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SPECIAL ISSUE: COMMUNICATION DESIGN FAILURES

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ANTINOMIES OF SEMIOTICS IN GRAPHIC DESIGN

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ABSTRACT

The following paper assesses the roles played by semiotics in graphic design and in graphic design education, which both reflects and shapes practice. It identifies a series of factors; graphic design education methods and culture; semiotic theories themselves and their application to graphic design; the two wings of Peircian semiotics and Saussurian semiology and their incompatibilities; semiology's linguocentrism, its affinity to cultural criticism and its seminal role in cultural and social anthropology, structuralism, poststructuralism and deconstruction. It examines the uses and criticisms of semiotics and semiology in design, their use in graphic design education, and their operationalization within technical communication and human factors as paths that might be applied to graphic design.

INTRODUCTION

This paper reflects an effort to understand semiotics within graphic design and graphic design education and its apparent lack of broad visibility. There are many possible reasons including defects in the theories, difficulty in understanding them or their obscure terminology, difficulty in applying them, or it could be that graphic designers are averse to semiotic theories or theories in general.

The history of semiotics in design indicates that there is no one underlying problem, but a series of antinomies or contradictions. Semiotics is a young field and not well worked out. Semiotic theories have been separated into the two schools of Peirce and Saussure. Saussure's is a theory based on language, not visual or sensory communication. Peirce can be applied to the broad range of communication, but it is difficult to understand, having a strange vocabulary. One might like to combine them, but there are some thorny incompatibilities between them. Peircian semiotics also needs a bridge to graphic design, but there is not the critical mass of people within graphic design to build it, and no one can build it for them. Graphic designers are largely averse to theory and the scholarly publications that could establish and develop a semiotics that would be appropriate to graphic design.

Semiotics and semiology are very much alive and used elsewhere. Semiology was a part of graphic design for much of the last century. It has provided a continuing critical base for social theory, deconstruction and "the interpretive turn" in the humanities. Semiotics is used in technical communication and semiotic concepts are used in human factors to decompose and analyze interpretation. Semiotics can serve as a framework to unify quickly developing but scattered literatures in naturalistic thinking as they are relevant to design. The semiotic model of diagrammatic thinking has made possible a comprehensive understanding not only of diagrams, but the principles behind visual and spatial thinking. It demonstrates the profound importance of graphical communication in the human leap from experiences in the world to the ability to think about those experiences in abstract terms: to make order of what is and imagine what could be (Stjernfeld, 2007).

THE CULTURE OF GRAPHIC DESIGN EDUCATION

Graphic design has a longstanding and close relationship to the visual fine arts and the studio/atelier tradition of instruction by apprenticeship as practiced eighty years ago at the Bauhaus and at the Schüle für Gestaltung Basel, now the Basel School of Design, which until recently functioned as a "vocational level school" (Maier, 1977; Visual Communication Institute, 2009). Vocational and atelier models share a non-intellectual approach to education, in which the knowledge acquired is largely tacit and not available for examination, even by the knower (Polanyi, 1966). As Dietmar Winkler has chronicled, the Bauhaus worked to rationalize formal aspects of design to be more in tune with industrial society, but in their own practice and teaching they were traditional.

> *Hans Meyer in 1928 and Mies van der Rohe in 1930, had been steeped in the trade school tradition, which saw non-applied research and intellectual pursuit as the dilettante activity of the rich and aristocratic. Unfortunately, the Bauhaus faculty did not recognize the restrictions of their own straightjacket. (Winkler, 1997, 131)*

Their design culture also "naively" perpetuated traditional class structure through their pedagogical style and their paternalistic social outlook, which increasingly made them out of touch with the users of their designs.

> *Although the school wanted to be perceived as having a democratic view of society, in fact, it imposed its ideology without consultation with or concern for those who had to live with its experiments (Winkler, 1997, 131).*

The Bauhaus became particularly influential in the US, establishing its distinctive design aesthetics and culture as many of its faculty immigrated to teach at Yale, Illinois Institute of Technology, Harvard and elsewhere.

Graphic design is still sometimes taught outside of academia, in dedicated art schools, as well as in universities. Particularly in the United States, the large majority of graphic design programs are within larger visual fine art departments or schools of art within universities. The design/fine art institutional relationship has steered graphic design education toward the academic fine arts pedagogy and culture, which itself is studio based and non-academic (Storkerson, 2008). Terminal degrees have in design historically been at the Masters or Masters of Fine Arts level. The disparities between MFA and PhD degrees within academia are now being resolved by the necessity that design educators also have PhD degrees (Bonsiepe, 2004, 28). Particularly in the UK, there is a movement toward establishing a "practice based" PhD, which has proven controversial, because it does not conform to accepted standards of scholarly knowledge, which is explicit and discursive, rather than tacit. Advocates of the practice based PhD have argued that scholarship and knowledge should be redefined to accommodate it (Candlin, 2000). A particular issue is tacit knowledge, (Polanyi, 1966; Rust, 2007) which cannot be explicitly expressed or defined. Explicit, discursive knowledge is defined, communicable, open to examination and supports integrated systems of knowledge with breadth and depth. It is not surprising that there is resistance to PhD dissertations in which knowledge is considered contained implicitly within an object.

Fine arts programs have greatest contact with traditional scholarship in art history in art history and aesthetics, both of which are squarely on the humanist and interpretive side of CP Snow's two cultures. Academic fine arts cultures are often both humanist and decidedly anti-science. Here is one educator's reaction not only to semiotics, but to theory in general.

> *Semiotics is academic and abstract. I would venture that for many studio instructors, theory is simply beside the point. Better to discuss successful graphic design or the art canon with students and let them get to work (Crisp, 2004).*

Professional graphic designers are often similarly inclined. Information design is an exception, where user testing, experiments (Frascara, 1997) and benchmarking are used, but not even everyone who practices information design, does so in this way. For example, the American Institute of Graphic Arts' Design for Democracy project was begun after the US election debacle of 2000, where, in a very close presidential election, one of the major factors deciding the election was so-called voter error, in which many voters were unable to decipher confusing ballots. The project aimed at improving ballot design and redesigning of election materials and the graphic standards that specified them (Lausen, 2007). The project leader described the opposing forces within the project as creativity and decoration versus clear communication:

> *What we're trying to do with information design has to do with legibility versus creativity, and it certainly does take creative professionals to create better ballots, but that issues are not [just] decoration (Lausen, 2009).*

The only empirical evidence for the efficacy of the graphic redesigns appeared by chance: I met a fellow at UIC [University of Illinois, Chicago] who was doing [his] PhD on retention elections, and he brought me this diagram and said to me, "…you know you should have this so you can toot your own horn….proof that this redesigned ballot increased participation" (Lausen, 2009).

Presumably, voters had found the older ballots so confusing that they were discouraged from participating, so the new ballots were an improvement on that level, but that does not demonstrate improved voter accuracy, which was the initiating goal. There was no indication of which attributes of the redesign were responsible for the improvement, which were unnecessary and which could still be improved. Under this sort of régime, the client is expected to defer to presumed expertise which is the tacit, proprietary knowledge /talent of the creative professional. How much more effective and persuasive would graphic designers be if they made a habit of testing and measuring to optimize their designs and back-up their claims?

The lack of intellectual preparation among graphic design students and the lack of intellectual content within design programs are well known. In 1969, *Print magazine* published an article evaluating the then current state of design education that began as follows:

> *Students, professionals and educators are convinced that it is time to take a new, hard look at US design schools. What are they doing wrong? What, if anything are they doing right. And is it enough to meet the needs of the 1970s? (Dreyfus, 1969, 18)*

Thus, there has long been, within graphic design and graphic design education, a tension between the desire to develop an intellectual grounding for the field and resistance to doing so. In some senses, cultural criticism has been offered as a substitute, but its critique ends, not with constructive competence. Within graphic design the meanings and methods are not directly defined, but glossed over and treated implicitly as formal decisions that "work better" or "resolve" the design.

SEMIOTICS/SEMIOLOGY

Given the importance of "meaning" to design and to the issues to be addressed here, it is important to clarify what is meant by it. The terms "meaning" and "meaning making" are often used here because they are familiar, but they are not precise. "Signification" and "interpretation" would be more specific, but there is no adequate single term to use. Instead, these terms emphasize different aspects of the same phenomenon. "Signification" emphasizes how things point to other things the way a picture of one's mother points to her, or a broken twig points to someone having recently walked the trail. "Interpretation" emphasizes that the signification is not within the object but the person interpreting: to someone who doesn't know the mother, the picture is about a woman, or middle age, or her hat (Barthes, 1982) and the twig is interpreted by a tracker as an indicator of someone he is to capture or rescue. The term "meaning" is commonly used in language, to refer to significations of words and texts, and of the interpretive possibilities they allow. In its popular use, "meaning" applies to all of these, so it will be used in general, but more precise terms will be used when they are needed.

Designers create meaning by visual, spatial and temporal means. The hope for semiotic theory (semiotics and semiology) has been, as a theory of signification that might connect design moves to the meanings they communicate.

