

DIAGRAPHICS: AN EXPOSÉ OF VISUAL EXPRESSION

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Abstract

This exposé introduces preparations for a publication based on what I have found to be a 'missing link' in the library of educational source materials. The skills necessary to record and interpret the complexity of the architectural design process are often illusive. The sophistication of computer modeling and graphics applications only adds to the dilemma of making clear and concise decisions about how to communicate the essence of one's design intent. The publication will define and illustrate five Diagraphic models of analysis. Each offers ways of seeing and understanding the idiosyncrasies of recording the design process. Gestures, Traces, Pulls, Morphs and Transits exemplify specific modes of visual expression and integrate both their diagrammatic and graphic nature. The distinctive aspects of each model enable the student of architecture to choose appropriate and meaningful techniques for visual expression. The publication will also illustrate current and historically relevant examples of diagrammatic expression. These examples show how diagrams have been flexible over time in adapting to the needs of newly forming conceptual models, spatial analysis and belief systems.

1. Stating the dilemma – Dualities in the process of design

Do complex sources of information make for complex methods of visualization? This question is at the heart of issues concerning vision and visualization as the tools for design production become increasingly sophisticated. For students of architecture, attempting to translate the sometimes blurry and obscure visions that spring from a mentally constructed formulation into an outwardly legible form *is* complex. The necessity to distill and communicate various forms of abstraction, visual metaphor, design principles and spatio-textual integration requires one to make decisions as to the most articulate means of representing these visions. For many, this can be a mind-bending endeavor.

At its core, there is a dual condition that begs the next question, do we approach design from a purely logical or intellectual stance *and/or* do we use our creativity to offer alternatives, analyze their potential and respond from an intuitive and inspired epiphany? In the academic environment, and specifically in the field of architectural design, we are constantly alternating between these two modes of operation. One moment, students are encouraged to express themselves freely in order to establish a distinctively individual design methodology,

in another; they must communicate their ideas both graphically and verbally so that the inherent logic of the design process is legible and comprehensive. These conditions are evidence of human nature existing in both the creative and intellectual states of being.

Howard Gardner, a PhD in Education Theory at Harvard University, provides a profound distinction between the notions of 'creativity' and 'intellectuality'. In his book, *Creating Minds: An Anatomy of Creativity Seen Through the Lives of Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, and Gandhi*, Gardner states, "The key idea in the psychologist's conception of creativity has been *divergent* thinking. By standard measures intelligent people are thought of as convergers – people who, given some data or a puzzle, can figure out the correct (or at any rate, the conventional) response. In contrast, when given a stimulus or a puzzle, creative people tend to come up with many different associations, at least some of which are idiosyncratic and possibly unique." (Gardner 1993) Thus, in Gardner's view, creativity is found through alternative or '*divergent*' methods of thinking and responding to various clues, information or situations. Intellectuality, on the other hand, is a more singular or '*convergent*' approach to finding specific answers to a set of questions. At any point during the design process there are moments when *divergent* thinking

opens multiple pathways to developing generative and multi-layered constructs. At another, a more linear or *convergent* way of thinking may be necessary to describe one's intentions and formulate the next logical step in a legible and meaningful way. Each student may advance their own design process with ease in one area and less so in the other. As an instructor of architectural design, I must evaluate each student's propensity towards one or the other of these innate tendencies.

By bringing awareness to the notions of *divergent* and *convergent* thinking, each individual is encouraged to tap into their respective modes of expression and question normative or conventional design processes. In doing so, their understanding and appreciation for another "way of seeing" is broadened. Once the lens is filtered to receive a different spectrum of light, never again will they return to what were previously considered to be naïve sensibilities. Of course, it is the nature of the art/design fields to reflect our cultural biases and respond by breaking the molds and creating them anew. By encouraging and enhancing our student's abilities in this regard we will enrich their experience as well as produce potentially thoughtful and thought provoking designers. Another dual condition existing in the education of architects is the diagrammatic evaluation of information vs. its graphic and/or textual description and compositional analysis. The student of design is faced with visualizing quantitative and spatially related information both planar and volumetric and, is required to describe their values, qualities and characteristics with related images and text. Graphs and charts, for example, allow us to visualize non-spatial data volumetrically while isometric and three-dimensional diagrams afford a view of structure, form and materiality.

Diagrammatic modes of representation describe both linear progressions from concept to form and vice versa. The diagram may also construct a set of variables revealing multiple connections and opportunities. The interdependence of two and three-dimensional information and the relationships of text and image are key when demonstrating visual accuracy on the one hand and an openness to interpretation on the other. In this

regard, the graphic expression of the diagram contributes to the comprehension of its metaphorical, aesthetic and/or technical significance.

