WORLD'S GREATEST ARCHITECT

Making, Meaning, and Network Culture

WILLIAM J. MITCHELL

PROLOGUE: MAKING MEANING

For millions of years—ever since our distant ancestors began to fashion simple stone tools—human beings have, simultaneously, been makers of things and makers of meaning.

We are programmed to extract meaning from just about everything. I'm no sociobiologist, but I am convinced by abundant evidence that this is part of our genetic endowment—a capability derived from evolutionary advantage. It is not hard to imagine that the cavemen who survived and reproduced were the ones who could most accurately read the opportunities and threats offered by terrain, weather, and other living creatures.

It was a short step from reading nature—which is utterly indifferent to human needs and purposes—to reading artifacts. And artifacts do have *intentions* behind them. They are made by particular individuals and groups *for* particular purposes, and they often communicate those purposes. Someone might shape a stone to serve as a weapon, and then pick it up to convey a threat—one that is not hard to understand.

In general, then, the artifacts that people produce, circulate, and use play dual roles in daily life. They both serve physical purposes and carry

messages from their makers. We are adept at reading these messages, and the information that we receive in this way guides our actions.

Furthermore, artifacts do not act in isolation. The physical functions of elementary artifacts can be composed to form systems of interrelated parts such as machines, while their meanings can be composed to form more complex expressions such as pictures and works of architecture. For example: mechanical engineers compose mechanisms to produce needed motions; structural engineers compose members to produce frames that transfer loads to the ground; figurative sculptors compose pieces of shaped metal to represent kings and generals; and flower arrangers compose cut blossoms in water-filled vases, according to established conventions, to decorate rooms. The world of artifacts is organized into hierarchies of elements, subsystems, and systems—all of which both serve utilitarian purposes and signify.

From a narrowly focused engineer's perspective, physical functionality is what's important; selecting, shaping, and composing elements and subsystems to produce useful systems is the intellectually engaging game; and the messages carried (perhaps inadvertently) by these compositions are a relatively incidental matter of "aesthetics." It doesn't much matter to the engineer whether a column is Doric, Ionic, Corinthian, or Corbusian so long as it supports the roof.

From a cultural anthropologist's viewpoint, though, physical functionality fades into the background. The roles of artifacts as signs, symbols, and emblems, components of more extended and elaborate symbolic constructions, and transmitters of culture become crucial. Anthropologists, architectural historians, and cultural critics recognize that the need to hold up the roof does not fully determine a column's form— many combinations of material and section modulus would suffice, so the significance of the designer's particular choice of form and materials is what engages their interest.

The most commonplace messages carried by artifacts are announcements, by virtue of resemblance to other things whose functions we know, of what they are for: "This is a handle for opening the door."

Without these sorts of announcements, we would not know what to do with the things we encountered, and we would hardly be able to function ourselves. When door handles are broad and flat, for instance, they announce that they are for pushing, and when they are shaped for comfortable grasping they announce that they are for pulling. When designers choose handle shapes that are ambiguous, or—worse—that send messages that are inconsistent with the way the door actually swings, they create confusion.

To make sure that their announcements of intended use get through, designers often rhetorically heighten them. Thus push bars on doors may be broader and flatter than they really need to be to accommodate the user's palm, while handles for pulling may exaggerate their fit to the contours of grasping and pulling fingers.

Where elements play visible roles in larger systems, designers frequently employ similar rhetoric to show us how these systems work. In a pin-jointed roof truss, for instance, some members will be in tension and others will be in compression. The structural roles of these members become clear, and the way they work together to form a functioning truss becomes legible, if the designer makes the tension members dramatically thinner and the tension members visibly thicker. This principle is carried to a vivid extreme in tensegrity structures, where tension members reduce to wires and compression members become rigid rods.

Designers may also try to convey positive associations, and hence generate desire to acquire and use or inhabit their products, through the devices of metonymy and synecdoche. They often employ natural materials—Carrara marble, Norwegian wood, rich Corinthian leather, and so on—both to provide necessary functionality and to evoke highly regarded places of origin. On college campuses, architects may reuse recognizably classical or medieval architectural elements—either actual relics or modern fakes—to suggest connections to canonical past eras and the continuity of tradition. And product designers are often required to adhere closely to the brand image guidelines of "trusted" corporations—

which is why BMWs are instantly recognizable as BMWs, and Prada bags (real or fake) as Prada bags.