> *Semiotics is the explicit heart of graphic design theory, just as it is the implicit (subconscious) engine in graphic design practice. The central role of semiotics is therefore clear, as, from this perspective, every graphic designer is a semiotician (Skaggs, 1997, 5).*

But sign theory has presented dilemmas. One is its bifurcation into two somewhat incompatible branches: Peirce's semiotics and Saussure's semiology. Semiotics is a general theory of meaning construction based on cognition. It is a philosophical theory of logic that is somewhat difficult to understand and lacks research methods.

> *Charles Sanders Peirce's semiotics is a way of understanding how meaning making, in all of its aspects, works in the mind. It can be applied to all types of communication including behavior, but, it is a philosophical system, not a research tool. "Semiotics provides not a method but a point of view.… Semiotic arises from the attempt to make thematic [the] ground that is common to all methods and sustains them" (Deely, 1990, 10).*

Fernand de Saussure's semiology, in his *Course in General Linguistics* (1920), intended to develop a researchable science of language. It is a theory of language, not related to visual, spatial or temporal aspects of design. The two also use different sign theories, Peirce's three part theory and Saussure's two part theory, so semiology is not merely a subset of semiotics, but a somewhat different formulation.

Peirce

Peirce (1839-1914) was a mathematician, chemist, scientist and a philosopher of analytical bent. He was the founder of modern pragmatism: the view that things are what they do; they are known to people by how they affect people and how people can affect them. In short if something cannot be sensed, and has no detectable effects on the things that can be sensed, there is no way to know it exists. Experience comes about through interaction, and all knowledge is ultimately based in concrete experience. Lakoff and Johnson (1999) demonstrate the ubiquity and necessity of experiential metaphors in language, Gestalt psychology demonstrates basic visual concepts, and Peirce's semiotics argues that this is a fundamental cognitive principle underlying experience and thought.

> *Pragmatism or pragmaticism…was thus Peirce's way of insisting that abstractions must give an account of themselves and must do it in terms of concrete experience (Peirce, 1934, V).*

Experiences and objects, like a tree or a dollar as experienced are representations or mental interpretations, objects not literally as they are, since there are no trees or dollars in the head, but mental objects signified by initial sensory signals and dependent on how the sensory signals are interpreted. Peirce described this semiosis as a three-part relationship of representamen, object and intepretant. The "representamen," also called a "sign vehicle" or "signal" is what comes to the eye. The object or referent is what it is perceived or pointed to, such as "dollar" and the "interpretant," "significance" or "meaning" in the vernacular, is the notion of what a dollar is.

Peirce constructed a taxonomy of signs, starting with symbols, indices and icons. Symbols are "arbitrary signs" in which the form of the sign is not related to its signification and the signification is assigned by convention. A stop sign is a symbol: a set of marks which have been assigned a significance, in this case, "stop here" also signifies. A stop sign can range in size, or even be painted on a wall, as long as its forms are recognizable. Words and street signs are examples of symbols. Indices are indicators—the angle of the sun, the shadows it projects can be used as a clock. A train can be used as a clock if one knows its schedule. These are indices or natural signs. They reflect causal observations such as the movement of shadows. Icons function by having a similarity of resemblance or analogy. In a line chart, the line that rises as it goes to the right is an iconic signification of "rising prices." A religious icon is not a good example, because it is actually a collection of symbols, like the halo, and codes of color, pose, clothing and so forth, which have been assigned or encoded as signals to signify the Virgin Mary.

Natural signs—indices and icons—very often point to cultural meanings, such as getting to work on time, but they are cognitive rather than cultural in the sense that the initial significations are inferred rather than assigned by convention, as when the hour is inferred by the angle of the sun, rather than read from a digital clock. They present the individual as interpreting for him or herself, making use of the environment in a particular context. Recent psychology studies have demonstrated the extent to which iconicities, too, are innately cognitive and not learned through language. For example, Ramachandran (2004, 2006) describes studies in which given two shapes, one "bulbous and amoeboid" and the other like "a jagged piece of glass," and two words for them "kiki" and "booba," that the vast majority of people across different cultures intuitively expect the bulbous shape to be a "booba" and the jagged shape to be a "kiki." This is a cross-modal iconicity linking sight and sound.

> *Look at the kiki and look at the sound kiki. They both share one property, the kiki visual shape has a sharp inflexion and the sound kiki represented in your auditory cortex, in the hearing centres in the brain also has a sharp sudden inflexion of the sound, and the brain performs a cross-modal synesthetic abstraction saying the only thing they have in common is the property of jaggedness. Let me extract that property, that's why they're both kiki" (Ramachandran, 2003).*

Not only that, it is possible to isolate the cognitive architecture behind such "cross modal" iconicity. The abstraction of sharpness takes place in a distinct site in the brain, and if that site is damaged, persons *"cannot do this cross-modal associations even though they're fluent in conversation, they're intelligent, they seem normal in other respects"* (Ramachandran, 2003). Thus, these iconicities do not come from language or culture but wiring, and they are formed intuitively, below consciousness. The appearance of iconicity, here sharpness as an independent third element, demonstrates Peirce's idea that the emergence of a signification as something new and independent, that can be considered in its own right, makes possible the emergence of abstract thought. It is an important finding for anyone who communicates using sensory, experiential modes. Such cognitive and neural studies also hint at how semiotics can be made researchable and useful.

Saussure

Saussure's semiology has been enormously influential in linguistics, philosophy and humanist thought in general including social, cultural and political thought. By concentrating on language systems as primary constituents of cultural meanings, it enabled language to be viewed as the primary source of meaning, rather than just a carrier, and through that, it helped to shape twentieth-century philosophy, hermeneutics, anthropology, sociology, cultural studies and, enabled structuralism, post structuralism, deconstruction and the "linguistic turn."

> *As the medieval philosophers would have it, the way things are (ordo essendi) shapes the way we perceive things (ordo cogitandi) and this gets expressed in the way we speak (ordo loquendi). Especially since the 'linguistic turn' in philosophy and social science, this has been more or less reversed. It is now language, the way we speak, that is considered to shape what things we see and how we see them (Crotty, 1998, 88).*

Saussure's semiology uses a two part model in which a mark, object or sound is a signal that is assigned a meaning, unrelated to its physical attributes. Words are prime examples, except where they are onomatopoetic (Saussure, 1986, 69). While signs are the atoms and molecules of language, it is the language as a system, its grammar and syntax, that dominates and determines their meaning. Barthes calls this system a language, or "langue," "language without speech" (Barthes, 1967, 14), a value system that expresses itself in what can and cannot be said. A language is a "collective contract." Between langue and signs are paroles (words), which are the things that are expressed within the language's sanctioned possibilities.

In short, within semiology reality reflects language. The language is a collective object that encapsulates culture. This primacy of language and the lack of signification as an independent entity, largely bypass cognitive function and the individual as actor. In Peirce's semiotics meaning can be determined by individuals. Within semiology, the emphasis and power to determine meaning are invested in the collective. The differences between Peirce and Saussure reflect the different interests of logicians and linguists, and they also reflect different political cultures. Peirce's semiotics projects an autonomous individual who thinks for him or her self, while in Saussurian semiology power is collective and systemic, and the individual is surrounded by and integral to the culture and its values as operationalized in systems of rules. The history of semiology's association with culture theory and criticism suggests that some of its persuasiveness is derived from its social and political affinities that gave humanities new political relevance (Flyvberg, 2001).

Later developments

The term "semiotic" is often used to cover both semiotics and semiology and to hybridize them in a way that semiotics is invoked to claim a rational grounding, for a semiological content, without fully recognizing the differences between the two models. For example, Umberto Eco (1979) described semiotics and semiology as a division of labor. In his watergate model, Eco described a system for regulating water flow in which a series of lights serve as arbitrary signs indicating the flow and level of water according a code. He demonstrated that given such a code, it is possible to infer meanings outside of those defined by the code. The indexical sign, like the train that is used as a clock, is wrapped around the coded arbitrary signs. Eco uses the same method in reverse order to describe recognizing a cat.

> *Suppose I am crossing a dark street and glimpse an imprecise shape on the sidewalk. Until I recognize it, I will wonder "what is it?" But this '"what is it?" may be (and indeed sometimes is) translated as "what does it mean?" When my attention is better adjusted, and the sensory data have been better evaluated, I finally recognize that it is a cat. I recognize it because I have already seen other cats. Thus I apply to an imprecise field of sensory stimuli the cultural unit «cat». I can even translate the experience into a verbal interpretant (/1 saw a cat/) (Eco, 1979, 165).*

Peirce's model is used in perception as semiosis, seeing the shape as a cat, while once we get to the signification, "cat" is a cultural/ linguistic object, under the purview of semiology and the collective institution of language. This combining created a host of confusions and contradictions, as noted by Tomas Maldonado (1970, 119-123). More recently, Skaggs and Shank (1997) began work on a more useful, analytical approach to integrating semiotics and semiology for design purposes.