2. Stating solutions - Integration, synthesis and multiplicity

The need for descriptive methods of visualization that integrate spatial and non-spatial information is crucial in architectural design. With our increasing ability to ingest multiple trajectories of information both in our minds and in its virtual representation I am proposing visualization models that both specify and integrate various conceptions of information. How we develop ideas visually and attempt to represent them spatially is a basic element in the development of the five Diagraphic models I propose. Diagraphics \Di`a*graph`ics\, n. the art or science of descriptive drawing [1913 Webster] The term Diagraphics is used combining the two words, diagram and graphics and has been devised to combine our conceptual and practical abilities - enabling us to 'see' abstract concepts and determine their viability and potential development. Diagrams are typically representations of conceptual, analytical or technical information in a distilled form. They are used to communicate complex sources of information in a simplified and objective format. Graphics are an arrangement of text, image and visual devices composed to communicate a specific message. Various media and compositional techniques are used to give the graphic meaning and content beyond the more direct data-related information of the diagram. Diagraphics define the necessity to establish clear and specific visualization and representation techniques which synthesize the fundamental nature of visual investigations.

2.1. Diagraphics – Five Models

In this portion of the exposé I have catalogued a series of five Diagraphic models. These include: *Gestures*, *Traces*, *Pulls*, *Morphs* and *Transits*. Diagraphic communication represents a process of thinking and working that by nature is cumulative and mutually reciprocal. Hence, the Diagraphics are inclusive and must exact an

appropriate and clear language of image and text when creating visual connections between multiple fields of inquiry. Generalizations must be made in order to establish definitions of each and by comparison, point out the subtleties of distinction between and amongst the methods. The expose links each model to historical and contemporary examples employed by artists and architects over the past two centuries.

Gestures – Intuition and Expression

The Gesture in its purest form is uninterrupted by presuppositions and ‘flows’ freely from the mind through the body to the drawn (or modeled) surface. Gestural sketches may be said to be the most primitive and therefore, intuitive form of visual representation. They emerge from a ‘gut’ reaction, a momentary impulse or response to stimuli. Gestural exercises prompt the student to put aside his/her preconceptions and allow the energy of the imagination to ‘flow’ freely. Santiago Calatrava begins his designs with a series of such sketches. The sketch is a distilled formulation of what Calatrava has *imagined* as he contemplates the initiation of a project. It embodies a complex set of responses to the topographical, climatic and cultural and human environments. For Calatrava, the sketch is an ‘instrument’ that allows him to manifest in two dimensions what will eventually become his ‘sculpture’ (or architecture) and “inspire or bring the essence [to a project].” (Ivy 2000)

Tadao Ando, another architect who often employs the Gesture remarks, “When I draw something, the brain and the hands work together. My hand is the extension of the thinking process—the creative process.” (Ivy 2002) Eric Mendelson’s Einstein’s Tower and Coop Himmelblau’s Roof Renovation are also examples of gestural visualizations that have been transformed into



Figure 1a: L to R—Eric Mendelson’s *Einstein’s Tower*, 1919, Coop Himmelblau’s *Rooftop Renovation* and Santiago Calatrava’s *Secret Sketchbook I*, 1995.

clearly legible architectural space.

Traces – Extraction and Distillation

When tracing, the combined effects of many two-dimensional layers create the palette from which the designer extracts his/her vision. The geometries transcribed on the surface are superimposed creating a complex series of visual opportunities. One can see the juncture or overlay of one object or mark on another as a new form, boundary, or spatial system appears. The information is extracted and distilled from the overlay of surfaces and their combined momentum. Transparency and simultaneity characterize the Trace as one sees multiple images derived from a series of singular moves. Marcel Duchamp in his painting *The Passage from Virgin to Bride*, 1912, uses this technique to imply the transitional spaces and emotional states his subject occupies. Peter Eisenman uses his traces as archeological sites from which he can extract architectural spaces that interrupt and dismantle any opportunity for a static vision. “They also constitute a distinct phase in his architectural practice during which he tested theoretical reflections on the nature of the site, architectural representation, and program with specific drawing techniques involving tracing, superposition, and layering.” (Bedard 1994)

Pulls – Extension and Extrusion

“... in architecture when the grid becomes the plan of a city or a real building, its abstract co-ordinates become literal intersections for the simple extrusion of three-dimensional space. When this happens the secondary or relational aspects of the grid as an index becomes transformed into a primary, direct one-to-one relationship between abstraction and reality, space and



Figure 1b: L to R – Marcel Duchamp’s *The Passage from Virgin to Bride*, 1912, Amedee Ozenfant’s *Still Life*, Kurt Schwitter’s *Merz 163, with Woman Sweating*, 1920, Peter Eisenman’s *Parc de la Villette collage*, 1995 and *Arnoff Center*, 1988-93.

