

Inquiring Between Digital & Analog Media: Towards an Interfacial Praxis of Architecture

JULIO BERMUDEZ
University of Utah

As the powershift from material culture to media culture accelerates, architecture finds itself in the midst of a clash between centuries-old *analog* design methods and the new *digital* systems of production.¹ Schools and offices are confronting this very real situation as they struggle to integrate computers in their work without having clear methods, techniques, and theories to relate old and new systems of production. Recent investigations on the use of multiple iterations between digital and analog media to advance architectural production show promising results. However, these experiments have not yet developed a theoretical foundation tying these procedures and approach to a larger conceptual framework. This paper articulates the relevancy of such interfacial propositions in light of the forces driving our contemporary civilization and profession. These premises are further clarified in the productive context of a design studio.

BETWEEN DIGITAL AND ANALOG CIVILIZATIONS

Since its origin, architecture has been the art of organizing physical reality, the act of establishing the material order of a cultural order. This has meant to work *in, with* and *for* the analog (i.e., material, embodied, tectonic) world. However, as our civilization moves deeper into the information age, cultural expressions become under increasing pressure to 'virtualize' its sources, processes and products.² Our jobs, relationships and entertainments increasingly demand less and less from the physical world. Neither muscle nor even material presence are truly important in more and more tasks. From ATM machines to television to telecommuting to the internet, contemporary life depends on substituting the presence of materiality by means of information (i.e., non-material) technology. In today's culture of the simulacrum, the concrete loses ground to the representational, the corporeal to the informational, the real to the simulational.³

At first sight, it would appear that architecture should be at odds with the rising culture of virtuality. Can architecture deal with a world in which construction cannot compete with the speculative stock market and the ephemeral MTV? This

problem, far from being limited to architecture, extends to all areas of our lives. In effect, as one's location, presence, and identity are intrinsically tied to the physical (body and world), the new developments place us in the midst of a struggle: the ancient, primordial calls of the body and its instincts collide with the cultural demands of detached rationality, immaterial action, digital production and consumption.

Clear examples of this struggle are visible everywhere. Take for instance today's glorification of the body and material consumerism. The huge popular draw of sports (albeit mediatized), the fashionable physical fitness and healthy lifestyles, the mystification of physical beauty, age and sex, and the use of legal or illegal drugs to enhance the sensorial experience of bodily existence indicate the presence of some social/personal mechanism of compensation. Our daily escapes to materialism via consumer society serve a similar purpose. We keep on purchasing goods in the unconscious hope that they might give us enough weight to counteract the ungraspable and uncomfortable lightness of virtuality. In other words, the more our civilization draws us into virtual and disembodied cultural events, the more we seek the security of the physical world. Everyday, we de-facto craft precarious armistices defining our juggling with the forces of the digital and the analog.

Architecture is in a unique position to reflect and respond to the potential schizophrenic condition of being unable to balance virtuality and reality. For the technological mutation underway is forcing a major change not only in our culture at large but in our profession as well. On one hand there is a clear shift from analog to digital modes of architectural production. The resulting transformation is profound enough to challenge our traditional representational systems and transitively the way we think and practice architecture. On the other hand, the mentioned cultural changes are requiring architectural responses that are sensitive to the tension between the virtual and the material. This puts contemporary architects in the difficult task of redefining architecture's purpose, technology, functionality, and aesthetics based on the needs and visions of the rising new civilization.

The premise underlying this paper is that as much as virtuality is intertwined with the ordinary fabric of our reality, so should it enter (albeit critically) our architectural practice and theory. This situation has only begun to be examined let alone understood. The great majority of our built environment continues to be designed and made following an ideological and productive agenda that precedes and thus does not acknowledge the digital revolution except in its most obvious and superficial manifestations. From this standpoint, there is a need, indeed a duty of the profession and academia to address this situation. Moving forward requires a realization that a physical/material interpretation/production of architecture proves limiting at a time when information and media environments are the major drivers of culture. It means to proactively incorporate the emerging digital world into our traditional analog work. It means to change.