Semiology presents obvious difficulties for graphic design as it lacks sensory dimensions, while images have distinct organizational characteristics, they do not correspond to the formal, systematic, syntactic structures of language, but to the visual and spatial aspects of experience. Moreover designers depend on intuitive, unconscious levels of reception, in addition to learned languages. Organizational devices (location, separation, contrast, clustering, openness, containment, etc.) for example, may be formulated as conventions, but are also rooted in cognition, as described by Gestalt theory (Wertheimer, 1923/1958; Koffka, 1935). In many respects, then, what distinguishes design as a field is its use of natural, experiential signs in addition to conventional ones to communicate and associate experience and concept. This has been particularly obvious in the design influenced by the Bauhaus, Ulm and Swiss modern designers, who have focused on abstraction, rather than descriptive illustration.

INFLUENCES OF SEMIOLOGY AND SEMIOTICS

Despite its linguocentrism, semiology was highly influential in twentieth-century design and became integral to the graphic designer's identity as it was applied metaphorically to graphic design. In 1986, Abraham Moles summed this up, he described the graphic designer as one who gives "legibility" to an artificial, man-created world, in which the natural relationships of human to environment have to be deliberately created, which is to say engineered.

> *Thus, we can anticipate the promotion of the role played by the graphic designer, into that of a sign engineer who precisely designates the symbolic aspects of the environment to prepare us for real actions. It is this application to the universe of that general principle of graphic design which allows us to achieve correspondence of the world of signs with personal lifestyle—to connect the symbolic aspects of successive landscapes or ideoscenarios, which form part of each individual's vital trajectory toward a temporary destination within the project pursued (Moles, 1986, 44).*

Within the artificial but "real" spaces of the human built environment and the virtual spaces of the page, the designer is charged with *"assembling signs into symbols and…symbols into space [to create] an ecology of signs"* (Moles, 1986, 45). In this artificial environment, the designer engineers information, propaganda, social consciousness, consonance of actions with goals and an autodidactic function, though *"the graphic designer is not responsible for the content of a message, which is always imposed by others, but, rather, for a style and its social consequences"* (Moles, 1986, 47).

The influence of semiology and semiotics can be seen in a number of areas:

- Application of "language" and linguistic concepts to visual communications; the use of rhetorical tropes within visual communication.
- Application of linguistic concepts to systematize the construction of sign systems and visual languages.
- Iconicity in logotype and symbol design: based not on object-to-object resemblance, but on semantic iconicity, which is often cross-modal.

Some of the influences were direct, as, for example, Moles, Bonsiepe, Maldonado and other colleagues at the Ulm School of Design, in the 1960s, were investigating semiotic theories and working to apply discursive knowledge to design. But, many graphic designers seem to have had little or no interest in theory per se, so semiotic or semiological ideas influenced them indirectly as the ideas were popularized and gained prominence in the social culture, and as designers observed each other's work. Used metaphorically these ideas could point at what could be done, leaving the designer to resolve how to do it by familiar methods.

Modernist design

In the twentieth century, first in Europe, then in America, graphic design turned away from illustration, to a more abstract method of communication. As an ideal type, within illustration, a class or concept is signified by a member, drawn in such a way that many individual aspects are taken as unimportant (summer is a sun bather on the sand), while in design the tendency has been to indicate the concept or class without reference to individuals (summer as bright yellow, blue and white). Exercises of the latter sort have been a staple of foundation studies in graphic design (Maier, 1977, 323-354). It was applied to abstract forms such as logos, in which the sign is iconic, not as a pictogram, resembling its referent, but by embodying largely semantic characteristics that the viewer will impute to the referent. For example, Frutiger describes his AP logo for the Aeroport of Paris as follows:

> *The main image is…that of the initials AP. In deciding the choice, the legibility of the letters is the main argument. The shape of the A recalls the protective roof of a house, but at the same time an arrow pointing taking flight. P for Paris is like an abbreviated recollection of the town (Frutiger, 1980, 100).*

The semantic suggestions of protection and taking flight is an oblique method of communication, in which the initials "AP" are a conventional sign or symbol signifying Aeroport Paris as its referent or object, while the semantic inflections of form iconically signify an interpretant, so that Aeroport Paris, signifies safety and flight. While this mode of communication was based on notions of semiotics and semiology, it also remained firmly within the aesthetic practice of graphic design and could be approached by the designer in a non-theoretical way.

SIGN SYSTEMS AND VISUAL LANGUAGES

The development of visual sign systems was encouraged by internationalization, and the increasing use of technological systems, leading to the need for standardized visual sign systems. Martin Krampen (1965) traces road-warning signs to 1909 (well before Saussure's semiology) and four pictographic signs that were adopted at an international congress in Paris.

Otto Neurath's Isotype, designed by Gerd Arntz and Erwin Bernath, is the first well known modern example of a language based on pictograms. Neurath was a member of the Vienna Circle of positivist philosophers who had some contact with semiotician Charles Morris (1938), but Isotype was designed without the apparent influence of sign theory. It was not designed as a "visual language" so much as a specialized tool for communicating propaganda: to educate populations about their societies. According to Marie Neurath:

> *From the very beginning it was clear to Otto Neurath that what he wanted to create and introduce was not a new international language of the type of the Chinese script, but an educational tool to make selective statements. He did not want to get rid of the usual printed text, but wanted an auxiliary tool for better communication (Neurath, 1974, 145-146).*

The visual aspects of Isotype reflect the influences of German expressionism, constructivism and socialist realism rather than semiotics or semiology. The pictograms were simplified characterizations of social roles and situations rather than visualizations of concepts, and they were brought together in images that make brief narratives, such as a doctor taking notes, sitting across from a patient. Its language was editorial and expressive rather than cool.

Other systems were influenced by semiology, both directly and indirectly, as it provided tools for the development of systems of arbitrary and quasi-arbitrary signs or "glyphs" which became an increasing focus of graphic design up to the 1970s. These included both historical studies of glyphs (e.g., Frutiger, 1978/1989) and the systems of symbols used for purposes ranging from road warnings to wayfinding, and signs for specific areas of activity such as agriculture, religion and home economics (Dreyfus, 1984). The November-December 1969 issue of Print magazine was devoted to international signs and symbols, as a major initiative of ICOGRADA, the International Council of Graphic Design Associations. It included an article by Margaret Mead (1969) on the anthropological considerations of international glyphs or symbols, pointing out that there were no universal symbols, then offering a taxonomy of glyphs, their limitations in comparison to languages, and ways in which glyphic systems can be built.

Figure 1
International road signs

The glyphic systems designers created, whether arbitrary or quasi-pictographic, also made use of Saussurian notions of grammar, and of phonemes (fundamental units of sound) and morphemes (fundamental units of meaning such as root, prefix and suffix), by using strokes and simple forms in an analogous way. Compared to Isotype, these systems are more language like. Their forms tend to be visualizations of concepts rather than abstracted characterizations, they are cool and informative, largely without editorial content, and where needed, there were systematic ways to combine signs. The language LoCos, invented by Yukio Ota in 1964, for example, uses a dot to indicate now, a dot followed by a dash to indicate the past and a dash followed by a dot to indicate future. It uses a circle open at the top to indicate a man, which, with a dot in its center, means "me," with an airplane or envelope inscribed becomes pilot or mailman (http://www.tamabi.ac.jp/Soumu/gai/hojo/seika/2002/kyoudou-ota.pdf). LoCos is currently being investigated as a possible visual language for cell phone "texting" (Marcus, 2007).

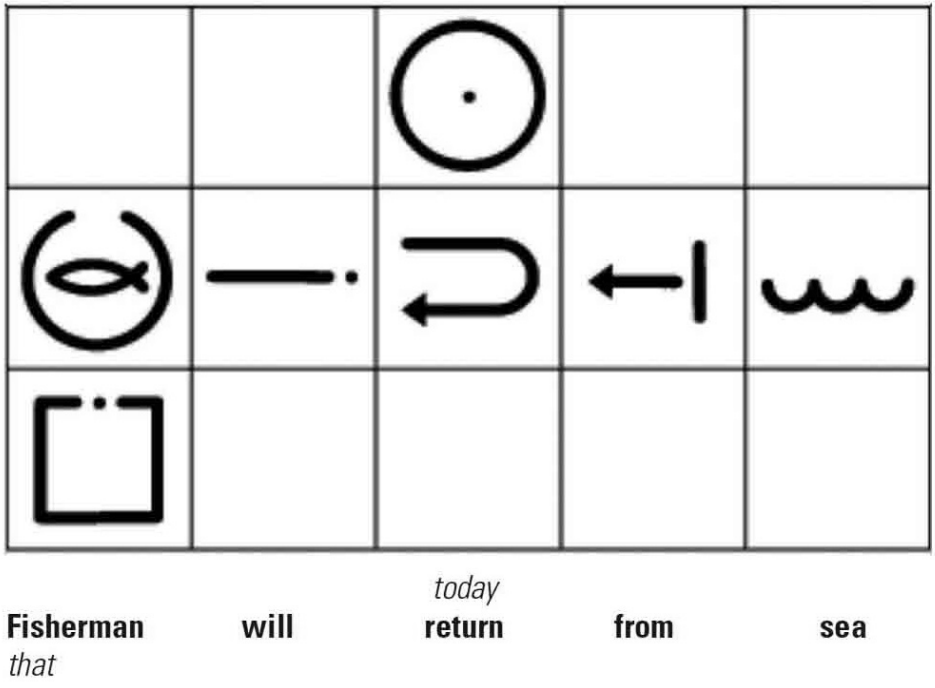

Figure 2
LoCos: That fisherman will return today from the sea.