Finally, to conclude this brief and far from exhaustive catalogue, designers may deploy emblems and visual metaphors to refer and allude to other things. Within the language of classical architecture, to take a well-known example, designers can choose from a well-defined lexicon of Tuscan, Doric, Ionic, Corinthian, and Composite columns. Tuscan and Doric are sturdy, while Ionic, Corinthian, and Composite are increasingly slim and elegant. To those who are versed in this language, the thicker, stronger columns carry allusions of masculinity, while the daintier columns are feminine. Even more specifically, by tradition, each column type refers to particular gods and goddesses in the Greek and Roman pantheons. Furthermore, capitals sculpturally represent things—volutes, acanthus leaves, sometimes flowers—that have mythic significance. Selection from among the alternatives, then, is largely governed by considerations of decorum—of producing evocations that are appropriate to a building's context and use. The classical orders might seem lost in the dusty past, but the iconography of, say, fashionable sneakers—in masculine and feminine versions, with carefully constructed references to sports heroes, and powerful conventions of cool and uncool usage—isn't so different.

Not surprisingly, the dual service of artifacts as functional objects and as carriers of messages continually generates difficulties for designers, who have to keep the requirements of both roles in mind. A column may need to be beefed up in order to support the roof, but the rules of the Corinthian order may require it to be slimmer. A sneaker shape may be functional but no longer in style. The old slogan "form follows function" may express a sometime aspiration, but in practice the requirements for efficient functioning and effective communication of a message in a given context are not necessarily the same. Even worse, the syntax that guides composition of physical functions does not necessarily match the syntax structuring composition of meanings. So designers struggle to find ways of reconciling the two, often-conflicting sets of demands.

Even when they succeed in this, their victories may only be temporary, since the functions and meanings they intend may not be the functions and meanings that are subsequently assigned by users. A flat, rectangular wooden slab intended to serve as a door might, for example, be repurposed by some user as a tabletop—one that is emblematic of a casual, bohemian lifestyle. An innocent two-by-four, designed to serve as a structural member, might be picked up and used as a weapon. As Marcel Duchamp realized, a toilet fixture might be removed from its usual context, declared a "fountain," and exhibited in an art gallery. Any relationship that a designer establishes between function and meaning is therefore unstable. Often, as a result, artifacts announce their previous or alternative functions rather than their current ones. Or, under critical reading, they may disclose ironies, tensions, and contradictions in their messages that their originators had been unaware of.

Furthermore, material signifiers, unlike spoken words cannot be chosen freely from a mental stock. They are subject to the exigencies of supply chains, making some of them common and inexpensive in any given context, and others rare and costly; you might want a finely crafted table of solid wood to lend dignity to your dining room, but you might have to settle for a plywood door on trestles from Home Depot.

In the world of physical artifacts, then, functions and meanings are entangled in varied and complex ways. Sometimes designed objects primarily play physical roles, in which case we tend to think of them as engineering components or subsystems. Sometimes they serve mostly to communicate, in which case we tend to think of them as advertisements, fashion statements, art objects, or decoration. Most often, they are complex blends of physical functionality and significance, in which the designer has chosen some tradeoff point between satisfying the requirements of one versus satisfying those of the other.

To reduce the need for making difficult tradeoffs, it helps to have some way of separating physical and symbolic tasks. In other words, we need systems of *abstract*, dematerialized, cost-free artifacts that can serve, in efficiently specialized ways, almost entirely as carriers of messages.

This articulation of tasks resembles the modernist architectural strategy of separating the structural and weatherproofing roles of traditional masonry walls. Load-bearing columns provide structure, while a glass curtain wall provides weatherproofing. The columns can then be optimized for their more specialized, structural purpose, while the curtain walls can serve solely as a transparent, waterproof membranes—allowing them to become vanishingly light and thin.

Robert Venturi's well-known polemical distinction between a restaurant in the form of a duck and one treated as a decorated shed illustrates the point even more clearly. In the ducklike building, the outer shell must serve both as enclosure and as a sign advertising what is to be found inside—Long Island duckling. But it isn't so easy to jam restaurant seating and a kitchen into a supersized duck, not to mention that ducks don't have doors, windows, or loading docks. In the decorated shed, by contrast, the functions of the enclosure and the sign out front are separated, so that each can have the form and materials appropriate to its role. The shed can be shaped pragmatically, in response to the internal space needs. It doesn't have to *say* much. The sign—perhaps showing a painted duck—can be large but inexpensively constructed, prominently located, and vivid. Apart from conveying information, it doesn't have to *do* much.