BETWEEN DIGITAL & ANALOG REPRESENTATIONS

As architects depend on representations for the design, communication, and criticism of architecture, depictions are not 'just' working tools but the very *universe of discourse* (i.e., language, symbolic and conceptual space) wherein architectural work must unfold. *The type of representational media and technique one uses has a direct and lasting effect in architectural making and thinking.* Hence, the dramatic changes in architectural representations being brought about by the shift from analog to digital modes of architectural production make it unavoidable to expect a comparable degree of change in architectural practice and thought. Whether we like this or not is an irrelevant matter, for the digital revolution is as unstoppable as the industrial revolution was 150 years ago.⁴ The challenge is how to harness current technologies and paradigms to advance the cause of good architecture. In other words, the issue before us today is *how the representational techniques and technologies of the information age do and will affect architecture.*

Considering that it is the qualitative differences of one mode of depiction from another that define the nature and value of each type of representation,⁵ our questioning ought to be directed to what is special or unique about electronic media. We should focus our inquiry in how today's and near-future digital 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 way(s) in which to digitally address architectural issues, elements, ideas and design problems. And in order to grasp that nature, a *dialogue* between the manual and the electronic modes of production needs to be encouraged and carefully studied.

Extremist approaches that deny this necessary interaction — by either easily surrendering to the digital or stubbornly resisting it — should be seen with great caution. In fact, such radical positions, born more as re-actions to the momentum

of the digital than in a clear understanding of media, are a great disservice to architects. On one hand, the nature and degree of development of today's electronic media cannot outperform and thus does not grant the erasure of proven, centuries-old analog methods of production any time soon (if ever). On the other hand, the rejection of digital media certainly does not help the profession seize the new electronic possibilities that are impossible to attain via manual methods.

Extremist approaches lack the necessary criticality, sensitivity and sophistication to tap into the opportunities that invariably exist in the space of betweenness. For it is in the gray areas where the dialectic processes unfold and new techniques, knowledge, and ideas first arise. It is also there where the true nature of the (seemingly) opposing ways of doing, thinking and communicating can be uncovered, grasped. The future thus is not *ahead* (in the digital) but *between* (the analog and the digital) . . .

TOWARDS AN INTERFACIAL PRAXIS

The previous arguments show the need to develop *an interfacial praxis of architecture* that addresses today's productive, theoretical and cultural territories between material (analog, tectonic) and media (digital, virtual) civilizations. *Praxis* (from the Greek doing-action) is meant as a productive condition in which

“... thought and action (or theory and practice) are dialectically related. They are to be understood as *mutually constitutive*, as in a process of interaction which is a continual reconstruction of thought and action in the living historical process which evidences itself in every real social situation. Neither thought nor action is pre-eminent. In *poietike* [from the Greek, making-action], by contrast, thought (the guiding ideas or *eidōs*) is pre-eminent, guiding and directing action; theory directs practice. In *praxis*, the ideas which guide action are just as subject to change as action is; the only fixed element is *phronesis*, the disposition to act truly and rightly.” (italics in the original)

At this stage, the challenge in developing an interfacial praxis is methodological and paradigmatic rather than technical. For most architecture offices and schools already possess all the necessary technology to support this inquiry.⁷ What has been missing is the approach and theory to bridge the gap between analog and the digital systems of production. Although we have known that there is a territory lying between them, we have not had the necessary maps to explore let alone colonize it. This is a perfect job for academia. Lacking the market pressures of practice, schools are in a good situation to look at this problem and push the profession to a new level of competence.⁸ Actually, this has been already happening. Recent academic investigations on the use of multiple iterations between digital and analog media to advance architectural production show promising

techniques, methodologies and results.⁹ However, these experiments have not yet developed a theoretical foundation tying their procedures and approach to a larger conceptual framework. This paper has tried to close the gap by articulating the theoretical relevancy of such interfacial propositions in light of the forces driving our contemporary civilization and profession.

APPLICATION IN DESIGN STUDIO

This conceptual framework is applied in a design studio. The major premise is that the dialogue/collision of analog and digital systems of architectural production can be utilized as a metaphor and vehicle to address, study, and advance contemporary cultural and architectural discourses. The studio carefully looks, probes, and builds at this *interface* focusing in how architectural design is (in)(de)(re)formed by iterative media processes and environments. The *poetics of representation* (and not its technicalities) is the driving force behind the interfacial praxis of architecture. Following are the main pedagogic and working conditions used to frame the studio.

Students are placed in the space laying *between* the analog and digital systems of production and requested to use either of these systems as design tools to advance architectural ideas. There is a bias toward digital technology to acknowledge the growing pressures to convert to electronic media that is present in architectural practice (and to counteract the natural conservative tendency to stick to centuries old analog technology). Particular attention is paid to (1) analog modes of production that appear hard or impossible to be displaced by digital technology; and (2) electronic methods that are unique to digital production. The studio requires students to keep a critical attitude towards selecting the right medium for the right job. In this sense, the studio is *critically pragmatic*: we settle for what works, that is, for what best moves forward the architectural inquiry.