Sign theory is also credited with the development of the notion of "visual rhetoric," the application of rhetorical principles and tropes with origins in oral to visual representation. At HfG Ulm, Bonsiepe (1965) systematically analyzed visual semantics and rhetoric, particularly in advertising (Ulm, 14/15/16). His rhetorical figures included visual/verbal comparison ("sharp ideas" depicted by sharp pencils), visual/verbal analogy ("refueling" depicted by hummingbird feeding on a flower), visual/verbal metonymy ("precise" depicted as a caliper measuring the globe), verbal specification (image with title), visual substitution (computer "greedy collar" depicted as a punch card curved and folded to resemble a collar), visual/verbal parallelism (abundance of air indicated by an area of light gray) and associative mediation ("Take a holiday from everyday drinks!" with sunset and a calm sea viewed through a porthole).

While Bonsiepe's examples were largely of text-image juxtapositions, Hanno Ehses demonstrated the use of rhetoric as a teaching method to generate graphic images (Ehses, 1984). Students could be assigned to utilize different tropes to produce a variety of solutions. A series of student posters on Shakespeare's Macbeth show different tropes: metaphor (a lion-like rendering of Macbeth's face), antithesis (Macbeth's face and crown split in half to show loyalty and malignancy), irony (Macbeth and Lady Macbeth as stylish and "amiable"), personification (bleeding armor), metonymy (crown and blood for king and carnage), synecdoche (eyes for man), periphrases (the baited trap facing Macbeth), pun (three witches pictured on the diadem of his crown), and hyperbole (a tiny king staggering under the weight of a huge crown) .

A recurrent theme in the examples from pictograms to artificial languages and visual rhetoric is the catalytic role of sign theory in creating or promoting ways of approaching communication. Once those ways of approaching communication are established, they can develop independent of the underlying theory. For example, while classical rhetoric is based on oratory, an instructor needs only to present the tropes and examples to demonstrate their meaning. As visual rhetoric itself demonstrates, the tropes reflect underlying cross-modal iconicities that can link language with image. Similarly, the application of linguistic terms such as phoneme and morpheme to graphic gestures of stroke and shape, can be fit into a logical puzzling out of how to modularize the construction of abstract signs and languages.

In 1979, Thomas Ockerse and Hans van Dijk described a system of instruction based on Peirce, in use at the Rhode Island School of Design (Ockerse, 1979). It decomposed sign production into the Peircian triad of sign vehicle, object and interpretant (significance) and the larger categories of syntactics or grammar of form (e.g., gestalt principles), semantics (representation of object and interpretant) and pragmatics (the relation to user and sender). Ockerse and van Dijk, described a number of exercises in which these variables were discretely manipulated.

> *Some of the projects deal with equivalencies at the structural or semantical level as influenced by processes of substitution. In other projects, contextual manipulation determined degrees of significance. Some projects (such as the score) mainly concerned with sign-object relations and rules of logical formation in the end become supersigns [with multiple simultaneous interpretants] (Ockerse and van Dijk, 1979, 363).*

The approach taken by Ockerse and van Dijk is explicit in its integration of semiotic concepts and principles into the making of graphic objects ranging from pictographic and abstract wayfinding signs to word-image communications and visual scores representing complex sequences or actions. This method, like that of Hanno Ehses, attempts to link the tacit knowledge of making with discursive metaknowledge, to enlarge the designer's creative scope. The Ockerse-van Dijk method, further locates the discursive knowledge in a general framework that is relevant to graphic design as a whole.

In the methods of Ehses and Ockerse-van Dijk, explicit concepts are used in the content of instruction to link tacit knowledge to discursive knowledge, developing the designer's ability to conceptualize and to apply concepts across media and modes of communication. These are just examples. There have been and there are certainly others working in this area. It is not possible to know how many, because design educators do not generally publish their syllabi and teaching techniques. That reticence does not bode well for the transmission of such pedagogy. It is more consistent with the loss of content over time as past exercises are repeated while the pedagogical content is forgotten.

RECEPTION OF THEORIES

Whatever influence semiotics and semiology have had in practice, they have been viewed as problematical theories for design. In contrast to the Bauhaus, the faculty of the HfG Ulm took a strong interest in theory and the application of knowledge to design but they were also aware of the limits of rationalization. They looked for a middle road:

> *Hence, on the one hand, the Ulm methodology – or what is considered to be the Ulm methodology – has given rise to a resistance which even reinforces the romantic attitude towards design. On the other hand, it has brought about an altogether indiscriminate, and often unfounded hope in design under the scientific aegis" (Maldonado and Bonsiepe, 1964, 11).*

They looked within discursive knowledge for new ways to think and stressed that techniques should be seen pragmatically, according to "their instrumental value." (19). Klauss Krippendorff called this "science for design" (Krippendorff, 2006, 73-74) Distinct from science of design or design science, science for design operates within practice as a way to creatively make use of knowledge.

Maldonado and Krippendorff, both criticized semiotics in a number of ways. Maldonado argued that:

> *The attempt to make use of a semiotic set of ideas to describe communicative (and even aesthetic) phenomena in the fields of architecture, urbanistics, and "industrial design" have not yielded the results that many expected, for many reasons, but above all for the lack of maturity in the semiotic itself" (Maldonado, 1970/1972, 119).*

This "lack of maturity" was reflected in the semiotics-semiology split and the differing interpretations of Peirce by later theorists, but particularly, the problem of operationally applying semiotics:

> *The semiotics (or the semiology) of architecture still remains at the metaphorical level. It would seem that, up to now, all efforts have been directed exclusively toward a substitution of the terminology of another, and little more (Maldonado, 1970/1972, 123).*

In Britain, Robin Kinross argued on traditional grounds that the theorist or critic's formulation of ideas is fundamentally different from the designer's making of images: *"Theory becomes manifest in books and journals, in lecture and seminar rooms—and splits off from the practice of the design office or workshop"* (Kinross, 1986, 192). Kinross criticized semiotics on a number of counts: that semiotics is a method of critique rather than construction; that semiotics does not offer new insights; that language based analysis is inappropriate to images because they do not have structures parallel to language; that it reduces objects to mere signs.

> *Physical objects, whose meanings the semiotician lays claim to, have a substance and a presence that discussion limited to 'significance' and 'structure' (mental, abstract structure) cannot begin to touch (Kinross, 1986, 195).*

However one could respond to any of these criticisms—as valid or misguided—they reflect semiotics and semiology as they developed and as they were regarded: the muddle of semiotics and semiology and semiology's tendency to reduce everything to language, as well as the tendency in graphic design to divorce theory from practice.

USES OF SEMIOTICS OUTSIDE OF DESIGN

While within design (with few exceptions) semiotics was usable only metaphorically, it has been directly applied in technical communication. While design is covalent with the visual fine arts, technical communication bonds with information. Its practitioners do not think about their works as "physical objects" or artifacts, but as methods for communication. Technical communication also has a more clearly delineated understanding of communicative goals and tools, so that performance characteristics and communicative goals can be directly related to graphic design choices.

Technical communication

Manning and Amare (2006) approach communication through Peirce's three pragmatic categories: decoratives, (an unfortunate term) which evoke feelings, indicatives which direct receivers in some way and informatives which enable understanding. Decoratives would include semantic values of presentation such as color or type style. Indicatives include bullets or arrows: "Bulleted lists, for example, specifically move an audience to the actions of separating,

dividing, and contrasting otherwise undivided statements in the flow of information" (Manning and Amare, 2006, 195). Informatives promote understanding by the presentation of information such that its significance can be understood.