Spoken language first met the need for a separate, extremely lightweight system of artifacts optimized for communication. You can think of spoken words as transient signs out in front of your face. They enable you, for instance, to shout a threat instead of picking up a stick. They certainly aren't entirely ephemeral—shaped by the physical capabilities of our vocal apparatus, and needing to exist, transiently, as vibrations in the air—but they have proved to be much more convenient and flexible for message transmission purposes than solid objects that must also play other roles. Talk, indeed, is cheap.

Words have also turned out to possess wonderful combinatorial properties. They can be composed in our heads to form infinitely many sentences and narratives. This enables the rapid mental formulation

of ideas and plans—intellectual construction without physically doing. Thus language provides building blocks for thought, and many philosophers have argued that it also shapes or constrains thought—notably Nietzsche, who saw it as an inescapable "prisonhouse."

The residual materiality of spoken-aloud words is not entirely unimportant, though. Sometimes you have to speak up, or slow down, to get your words through to a listener. If you are sensitive to language, you will look for words that not only convey what you want to say, but also sound right. You will think of words both as carriers of information and as physical events that produce more or less pleasurable vibrations of our eardrums. If you are a lyric poet you will go even further, treating the human voice as an instrument and trying to organize words into musiclike sound structures that have internal rhymes, rhythms, and harmonies.

Written language followed the spoken version. Written words have the obvious physical advantages of persisting over time, and of being compactly storable. Written texts can therefore be lengthy, and they can easily transcend the constraints of memory—enabling the routine construction and circulation of complex narratives and arguments. Writing is not just a mechanical process of transcribing thoughts, but also serves for testing and shaping them. Similarly, reading is not simply the sequential input of text to our brains, but is often a subtle, complex process of exploring a text and considering its possible interpretations.

Written and printed words are not completely immaterial either, since they depend upon substrates, marking materials, containers—from file folders to the Library of Congress, and means of physical transportation from place to place. Graphic designers do have to take careful account of material properties, constraints, and costs when they format and produce documents. Still, a crucial benefit of written and printed messages is that they are not unnecessarily weighed down. And, as documents have evolved from inscribed tablets to parchment and eventually laser-printed pages, they have continued to shed bulk and weight.

In the particular case in numbers, it is easy to see how this process of dematerializing signifiers might have worked. According to the story usually offered by archaeologists, numbers and arithmetic began with the practice of keeping uniform physical tokens—shells, or beads, or some such—in heaps or jars to represent collections of other, bigger, heavier things, such as sacks of grain. Arithmetic was then a matter of physically adding and subtracting these tokens. (The modern abacus is a sophisticated descendent of those ancient heaps.) After a while, even lighter, more easily manipulated marks on surfaces—numerals— replaced discrete, three-dimensional tokens. From this beginning, increasingly sophisticated written notation systems evolved.

Origami and paper airplanes aside, sheets of paper exist almost entirely for the purpose of carrying information, so we tend to think of them as neutral substrates. We rarely interpret marks on paper as references to the paper itself. But when we see text, characters, and images on artifacts that serve other purposes, we generally interpret these marks as labels that *do* refer to their carriers. Natural objects do not come with labels, of course, but these days, most physical artifacts do. That is, their designers have chosen to shift part of the burden of communication from the form and materials of the artifact itself to lightweight surface symbols. So, for example, a designer of door handles might not worry about communicating their affordances through their shapes, but might simply inscribe them "push" and "pull."

In the nineteenth century, written language would have seemed to mark the end of the story. But the twentieth century unexpectedly added another chapter. It saw the emergence of electronically encoded messages—first in analog form, and then digital.

Digital information exists electromagnetically, weightlessly (unless you want to consider it at the quantum level), and invisibly. It depends for its usefulness upon devices that encode messages into that form, store them, and then decode them as required—in other words, that dematerialize and then rematerialize them. Programmable output devices such

as computer displays differ dramatically from inscribed and printed arti-
facts since the messages that they present are not fixed, but variable.

