relationship between the triad of perception, intention, and perception. The beginnings of one such alternative theory has been put forth by Mark Hewitt who proposes that the study of representation should bridge the gap between architectural history, intellectual history and design methodology (Hewitt 1985).

One possible means of implementing such a theory would begin by identifying a taxonomy of representational forms which are relevant to the architect and his process. These classifications, which may be garnered from research, experience, and experiment, would each stress a specific intention in the design process and suggest diverse perceptual implications.

If the architect is introduced to electronic processes within this representational context, it begins to allow us to evaluate the role of these processes on the making of architecture within a non-exclusive and culturally relevant context - that is, outside the parochial realm of 'architectural computing' and within the cultural discourse of architectural process and history. This is precisely the point at which the traditional dominant paradigms in computer-related architectural investigation tend to break down. These standards of investigation, which I would identify as computational/shape grammars, parametrics, intelligence, etc., model-based (3D animation, visualization, etc.), and paper-based (drafting, drawing, painting, etc.) ultimately suffer from (among other things) limited architectural inten-
tion and, within the context of this paper, the persistent endurance of a definition of architectural representation which remains artifact-based rather than process-oriented.

This focus also allows the computer to move beyond the very specific status of a tool and take on the more informing role of media. This last point cannot be over-emphasized. Marshall McLuhan’s definition of a medium as “any extension of ourselves” remains most useful in helping us understand how and why we use different media for different purposes. But potentially more illuminating are his assertions that the content of any medium is a different medium and each subsequent medium is an extension of a previous medium (McLuhan 1964). The implications of such an assertion are potentially bewildering in view of the metamorphic powers of the computational environment (now a drafting board, now a paintbrush, now a spreadsheet). One must speculate if the computer, like McLuhan’s declaration about electric light, may indeed be about pure information or at least, in its current manifestation, a repository of all previous media.

That debate aside, this understanding does ease the existing strain on the dominant trends in computer-related architectural investigation to generate new and different representational expressions. For example: “We should focus our inquiry in how today’s and near-future electronic representations will help us carry out significant aspects of architectural work in new and more advanced ways than traditional representations. We need to deal with the unique ways in which electronic depictions address architectural issues, elements, ideas and design problems.” (author’s emphasis) (Bermudez 1995)

It also allows those of us brave enough to admit the obvious—that all of today’s and “near-future electronic representations” are ultimately extensions of existing forms. And, in fact, when considering issues of conception, intention, and perception, there may not be any “new and more advanced ways than traditional representations.”

**A case study**

This premise formed the basis for *Representational Issues of Computer-Aided Design* which was offered in the Fall of 1995. The students, who ranged from first and second year Masters candidates to 5th year undergraduates, had access to a smorgasbord of software options which included Photoshop, Painter, Illustrator, Canvas, PageMaker, MiniCAD, AutoCAD, Form-Z, 3D Studio, Strata Studio Pro, and Premiere. Hardware options included Power Mac 8100/850 with 34 Mb of RAM and Pentium PCs with 32 Mb of RAM. Additionally, the School of Architecture is fully networked. And although each student had to work with a 15 Mb network disk quota, local hard drives were available for temporary use and Zip or Syquest drives were available on all the Macs. A pre-requisite was the *Introduction to Computer Applications in Architecture* course or its equivalent.

The pedagogical goal of the course was to pursue a design through the exclusive use of electronic media by focusing on the specific architectural intentions of various representational modes used throughout the design process. This was to be accomplished in a manner that was technically non-prescriptive—that is, at no point in the class were “appropriate” software packages recommended or taught. The students were left free to choose the ones they found were capable of delivering for them the desired result. Technical-software issues were tackled as they arose on an individual basis. One potential downside to this approach was that students tended to remain with the packages they were most familiar with.

Each student began by selecting a specific (sub)urban typology to serve as the programmatic basis of their semester’s work. As this was done in a 3-credit seminar format (not a studio) the choice of building types of limited scope was encouraged. These ranged from convenience stores to pedestrian bridges to gas stations to grain elevators.
Through the vehicles of assigned readings and in-class discussions, the students were asked to recommend a list of representational forms used throughout the design process. These can be summarized as follows: Speculative Drawing, Poetic Drawing, and Notation. This list, of course, is by no means definitive, but it did serve as both a starting point for the investigation and an illustration of one potential procedure. Further classifications are to be encouraged and would hopefully stimulate more potential.

Each student was then to systematically pursue his or her design with a focus on the prescribed representational mode and its accompanying intentions. Most students seemed comfortable with this approach from a methodological point of view as, in reality, this was not very much different from their usual habit. But the compelled conscious inquiry about the nature of their drawings proved somewhat unsettling.

The first stage of engagement in the process were Speculative Drawings. Speculative drawings
are those that document the process of inquiry (Graves 1977). They refer to a mode of representation that is concerned with an internal examination of questions specific to the intentions of the design. They are both contemplative and exclusive—that is, made primarily for edification of the designer.

The first of this type of exploration was to create a diary of observations about their particular building type through the use of photographs, video, and/or sketches. (Figures 1-4). These were to include "filtered" observations, which revealed a specific or unusual character, electronic "sketches" which could be created by working "on top" of photographs, and collaged/composited descriptions, speculations or diagrams about their specific typology and/or the experience of a place.