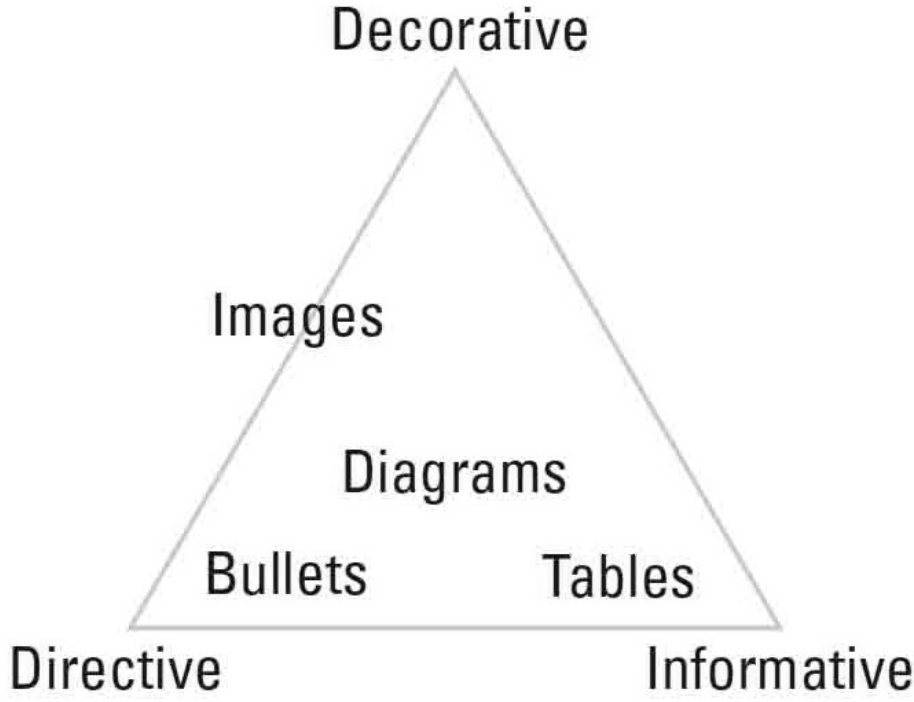

Figure 3
Decoratives, directives, informatives (after Manning and Amare)

Visuals can be classified according to this taxonomy. Images are on an axis with directives (pointing at what they show) at one end and decoratives (evoking emotions) at the other. Icons, such as, diagrams, charts and tables can be placed in the field according to an orthogonal axis with image at one end and informative language at the other, tables being the most language like. Images "lack 1) clear contrasts, 2) filters for detail and 3) reliable generalizations" while diagrams, which are closer to informative language provide all of these.

Ethics represents operationalization, that is, the relationships between specific choices of means (whether to use an image, diagram or text) and goals (how a communication is understood). The authors invoke Peirce's concept of ethics as deliberate action with respect to a goal.

> *Ethics is the study of what ends of action we are deliberately prepared to adopt. That is right action which is in conformity to ends which we are prepared deliberately to adopt (Peirce, 1933).*

The technical communicator has ethical obligations to the audience to provide *"truthful and accurate communications"* (STC, 1998). This requires a *"correct identification of communicative goals shared by presenter and audience alike"* (STC, 1998, 197).

> *Technical communicators are ethically obliged to be aware of which information-design strategies are effective and which are not, and under what circumstances (STC, 1998, 207)* and *Those who use cluttered and complicated graphics simply because they like cluttered and complicated graphics may commit an ethical breach… if their goal to satisfy themselves does not take into account the audience goal of complete understanding.*

Honest communication requires that decoratives, indicatives and informatives be controlled to promote comprehension, representing the informational content and directing the audience toward that content rather than away from it. "No visual is inherently ethical or nonethical. Rhetorical ethics is always determined in matching the authorial goals to audience goals" (STC, 1998, 208).

This example illustrates both how Peirce's semiotics can be applied to the design of graphics, and how the application of theory can clarify a field in ways that are useful in both practice and instruction. Such analytical tools would be very helpful to designers in enabling them, on a project-by-project basis, to better specify their goals and the methods.

Semiotics as a framework for research in psychology: the lens model

Finally, Peircian semiotics can serve as a framework within which to make use of cognitive research for design purposes. There is an increasing literature in psychology on experiential thinking, which does not have a good framework in psychology to make it usable. Egon Brunswik's lens theory shows a way to analyze interpretation that fits well within a semiotic frame and can link it to the construction of designs. It does not provide a set of rules for how to design, but supports research that can provide knowledge that is applicable to graphic construction.

Brunswik's frame is pragmatic. The organism (a human or any other creature that acts in the world) seeks to act appropriately with the environment for the furtherance of its goals (Tolman, 1951, 13). This is the objective level at which the organism succeeds or fails—it stops at the cliff or falls off. To succeed and survive, it needs an internal representation of its environment that functionally corresponds to that environment. The organism's cognitive job is to use "proximate" sensory information as indices, signifying objects and events comprising the "distal" environment to make that environment predictable. This is difficult in natural environments, because a cause in the environment can have a number of effects and an effect can have had any of many causes. The organism receives sensory information in different modes (sight, sound, touch) and from different organs (eyes, ears, skin). There is often redundancy between sensory inputs (seeing and hearing the hammer hit the nail) and the organism integrates and weighs those various indicators in order to come up with a reliable picture of what is happening to what. Put simply, by weighing many sensory signals, any of which can be in error, a very high degree of reliability is possible. People rely on their senses to perceive their environments, and their senses are generally highly reliable.

Brunswik' crystalized this approach in his "lens model" of perception, below. It models the functional correspondence between the environment and the organism's representation of the environment. The initial focal variable, which is the distal object, is available to the organism through a series of mediating sensory signals or signs, which Brunswik calls "cues" along with spurious noise and errors. The organism's achievement of a "stable relationship" or functional correspondence of the terminal focal variable with respect to the environment, is effected through "vicarious processing," in which the organism decides which signals to pay attention to and what they signify. What this means is that we human beings, for example, do not actually experience the proximal light on our retinas (the initial focal variable). We see the distal scene

of objects around us (final focal variable), and we see them as the same objects ("stable relationship") under widely differing conditions of light, distance and angle. This is an achievement of perceptual interpretation, in which many different "cues" are weighed, so that we spontaneously see the clock on a distant church tower as bigger than the alarm clock on the night table next to us.

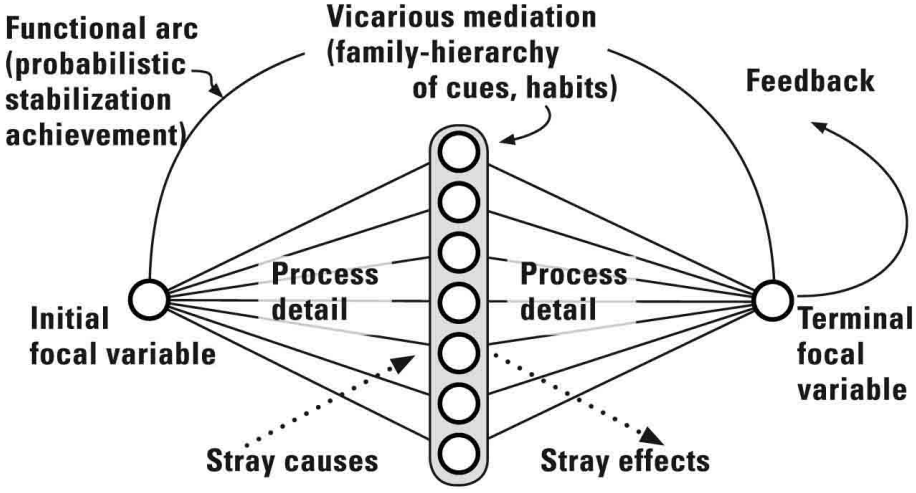

Figure 4
The Lens model: composite picture of the functional unit of behavior.
In E. Brunswik's The Conceptual Framework of Psychology 1952, 20.
© 1952, University of Chicago Press. Adapted with permission.

The lens model can be scaled, elaborated and extended for situations of varying complexity, and for action as well as perception. It addresses how humans process proximal signs, to make judgments about the distal environment. It analyzes how judgments functions in practice, in ways that are helpful to designers.

Application of the lens model

Stewart and Lusk (1990) adapted and applied the lens model in an experiment studying judgment in weather forecasting of microbursts, rapidly occurring strong downdrafts, that pose a serious threat to aviation.

The lens model shows the phases of forecasting. The experiment concerns phases C through F, that involve forecasters. At each step there are judgments in which what is presented is interpreted, and that interpretation serves as a sign or "cue" for the next step:

A) Visual signals from the displays that are meant as cues to signify the data that signifies the current state of the weather.
B) The forecaster's perception of the displays is what the forecaster takes visual signals to signify.
C) The forecaster must "vicariously process" his or her interpretation of what the displays signify as cues indicating "precursor cues," that are predictive of a developing microburst.
D) The forecaster processes the precursor cues in making a final prediction of the likelihood of a microburst.

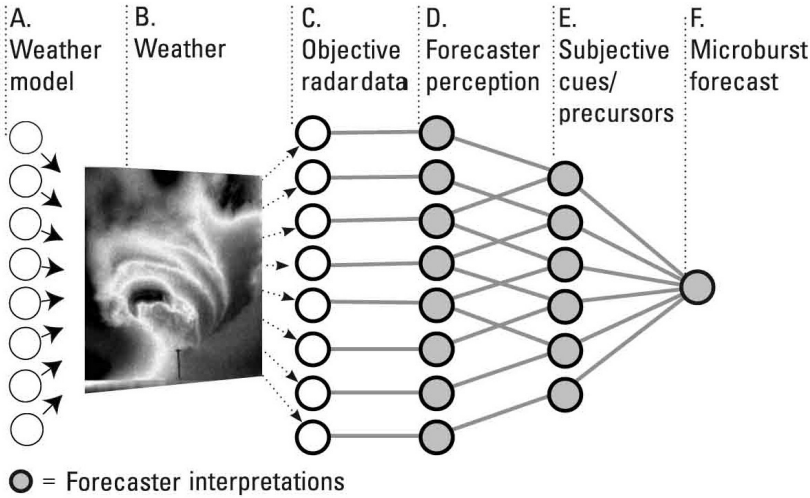

Figure 5
5 Sequence of phases in microburst forecasting. In Lusk et al. Judgment and Decision Making in Dynamic Tasks: The Case of Forecasting the Microburst. © 1990, American Meterological Society.