This new surface dynamism seems unremarkable on the screens of
laptop computers, which are emblematic products of the digital era and
have never been any other way. But it is more startling when it destabi-
lizes familiar things, such as the facades of buildings. As Times Square
demonstrates, these can now be designed as programmable displays, so
that relationships of the public faces of structures to the activities accom-
modated inside them can change in an instant. If you want to advertise
duck on the menu, you don't even have to paint a sign, now; you can
just display the message for a while.

Electronically processed bits and packets take the dematerialization of
messages about as far as it can go. They cost very little to produce and
process; they can be stored in immense quantities on disks and servers
for practically nothing; they can be copied in an instant with no deg-
radation; and they circulate around the world, in high-bandwidth chan-
nels, at the speed of light. They now fly through the air with the greatest
of ease. The social, economic, and cultural effects of this—as became
evident during the dotcom boom of the nineties—have been profound.
Still, bits do not create a separate realm of cyberspace, as many argued
at that time. They add a new, highly specialized, digital layer to the long-
evolving, intricately interconnected system of physically functioning
artifacts, spoken words, and written words.

Understandably enough, linguists, logicians, and philosophers devote
most of their attention to messages in the abstract. They pay little atten-
tion to the complex interactions of these messages with the physical
functionality of the artifacts that carry them. They tend to dismiss the
additional functions of physically embodied messages, such as news-
papers that serve for swatting flies and lighting fires, as irrelevant to
their concerns. Similarly, literary theorists generally don't much care
whether the texts they study appear on paper or on screen, in hardback
or paperback, large type or small, as long as the messages get through.

For designers, though, it's different. They cannot ignore the specific embodiments of messages in material, potentially useful artifacts, or the potential of physically functioning artifacts also to carry messages.

From a designer's perspective, then, doing things with words is a special case of doing things with things. The limit case of language in its various lightweight and agile forms—spoken, written, and digital—has emerged from a much more solidly material, physically constraining background of artifacts and systems that must accomplish other purposes in addition to communicating.

There is insufficient evidence to support any definitive account of how this happened, but it seems likely that it occurred about 50,000 years ago, at the generally agreed dawn of human culture—perhaps, as Richard Klein has suggested, as the result of a genetic mutation. Human ancestors had made and used primitive stone tools for millions of years before that, and no doubt had communicated by means of simple sounds as well, but at this point they developed systems of artifacts of widely varied forms and functions, and they probably began to speak the sort of rapid, extensive, grammatically structured language that we would recognize as human today. In other words, they created wide ranges of different things suited to different physical and symbolic purposes, and they learned to combine these things—words to construct sentences, blades and hafts to construct axes, and eventually chunks of differently shaped materials to construct buildings.

However we may have arrived at this point, though, the communication systems that we now encounter and use in daily life clearly lie upon a pretty continuous spectrum from the densely and stubbornly material to the flexibly dematerialized, and they all work together. In any setting, there is some division of communication labor among more and less material artifacts, and among more and less physically functional compositions of them. Speaking and writing are specialized ways of making things, just as fabrication and assembly are specialized ways of saying things.

Designing is always a matter of simultaneously crafting the required functionality and the intended messages, subject to physical and economic constraints. Well-designed artifacts succeed on both levels at once. Often, today, they do so by participating in multiple systems of production, circulation, purposing and repurposing, and communication—thus forming complex hybrids, as when manufactured products carry labels and brand marks from the world of written text, and iPods serve as fashion accessories while translating downloaded digital files into audible speech and music or video displays.

Forms, themes, and conventions spawned within particular systems of artifact production, circulation, and interpretation frequently migrate to other systems and take up residence there. Architectural settings are indispensable in films and video games, for example, while film techniques and game engines now structure the presentation of architecture in computer graphics fly-throughs. These boundary crossings may seem obvious when pointed to directly, but the common critical practice of focusing exclusively upon architecture, film, product design, literature, or some other consistent category of artifacts and practices continually obscures them. Mixtures, intersections, adulterations, and contaminations of these "pure" media provide much of the density and complexity that is characteristic of today's cultural settings.

The essays in this book are snapshots, taken over several years in the middle of the first decade of the 2000s, of the now-global operation of these interwoven, inextricably dual-purpose systems of meeting practical needs and communicating by designing, producing, and circulating artifacts of diverse kinds in various combinations and hybrids. They give particular, but not exclusive emphasis to buildings and cities, and to the discourses and product ecosystems that cities support. They continue the investigation initiated in my earlier book *Placing Words*, and they have mostly appeared as regular columns in various journals.