Each student was next required to prepare a program and choose a site for a design of their own. Preparatory studies were to be engaged in via various encouraged means: sketches, overlays and diverse compositing techniques (found images, drawing/drawing, drawing/photo, vector/raster, video/still, electronic/hand). (Figures 5-8). At the end of this phase it was intended that each student have a relatively stable design.

The students were then asked to speculate on the "unseen" of their design. (Figures 9-17). The Poetic Drawings were intended to allow each student to communicate a mood, emotion or some other enigmatic affection or characteris-
poetic drawings
drawing into the unseen

Figures 9 and 10: Brent Dykstra

Figures 11 and 13: Jan McNeel

Figures 14 and 15: Jonathan Barros

Figure 16: Sara Beltran and Carmen Platero

Figure 17 (right): Carmen Platero
tic; to express the indefinite and the sublime. These representations deal in: "traces of the memory and the dreams of the drawer; outbreaks of temperament and wit, provocations of the observer, riddles, vague evocations or gestures of philosophical theses...They lead into optative landscapes...they are sustained by the magic of the indefinable." [Meisenheimer 1968].

The students were asked to establish a scope of reference that lay beyond the specifics of their architecture and even possibly the architectural idea.

Lastly, at the point of considering the design "complete," a series of traditional notational exercises were to be undertaken. Figures 8-20 The Notation can be defined as an instrument of clarification which intends to objectively identify a specific architectural experience. Its success in establishing this experience is usually dependent upon the appropriate and correct use of a symbolized notation as well as the rhetoric of graphic convention. It demands an audience skilled in the interpretation of the particular notation system, while its intention is descriptive of a specific architectural characteristic (e.g.: the distribution and arrangement of positive and negative space in a horizontal plane). It therefore remains a highly abstract and conceptual mode of representation. The result of these exercises were intended to be more typical presentation quality line drawings, renderings with color, shadow and texture, and or more annotative documentation (details, dimensioned or descriptive notations).

observations and conclusions

There are numerous observations and questions about our little experiment that range from curious to noteworthy. For example: Why did the students refuse to experiment with Painter, yet were comfortable “drawing” in Photoshop? Why
were they reluctant if not adamantly against using a stylus and pressure sensitive tablet as opposed to a mouse? Why were photographs and other scanned images freely manipulated, composited, collaged, etc. yet first generation electronic products (e.g.: CAE drawings and models) were typically left unaltered?

But the anecdote which is most germane to this inquiry remains the, “Is that what you’re looking for?” question asked by most students early in the semester. I am confident this reflects neither the general state of higher education in this country nor a lack of clarity to the course, but rather the uneasiness the students were feeling when forced to use the computer/software in a manner that was not necessarily within the ‘manufacturer’s recommendations’ and certainly out of context to previous use—that is, no longer as a specific tool employed for a specialized task (e.g.; present a perspective view, draft a line drawing, establish a parametric variation, etc.) but as medium of true speculation and architectural investigation.

The judgment this inevitably suggests is that it was plainly apparent at the beginning of the semester that electronic media was never really seen as a “design tool.” And when forced to use it in that context, the students, at least at first, found the computer awkward, cumbersome and uncomfortable.

In this context, it is interesting to note that the vast majority of the speculative work (i.e., the referential sketches and preparatory studies) was carried out in raster-based software—that is, without the use of “CAE” software (in either two or three-dimensions) This seems consistent with Daniel Herbert’s assertion that, “CAE systems do not address the issue of drawing as a means of thought; instead they see drawing as a means of recording preconceived decisions” (Novitzki 1995).

Additionally there was a distinct lack of modeling throughout the semester. One wonders if this was merely student predilection or, if in the context of a process-oriented theory of representation, the computer-based model lacks a necessary degree of ambiguity and abstraction that allows for speculation and an intrinsic reproximity between mind and act. One must conjecture if the model, much in the nature of a notation, allows for the examination of a specific architectural intention (e.g.; what the building looks like from a certain point of view) but does not generally spur further potential.

In any case, if allowed to be optimistic about the work accomplished in the course, the general feeling of anxiety among the students was gradually assuaged. This may in some part be due to the change in focus to representational forms that are potentially more sympathetic to electronic processes, yet the range of expression and distinctiveness of the work apparent testimony to the students’ ability and willingness to embrace the computer in this context.

Moreover, their work is hopefully exemplary of the power of the representational process in the making of architecture and, specifically, the making of that architecture in an electronic context. By ultimately forcing the computer to perform within the design intentions of a specific mode of architectural representation it ultimately freed the students from the baggage of expectations they had about both the machine in general and the specific application they may have been exploring. And in the end this is good, for they were able to fit electronic media into the context of making architecture in such a way that it did not demand the total reevaluation of what they do.

Electronic media will undoubtedly change the face of architecture—just as assuredly as the automobile changed the face of travel. But after all, in McLuhan terms, an automobile, as distinctly unique as it may be from a horse, is ultimately just another way to get from one place to another. And in this case, where we still want to go is to Architecture. And how we still get there is from that moment of conception through the mediated process of representation.