There can be problems at each step.

C) The visual signals may show incorrect or out of date data.

D) The forecaster may not be able to see the screens properly or may misread them because they are illegible or ambiguous.

E) The forecaster may interpret cues differently especially when making a qualitative interpretation, based on quantitative information.

F) The interpretation of "precursor cues" to make the final prediction are affected by all the previous steps, and the forecaster's vicarious processing of all of the precursor cues.

This processing reflects forecaster variables (e.g., bias toward predicting a high or low likelihood) of a microburst.

Thus, from the standpoint of the forecasters, the process can be decomposed into three sets of interpretations, each involving vicarious processing of sensory input (signs) and or judgments based on those inputs to interpret a remote distal environment. At each step, signs can be experimentally changed so that the vicarious processing can be detected as the relative weight and significance assigned to cues in different situations. Forecasters can be compared as indicators of different training methods and other human variables. Using historical data, it would be possible to measure the actual throughput accuracy of the forecasting including the theoretical weather model and methods of measurement, corresponding to the "objective" level of forecast-environment correspondence.

CONCLUSION

This paper has outlined issues in the relationships between semiology, semiotics and graphic design that have affected the use and usefulness of semiotics and semiology within graphic design. There is no simple way to account for or evaluate the current low visibility and application of semiotics and semiology within graphic design.

Semiology in particular has been highly influential directly, through its concepts, and indirectly through its effects on culture including structuralism, post structuralism and critical theory. In design that influence seems to have waned, as early hopes for visual languages were unfulfilled, pictographic and quasi arbitrary sign systems became established and routine, as modernist universalism gave way to postmodern interest in cultural difference and as abstracted forms such as logos lost some of their stylishness.

There are significant theoretical problems within semiotics and semiology that are indicative of the youth of the field. These include two quasi-compatible schools, difficulties in understanding semiotics in particular and numerous differences among theorists as noted by Maldonado (1970/72). Peircian semiotics, in particular was written as a philosophical frame for understanding, which needs middle range theories and methodologies to make it applicable in a generative way.

Semiotics and semiology are used in other fields and there are design educators who have applied them pedagogically, but the cultures of graphic design practice and education are themselves barriers to the understanding, acceptance and development of a semiotics that is useful to design. When a field truly assimilates knowledge, it develops its own theoretical and methodological expressions to create knowledge that is apposite to it. Graphic design has shown a willingness to borrow knowledge from other fields such as Gestalt psychology, but it has not shown an interest in developing such knowledge into generative tools for graphic design.

Technical communication demonstrates how Peirce's thinking on the level of the pragmatics of communication can be used to create tools for analyzing both goals and methods. It enables that field to better specify its goals and develop generative, knowledge-based guidelines regarding what methods to use. It achieves a level of clarity that one does not find in graphic design, where the problems may be more complicated, but need not be ill defined.

Brunswik's lens model provides an empirical research method for studying signs, objects and significations as they operate within the everyday, natural and pragmatic interaction of human experience and judgment. It provides not guidelines for design, but tools for research into the many variables that affect the ability to make interpretations and the interpretations that are made. While various theories, structuralist or otherwise, make claims as to what interpretations should be made, empirical studies can investigate what interpretations are made and why they serve as a basis for designs.

As Bonsiepe noted, there has been an "uneasy relationship between design and design research" (Bonsiepe, 2008). Bonsiepe described the fundamental dilemma that while design is not science, it needs science. "We can hardly get to the roots of design using art-theoretical concepts. Design is an independent category" (Bonsiepe, 2008, 31). This is a serious problem for graphic design and graphic design education. Given its history, one is not sanguine about the future. As a practical matter, graphic design can probably continue for some time as it is, but with its scope and creativity increasingly circumscribed, as the field of communication grows and new areas of communication are occupied by others—it is at risk. Particularly where information is visualized, computer interaction is involved or where clients are outside of the range of typical design clients, human factors and human computer interaction are able to apply a broad set of methodologies (including Brunswik's lens theory) that enable them to parse communication problems, design and evaluate solutions and demonstrate the value of their work in ways that are beyond the dreams of graphic designers. This is an opportunity for those who are willing to address it.

REFERENCES

Barthes, R. 1964. *Elements of Semiology*. New York, NY: Hill and Wang.

Bonsiepe, G. 1965. Visual/verbal rhetoric. *Ulm,* 14/15/16, 23-40.

Bonsiepe, G. 2008. The uneasy relationship between Design and Design Research. In Mitchel, R. *Design Research Now*. Basel, SW: Birkhauser,: Springer, 25-39

Brunswik, E. 1952. *The Conceptual Framework of Psychology.* Chicago, IL: University of Chicago Press.

Candlin, F. 2000. Practice-based Doctorates and Questions of Academic Legitimacy. *International Journal of Art and Design Education,* 19.1, 96-101.

Crisp, D. 2004. Book review of visible signs: an introduction to semiotics and the fundamentals of creative design. *Print,* 58.2, 34.

Crotty, M. 1998. *The Foundations of Social Research: meaning and perspective in the research process.* Thousand Oaks, CA: Sage Publications.

Deely, J. 1990. *Basics of Semiotics.* Bloomington, IN: University of Indiana Press.

Dreyfus, P. 1969. Design education today: turmoil and transition. *Print,* 23.5.

Dreyfus, H. 1984. *Symbol Sourcebook*. New York, NY: Van Nostrand Reinhold.

Eco, U. 1979. *A Theory of Semiotics.* Bloomington, IN: Indiana University Press.

Ehses, H. 1984. Representing Macbeth: a case study in visual rhetoric. *Design Issues,* 1.1, 53-63.

Flyvberg, B. 2001. *Making social science matter: why social inquiry fails and how it can succeed again.* Cambridge, UK: Cambridge University Press.

Frascara, J. 1997. *User-centered Graphic Design: mass communications and social change.* London: Taylor and Francis.

Frutiger, A. 1978/1989. *Signs and Symbols: their design and meaning.* London: Studio Editions.

Frutiger, A. 1980. *Type Sign Symbol.* Zurich: Editions ABC.

Kinross, R. 1986. Semiotics and designing. *Information design journal,* 4.3, 190-198.

Koffka, K. 1935. *Principles of Gestalt Psychology.* New York, NY: Harcourt, Brace and World.

Krampen, M. 1965. Symbols in graphic communication. *Design Quarterly,* 62, 1-31.

Krippendorff, K. 2006. The *Semantic Turn: a new foundation for design.* London, UK: Taylor and Francis.

Lakoff, G. and M. Johnson. 1999. *Philosophy in the Flesh.* New York, NY: Basic Books.

Lausen, M. 2007. *Design for democracy: ballot and election design.* Chicago, IL: University of Chicago Press.

Lausen, M. 2009. Designing Change. *Design Matters.* Urbana, IL: University of Illinois, (Accessed June 24, 2009) http://designmatters.art.uiuc.edu/Videos/marcia-lausen-2/

Lusk, C. 1990. In Judgment and Decision Making in Dynamic Tasks: The Case of Forecasting the Microburst. *Weather and Forecasting,* 5.4.

Maier, M. 1977. *Basic design principles: the foundation program at the School of Design, Basel.* New York, NY: Van Nostrand Reinhold Publishers.

Maldonado, T. 1970/1972. *Nature, design and revolution: toward a critical ecology.* New York, NY: Harper and Row, Publishers.

Maldonado, T. and G. Bonsiepe. 1965. Science and Design. *ULM,* 10/11, 10-16.

Manning, A. and N. Amare. 2006. Visual-rhetoric ethics: beyond accuracy and injury. *Technical communications,* 53.2, 195-211.

Marcus, A. 2007. m-LoCos UI: a universal visible language for global mobile communication. In Jako, J., editor. *Human-computer interaction,* Part III, HCII 2007, LNCS 4552. Berlin: Springer, 144-153.

Mead, M. 1969. Anthropology and Glyphs. *Print,* 23.6, 50-53.

Moles, A. 1986. The legibility of the world: a project of graphic design. *Design Issues,* 3.1, 43-53.

Morris, C. 1938. *Foundations of the Theory of Signs.* Chicago, IL: University of Chicago Press.

Neurath, M. 1974. Isotype. *Instructional science,* 3.2, 127-150.

Neurath, O. 1937. *BASIC by Isotype.* London: Kegan Paul, Trench, Trubner & Co.

Ockerse, T. and H. van Dijk. 1979. Semiotics and graphic design education. *Visible Language,* 13.4, 358-78.

Peirce, C. 1934. Pragmatism and Pragmaticism. In Hartshorne, C. and P. Weiss, editors. *The collected papers of Charles Sanders Peirce* Vol. V. Cambridge, MA: Harvard University Press.

Polanyi, M. 1966. *The Tacit Dimension.* New York, NY: Doubleday and Co.