Great importance is placed in shifting between digital and analog systems of production. Requiring multiple iterations between media helps designers (1) progressively realize the *relationship* between different systems and thus understand their differences and strengths — this also develops bridges between the media; and (2) clarify what is being developed. Translating something requires a re-formulation that sharpens understanding. Re-interpretation is an opportunity to deepen and advance architectural ideas. Students usually pose conscious or unconscious resistance to these shifts as (1) they originally see them wasteful, time-consuming, and unnecessary or (2) they fall too comfortable working in one media and stop communicating between systems. Both kinds of resistance are persistent and need to be broken quite a few times before the iterative process becomes second nature and media shifts are seen as beneficial.

To enable a parallel theoretical development, building programs facilitating the examination of the ongoing cultural-technological transformation are selected (e.g., a build-

ing combining officing services and a bathhouse, an on-campus international center supporting cultural exchanges between real and virtual communities). A proto-theory of architecture based on the interfacial concepts of *hybrid*, *symbiosis* and *dialectics* is used as a framework for debate and production.¹⁰ Working between the productive systems driving the changes in our profession and civilization *in the context* of building programs that are being impacted by those same forces helps designers to (1) think of larger conceptual and theoretical issues and, at the same time, (2) focus on procedural and methodological aspects of production. The basic conditions for an interfacial praxis of architecture are thus established.

Warm-up problems are used to give students a jump start into a non-traditional and interactive use of analog and digital media during the design process. The aim of these highly experimental exercises is not solving the design problem but instead developing fundamental ways to realize (as making real and making aware) an interfacial praxis. The warm-up exercises purposely avoid the use of CAD and promote image and video manipulating software. This achieves two things. First, it breaks down students' technical preconceptions concerning computers and puts them in a different state of mind that is more conducive to new theoretical and productive opportunities. Second, it shifts the attention to alternative digital-analog conversations that de-emphasize the capacity of digital media to deliver objective depictions of architectural space and therefore are more akin to the unclear mental states associated with the design process.

The studio organizes students in teams of 3 people to guarantee a diversity of interpretations and to have enough critical mass to simultaneously work in analog and digital media. Students are asked to rotate between systems and become surrogates or representatives of a particular media, thus guaranteeing a dynamic equilibrium between them. Although rotation is required, certain students become "experts" within their teams at particular analog and/or digital tasks.

Finally, the studio rejects the traditionally pristine, clean, dry, hygienic computer lab atmosphere. Rather, drinks, food, materials, physical modeling, drawing, music, etc. are all welcomed in the lab. This decision comes out of the obvious fact that nobody can truly design in a computer lab. The physical environment wherein designers work have to permit states of mind, behaviors and interactions that support and not inhibit design production. And as these are by definition serendipitous, messy, free, dirty so should the lab be. Furthermore, if we want a fluid interface between systems of production we have to put them next to each other physically to allow unconstrained dialogue. Thus computers are brought into the traditional studio and analog equipment is moved into the computer lab. The result is an extended productive space without the traditional separation between computer lab and design studio. No special treatment (except security) is given to the digital tools which thus join

the analog instruments in a common ground posing no undue friction to their interaction.

PARTING WORDS

Today's state of productive and cultural liminality calls for a dynamic equilibrium between the digital and the analog systems of architectural production. We need both systems as each one opens different praxial territories that are inaccessible by the other. And what is even more important, their interaction generates synergistic opportunities that transcend by far their own individual strengths. The diversity of tools and approaches offer not only more choice but also liminal conditions wherein the new breakthroughs lie. Awaiting . . .

We need not confuse the encouragement of interfacial relationships between analog and digital media with a *superficial* accommodation of electronic media into the existing analog framework of the profession. By superficial it is meant the use of the digital in a way that (1) mirrors analog work except that is faster and more seductive (e.g., drafting, graphics, walk-throughs) and (2) is not integrated within the design process — electronic media is used *after* and not *during* the design process. Instead, we need to develop a critical praxis that draws its energy and production from the dynamic equilibrium between virtual and material systems of architectural production.

The ongoing studies on the relationship between digital and analog media are beginning to help us develop in this direction. However, much remains to be done. In this sense, this paper shows, to the probable delight of many tax-payers, that great academic economy is possible by combining research and pedagogic goals within a same working environment. A studio can be designed to reflect on the condition of our civilization and the profession (ideology, theory), develop new methodologies and techniques that are directly applicable to architectural practice (methodology, design process, representation), and teach these very same essential subjects to students (pedagogy).