three-dimensional volume, form and function. So most grid-drawn lines in architecture become iconic because of the priority of extruded three-dimensional space." (Eisenman 1995) Here Peter Eisenman is describing the fundamental operation that *pulls* from the two-dimensional abstract concept of the grid, to an "extruded three-dimensional space." In the early 1900's, Suprematist painters and Constructivist architects such as El Lizzitsky, Chernikhov and Melnikov used this method to create a spatial context using platonic geometries. These became a reference or language for "Modern" architecture as the form itself, unadorned and standardized, became the measure for universality and purity. The De Stijl architects, Gerret Rietveld and Van Doesburg extruded walls and building sections as a coded system of flexible construction methods after the industrial revolution. As a way of extending the two dimensional plane into an extruded system of interlocking volumes, John Hedjuk, Peter Eisenman and Bernard Tschumi continue to use the axonometric as the primary device that forms the diagraphic model of the Pull.

Morphs – Manipulation and Transformation

Three dimensional computer modeling applications introduced to students early in their academic careers have greatly influenced the conceptualization of new architectural forms. Specifically, the *surface* of these forms derived from membranes, meshes and maps have become the focus. The *morphing* of the once accepted



Figure 1c: L to R – Iakov Chernikhov, *Fantasy and Construction: I*, c.1920, Konstantin Melnikov's *TRAVIN: Design for the House of Congresses of the USSR*, 1929 and Bernard Tschumi's *Parc de la Villette*, 1982.

platonic form might now be easily manipulated and transformed into infinitely malleable, plastic and fluid surface configurations. In a review of an exhibition entitled *Sign as Surface*, Chris Barker quotes curator

Peter Zellner, and his description of the "communicative significance" of the architectural surface. "Through the architectural surface, these exhibitions draw our attention, once again, to the function of meaning in architecture, to architecture's ability, and perhaps its responsibility, to communicate responsively to contemporary culture. The architectural surface is intimately connected with meaning; simply, we read surfaces, we scan them for content." (Barker 2003)

The Morph as a diagraphic model represents the potential to form an integral language where the ideological and/or conceptual intentions of the work are backed up by its tactile and technical qualities. Frank Gehry worked in the early years of morphological form making and has blazed the trail for the more fantastical conceptions of Peter Zellner, Gregg Lynn and Reiser & Umemoto and others.

Transits – Fluidity, Exchange and Transition

Transits represent visualization methods that are in a constant state of *flux*. Flux is defined as [constant change and instability, to make something fluid, or become fluid.] (Encarta® World English Dictionary 1999) Transits are, therefore, infinite in their approach to engaging multiple fields of inquiry and tie them inextricably to the discourse

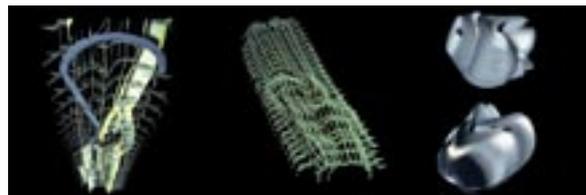


Figure 1d: L to R – Reiser & Umemoto, *Yokohama Port Terminal Competition*, 1995, Gregg Lynn, *Embryologic Space*, 1998.

of architecture. They are about communication across a broad spectrum combining digital and conceptual technologies. Transits are by nature representative of the fluid exchange of information and identity. They challenge our preconceptions and offer newly emerging imagery not yet absorbed, commodified or generalized. The title of Asymptote's book *Flux* which catalogs the work of Lise-Anne Couture and Hani Rashid, is appropriate in describing the state of the Transit. "Rashid and Couture's

work is intriguing because it draws inspiration from a wide range of sources not traditionally associated with architecture - among them the design of airline interiors, sporting equipment, and organic systems like seashells and honeycombs; and various means of communicating and disseminating information. Their projects are concerned as much with light, speed, and traversing virtual boundaries as with "real-world" geometries and building systems." (Archspace.com Book Review 2002) A myriad of other adventurers including firms such as Nox and R&Sie use the diagraphic model of the Transit to question the boundaries of architecture and manifest its wholly transitive potential.

3. Conclusion

We have taken for granted the visualization methods taught in the architectural academy as belonging to a continuum of information. By *naming* the five Diagraphic models, *Gestures*, *Traces*, *Pulls*, *Morphs* and *Transits*, I have suggested the value of offering alternatives for representing and recording aspects of the architectural design process that can be seen and valued in their own



Figure 1e: Top L: Asymptote, *Virtual Museum*, 2001, Top R and Btm: R&Sie's *La Defense - Paris*, date unknown.

right as well as cumulatively. For further validation, they have been categorized and catalogued along with specific historical and contemporary examples. This is a fresh look at visualization methods which until now have not been discussed in these terms. Taking into consideration the individual student's propensity for incorporating the skills necessary for each technique will enable the instructor to guide the student towards using and evolving them in a more satisfying a successful way. In order to share the finding of their success with a broader audience, the Diagraphic models will continue to be tested and documented for eventual publication.

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