Ramachandran, V. 2003. Purple numbers and sharp cheese. *BBC Reith Lectures 2003: the emerging mind.* BBC Radio 4. (Accessed June 1, 2009) http://www.bbc.co.uk/radio4/reith2003/lecture4.shtml

Ramachandran, V., E. Hubbard, P. Butcher. 2004. Synesthesia, Cross-Activation, and the Foundations of Neuroepistemology. In Robertson, L. and N. Sagiv, editors. *Synesthesia: Perspectives from cognitive neuroscience.* Oxford, UK: Oxford University Press, 147-190.

Ramachandran, V. and E. Hubbard. 2006. Synesthesia: what does it tell us about the emergence of qualia, metaphor, abstract thought, and language? In van Hemmen, J. and T. Sejnowski, editors. *23 Problems in Systems Neuroscience.* Oxford, UK: Oxford University Press, 432-473.

Rust, C. 2007. Unstated contributions—how artistic inquiry can inform interdisciplinary research. *International Journal of Design,* 1.3, 69-76.

Saussure, F. de 1966. *Course in General Linguistics.* Chicago, IL: Open Court.

Skaggs, S. and G. Shank. 1997. Codification, inference and specificity in visual communication design. *Zed,* 4, 54-59.

Skaggs, S. 1997. Introduction. *Zed,* 4, 8-9.

Sless, D. *Design Philosophy.* Communication Research Institute of Australia. (Accessed June 23, 2009) http://www.communication.org.au/dsblog/?p=43

STC. 1998. STC ethical principles for commmunicators. Society for Technical Communication. (Accessed July 5, 2009) http://www.stc.org/about/policy_ethicalPrinciples.asp

Stjernfeldt, F. 2007. *Diagrammatology: an investigation on the borderlines of phenomenology, ontology, and semiotics.* Berlin: Springer.

Storkerson, P. 2008. Is disciplinary research possible in communication design? *Design research quarterly,* 3.2, 1-8. (Accessed July 15, 2009) www.drsq.org

Tolman, E. 1951. *Purposive behavior in man and animals.* Berkeley, CA: University of California Press.Visual Communication Institute. 2009. (Accessed July 15, 2009) http://www.baselschoolofdesign.ch/

Wertheimer, M. 1923/1958. Principles of erceptual organization. In Wertheimer, M. and M. Beardslee, editors. *Readings in Perception.* New York, NY: Van Nostrand.

Winkler, D. 1997. Design practice and education: moving beyond the Bauhaus model. In Frascara, J., editor. *User-centered Design: mass communications and social change.* London: Taylor and Francis.

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VISUAL COMMUNICATION FOR MEDICINES: MALIGNANT ASSUMPTIONS AND BENIGN DESIGN?

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ABSTRACT

An area of visual communication that might be classified as a 'design failure' is the visual presentation of information about 'prescription-only medicines' for patients. This information is provided on packaging, leaflets, brochures, labels and websites. The practical issue is that there are problems in convincing patients to take medicines appropriately and effectively. Some of the assumptions that underlie the development of visual information for patients could be incorrect. A visual rhetoric framework is applied to help this article answer two questions:

- is the current visual information about medicines a 'communication failure'?

- can visual rhetoric be used as a framework to indicate failures?

The results show that visual rhetoric can be used as a basis for describing communication failures, but it needs to be incorporated into a larger 'visual argument' structure. 'Visual rhetoric' should be augmented by 'visual dialectic' (dialogues between commissioner and designer, and interactions between patient and artifact) and 'visual logic' (fundamental visual relations). The analysis indicates that visual information about prescription-only medicines for patients is—in general—not optimal and can therefore be seen as a failure. Application of some of the visual rhetorical principles indicates possible ways forward.

INTRODUCTION: 'INFORMATION ABOUT MEDICINES'

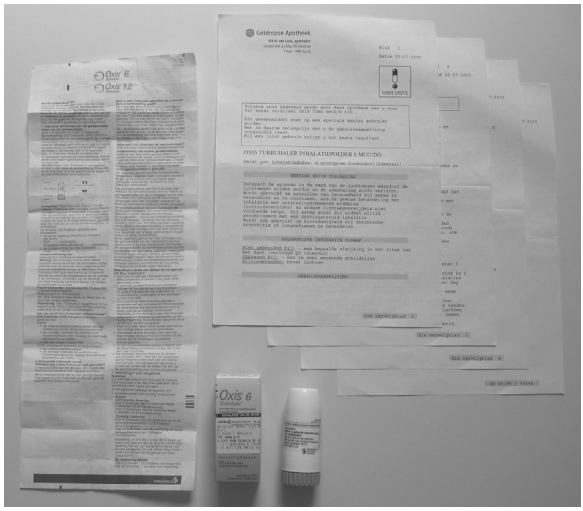
In order to clarify the scope of the issue, and before an analysis can be made, it is necessary to consider a few facts about medicines. Four groups of figures can be used as indicators:

1) The number of mistakes or errors leading to casualties and harm. The publication of the report, 'To err is human,' in 2000 lead to an increase in research interest in 'error rates' (IoM, 2000).
2) Poor effectiveness (compliance, concordance, adherence). Although there are large variations between different types of medicines, there is a consensus that it is a major problem to persuade people to acquire certain medicines and take them as directed.
3) Increasing costs. Every year, the total costs of medicines increase by about ten percent.
4) Increasing use of medicines. In general, elderly people use more medicines and demographic trends indicate that this population is increasing. Furthermore, there is a trend that the use of preventive medicines—medicines that are used to avoid or delay health problems—increases too.

The literature on these issues is substantial and the figures related to these four areas vary considerably according to definitions, area, medicine type and data-gathering methods. However, the trends are clear in all four groups. They are likely to continue despite the fact that there are many initiatives that try to reverse them. Although these trends are worrying and need attention, it is beyond doubt that most medicines are used successfully: they cure and improve the quality of life.

The aim of providing information about medicines to patients is clear: to enable patients to make decisions about medicine use and to enhance appropriate and effective use. It is close to impossible to take medicines without information and this information supply has therefore a direct influence on effectiveness and error-rates.

The information about prescription-only medicines is in most situations a combination of aural and visual sources. Doctors and pharmacists provide aural information. Visual information comes from several sources, such as the pharmaceutical industry, health advocacy groups and health magazines. [This article focuses on 'prescription-only medicines' that are used by patients at home. Other groups of medicines, such as the 'over-the-counter medicines' or medicines that are only used by professionals in hospitals are not further discussed.]



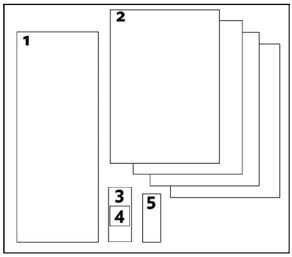


Figure 1
All of the visual information that is provided with one product in the Netherlands: double sided package leaflet [405 x 160 mm] (1), four single sided A4-sheets from the pharmacists (2), outer box (3), pharmacist label (4) and inhaler (5). There is no obvious starting point, nor a clear sequence. If a patient needs to take two medicines at the same time, the amount of information doubles: two package leaflets, two boxes, two products and eight sheets of A4 paper.

The information that is supplied with one single medicine is shown in Figure 1. When a patient sits at a kitchen table and considers the use of this medicine, all this visual information is available. Based on this information, in combination with the recalled aural information from a doctor and a pharmacist, a patient should be able to make an informed decision whether to take this medicine, when to take it and how to take it. Although these questions are fairly simple, the answers are hard to find in the provided information.

One of the reasons that this has become difficult is the context in which visual information is produced. The development of visual information about medicines is a fairly complex undertaking. Several detailed descriptions of the development process of package leaflets (Schikl, 2007; Sommer, 2007; van der Waarde, 2009) and packaging (National Patient Safety Agency, 2008) highlight this complexity. Furthermore, the legal basis for visual information differs from nation to nation. This article has a strong European bias and it should be noted that information supply practices within Europe still vary

substantially. For example, the information that is provided by pharmacists—the label and the A4 sheets—differ in many aspects.

In a nutshell, the development process for the package leaflet and packaging comes down to filling in a template (QRD, 2006), designing a leaflet and a box within the applicable production requirements, testing the leaflet for readability (according to the Readability Guideline, 2009) and submitting all documents and mock-ups for approval to the appropriate regulatory authorities who decide if a medicine is safe enough to be sold to patients, and if the accompanying information is evidence-based.

The question that needs to be answered now is if the provided information optimally enables patients to use medicines appropriately. In other words: is there any evidence that the visual information that is shown in Figure 1 could be seen as a communication design failure? In order to answer this question, it is necessary to select an appropriate approach that would distinguish between 'enabling' and 'hampering' patients.

INTRODUCTION: 'VISUAL RHETORIC'?

Ivor Armstrong Richards described rhetoric as *"Rhetoric, I shall urge, should be a study of misunderstanding and its remedies"* (Richards, 1936). If 'communication design failures' are 'visual misunderstandings,' then 'visual rhetoric' could be used to study this area. The notion that design could learn from rhetoric has been described in several publications over the last fifty years. The general assumption is that *"…in principle, rhetoric enables everyone to communicate successfully in varying contexts"* (Joost and Scheuermann, 2006, 3). Poggenpohl provides an historical overview of the development of rhetoric in relation to design (1998, 203-213) and some recent publications (Joost and Scheuermann, 2007; Ehses, 2009) have developed this discussion further. Keith Kenney and Linda Scott wrote a review of the literature and concluded: *"There are great differences in how rhetoric is defined and, when visual rhetoric is defined, there also is great variability"* (Kenney and Scott, 2003).