REFERENCES

- ¹ Analog systems of architectural production use tracing paper, vellum, graphite and ink, clipboard, clay, balsa wood, plastic, metal, etc. Analog systems have also been termed "hand-made," "manual," or "physical." Digital systems of architectural production use scanning, image manipulation, visualization, solid modeling, computer aided drafting, animation, rendering, etc. Digital systems have also been called electronic, computer-aided, etc.
- ² There are ample evidences and arguments supporting this statement. See Peter Drucker, *The Age of Discontinuity. Guidelines to our Changing Society* (New Brunswick: Transaction Publishers, 1992). P. Kennedy, *Preparing for the Twenty-First Century* (New York: Random House, 1993). J. Naisbitt & P. Aburdene, *Megatrends 2000* (New York: William Morrow & Company, 1990). Nicholas Negroponte, *Being Digital*. (New York: Alfred A. Knopf, 1995). Alvin Toffler, *PowerShift*.

Knowledge, Wealth and Violence at the End of the 20st Century (New York: Bantam Books, 1990). Alvin Toffler, *The Third Wave* (New York: Bantam Books, 1980).

- ³ Jean Baudrillard, *The Ecstasy of Communication* — Semiotext(e). Translated by Bernard and Caroline Schutze (New York: Autonomedia, 1988). Jean Baudrillard, *Simulacra and Simulation*. Translated by Sheila Faria Glaser (An Arbor, MI: The University of Michigan Press, 1994). Mark Taylor & Esa Saarinen, *Imagologies. Media Philosophy* (New York: Routledge, 1994)
- ⁴ Architecture has already suffered an irreversible turn to the digital as electronic media continue to take over traditional analog practices of architecture. Digital technology first replaced drafting, then allowed image processing and rendering, and now permits accurate 3D modeling, animation, interactivity and multimedia. As in previous major technological shifts, the old (i.e., analog) ways of doing things become first literally transplanted into the new, then increasingly challenged, and eventually dropped or transformed beyond recognition. At the end of this process, traditional technologies survive only in those areas where the new technologies cannot outperform them.
- ⁵ Omer Akin & Eleanor F. Weinel, *Representation and Architecture* (Silver Spring, Maryland: Information Dynamics, Inc., 1982)
- ⁶ Wilfred Carr and Stephen Kemmis, *Becoming Critical. Education, Knowledge and Action Research* (Great Britain: Deakin University Press, 1989, p.34)
- ⁷ Academia and architectural firms have been 'wiring' themselves over the last 5 years to the point that they now have enough computer hardware and software (multimedia computers, scanners, printers, intra and inter networks, etc.) and other media support (photocopy machines, CamCorders, VCRs, TVs, telephones, etc.) to technically support an interfacial praxis of architecture.
- ⁸ This is what Rafael Moneo has in mind when he states that "...it is not the architectural schools that follow the trends set by the professional firms, but now it is the professional firms that follow the trends set by the architectural schools." (quoted in Bernard Tschumi,"1, 2, 3, Jump..." *Newsline*, Summer/Sept/Oct., 1994, p.8)
- ⁹ See for example, Nancy Y. Cheng, "By All Means: Multiple Media in Design Education," in B. Colajanni et. al. (eds.), *ECAADE '95 Proceedings* (Dipartimento di Progetto e Costruzione Edilizia, University of Palermo, Italy, 1995). Daniel Herbert, "Models, Scanners, Pencil, and CAD: Iterations between Manual and Digital Media"; in L.Kalisperis & B.Kolarevic (eds): *Proceedings of ACADIA 1995*, pp.21-35. Daniel Herbert, "A Critical Analysis of Design Processes and Media: Applications for Computer-Aided Design"; in A.Harfmann & M.Fraser (eds.): *Proceedings of ACADIA 1994*, pp. 133-146. Ronald Kellett, "Media Matters: Nudging Digital Media into a Manual Design Process (and vice versa)", in *Proceedings of ACADIA 1996*. Bennett Neiman, "The Poetics Potential of Computers: Design and Architecture with the Macintosh," *Focus Symposium on Computers & Innovative Architectural Design: The 7th International Conference on Systems Research, Informatics, and Cybernetics*. (Baden-Baden: Germany, 1994)
- ¹⁰ This proto-theory is laid out in Julio Bermudez & Robert Hermanson, "Tectonics After Virtuality: Returning to the Body," in *Proceedings of the ACSA International Conference* (Copenhagen, Denmark: Royal Academy of Fine Arts School of Architecture, 1996 — in press) (<http://www.arch.utah.edu/tecto.htm>)