Traditional rhetoric has always been seen as both 'the practice of persuasive communication' as well as 'studying this communication' (Buchanan, 1985, 6). Gesche Joost and Arne Scheuermann (2006, 5) state the same idea.

… the rhetoric of the design process can thus be formulated as:

- *a production system that includes a collection of communicative strategies and techniques which are used in the production of media. This production aims at a convincing and appealing design for the addressee;*
- *an instrument for media analysis aiming at the exploration of argumentative, affective and construction principles.*

Hanno Ehses took these descriptions and made a diagram based on a model by Barry Brummett (2006). The diagram by Hanno Ehses (2009, 15) shows "the principles of rhetoric discourse production" *(see figure 2).*

A		**THE SITUATION**
	Context	(Place and time).
	Exigency	(Problem, issue or event).
	Audience	(Profile, strengths and weaknesses).
B		**THE SPEAKER / RHETOR**
	Background	(Qualifications, experience, reputation).
	Intentions	(Goal and purpose).
C		**THE SPEECH / ARTIFACT**
Inventio	Invention	Finding what to say (*logos*, *pathos*, *ethos*).
Dispositio	Arrangement	Structuring and ordering what is found.
Elocutio	Style	Choice of fitting language, literal and figurative, in consideration of appropriateness, clarity, correctness, and ornamentation.
Memoria	Memory	Committing to memory (today, we tend to rely on technical media).
Actio	Delivery	Performing the discourse like an actor (today, performance includes the design of all kinds of communication material, the staging of events, the display of products, and techniques of presentation).

Figure 2
Hanno Ehses (2009, 13) states: "As an instrument for analysis, it [rhetoric] aims to explore argumentative, affective, and stylistic construction principles." Ehses based this table on a model by B. Brummett (2006).

In the next section, this diagram of rhetorical principles is used as a basis to critically analyze visual information about medicines. From the outset, it is clear that it is not possible to deal with both topics—'visual rhetoric' and 'information about medicines'—in depth in a single article. Both are substantial areas of study and relating these in detail would simply exceed the length of an article. The following application of rhetorical principles to information about medicines is therefore necessarily truncated.

APPLYING 'VISUAL RHETORIC' TO INFORMATION ABOUT MEDICINES

The first category in the table of Hanno Ehses *(figure 2)* is "The situation." This category includes the context (place and time), exigency (problem, issue or event) and audience (profile, strengths and weaknesses). The second category encompasses the background and intentions of the speaker. These two levels are very briefly discussed in the first section of this article and can be summarized as:

The situation:

- context: *Europe 2009.*
- exigency: *The problematic use of prescription-only medicines by patients.*
- audience: *Patients.*

The speaker/rhetor:

- background of the speaker: *pharmaceutical industry.*
- intentions of the speaker: *inform patients to enable them to use medicines correctly and effectively.*

The third category mentions the five steps in a rhetorical process. In the rhetorical tradition, these five steps need to be executed if a speaker wants to persuade an audience. An application of these steps should highlight the failures and successes of visual information about medicines.

Step 1: Inventio

In the rhetorical tradition, the first step of successful communication is to collect materials and arguments. This first step starts based on an understanding of the task, a specific context and a specific audience. There are three types of appeal, or three modes of proof, that can be used as a basis:

- What are the rational arguments? It is necessary to create a reasonable and intelligible formal structure (formal name: Logos).

- How should the speaker portray himself? The credibility and character of the speaker need to be established (formal name: Ethos).
- What are the emotional arguments? Which state of mind or feeling in the audience/listeners should be created (formal name: Pathos)?

Buchanan (1985, 9) summarizes these three as "technological reasoning, character and emotion."

For information about medicines, this step encompasses the collection of information legally required to be put onto package and package leaflet. The contents of the information that appears on boxes and package leaflets is strictly regulated in European Directive 2004/27. The regulatory authorities in Europe provide detailed templates that need to be filled in (QRD, 2006). The templates demand that information must be based on scientific information, and it stipulates exactly what needs to be mentioned on the packaging (outer box, inner packaging) and package leaflet. A closer look at the three rhetorical appeals exposes several issues with the use of this template and its legal basis.

Logos

The European Directive 2007/24 not only states which information elements must be mentioned, but it also states that these elements must appear in a specific order. All medicines—whether for a single occasion or for a chronic disease, whether for minor ailments or life threatening illnesses, for use by patients or for use by professionals—will get the same structure of the information elements. This might be a good approach, if patients are persuaded by the logical structure and rational arguments. Two very practical examples show that this approach is not entirely suitable for all patients.

Example 1: The emphasis in a package leaflet seems to be on potential side effects and not on potential benefits. The information about benefits is a brief description of the group of medicines with a single sentence describing the expected effect. Some additional information can be added here, but only if it is of benefit to the patient. The list of potential side effects frequently runs into twenty or more different side effects. The difference in length (a single benefit versus a substantial list of side effects) makes it very difficult for patients to make a rational decision. It always gives the impression that the potential risks of side effects outweigh the potential benefits.

Example 2: The information does not refer to the effectiveness of a medicine. The frequencies of side effects are provided in five categories from 'very common (more than 1 in 10 patients might get these)' to 'very rare (these affect less than 1 in 10,000 patients).' Unfortunately, the likely effectiveness of a medicine is not discussed. This implies that a medicine is always optimally effective in all circumstances. However, for some medicines, in some situations, it might be possible to include a statement like: 'This medicine cures the illness in 60% of patients, and substantially reduces the symptoms in a further 20% patients. This medicine does not have any positive effect in 5% of patients. Furthermore, it has not been proven that this medicine is more effective than other medicines with the same active ingredient.' This information, together with a short description about 'the risk of not taking,' might enable a more rational decision, especially when this message reiterates the information that is given by the doctor and pharmacist.

Observation 1: Patients cannot be sure if all arguments are provided. The length of the text in a leaflet seems to imply that everything possible is mentioned, but a suspicious patient expects that information might be intentionally hidden or left out completely. Information about risks and benefits, effectiveness and 'taking or not taking?' is not always available. For a patient, this might make the logical arguments in a package leaflet hard to accept.

Ethos: character

For patients, it is clear that the pharmaceutical industry writes and designs the packaging and package leaflet. A common reaction from patients during usability tests is 'They just have to cover themselves with all this information.' After reading a package leaflet during a usability test, patients realize that there seem to be several voices in a package leaflet. It is not only the pharmaceutical industry who provides information. The following three standard phrases from the QRD-template show that there are different sources. These three sentences are obligatory and must be included, but all three refer to a different character:

- "If you have any further questions on the use of this product, ask your doctor or pharmacist."
- "For any information about this medicine, please contact the local representative of the Marketing Authorisation Holder."
- "This leaflet was last approved in <date/month/year>."

These three sentences show the split personality of the speaker/rhetor. The leaflet comes from a pharmaceutical industry, but it refers directly to 'your doctor or pharmacist,' the 'local representative of the Marketing authorisation holder,' and to 'someone who has approved the leaflet on a specific date.' From a rhetorical point of view, this lack of clarity about the origin of the information is problematic. It makes it difficult for patients to trust the information because the originator of the information is unclear. The text in the leaflet implies that your doctor or pharmacist, a representative of the marketing authorization holder or the person who approved the leaflet could be approached if there are any questions. In usability tests, patients expect to see a direct contact address of the pharmaceutical industry: telephone numbers, websites, e-mail addresses. Instead of this, they are directed to other information sources. The image of the speaker is therefore weak. Patients get the impression that the pharmaceutical industry does not take its responsibility, but refers to others.

Observation 2: The package leaflet does not make it clear 'who is talking.' Is it the pharmaceutical industry, a doctor or pharmacist, or an unidentified approval authority? This lack of clarity about the character of the provider of information weakens the credibility of this type of appeal.

Pathos: emotions

Buchanan phrases the pathetic appeal as (1985, 16): *"The problem for design is to put an audience of users into a frame of mind so that when they use a product they are persuaded that it is emotionally desirable and valuable in their lives."* Do the current packaging and package leaflets put patients into a specific 'frame of mind'? Of course, prescription-only medicines are prescribed by doctors and dispensed by pharmacists who both endorse the idea that it is worth taking medicines. The process of obtaining prescribed medicines is already intimidating enough, and if two highly educated professionals tell a patient that medicines are 'valuable in their lives,' what could go wrong?

Furthermore, during the registration process, package leaflets and packaging are very carefully scrutinized to make sure that they don't contain "any information that is of a promotional nature" (Directive 2004/27, 2004). Most emotional arguments are therefore not acceptable in leaflets and on packaging for prescribed medicines. This is directly linked to discussions about "direct to consumers advertising" of medicines and the use of television and Internet for this purpose. At the moment, emotional arguments seem to be mainly reserved for advertising and over-the-counter medicines.

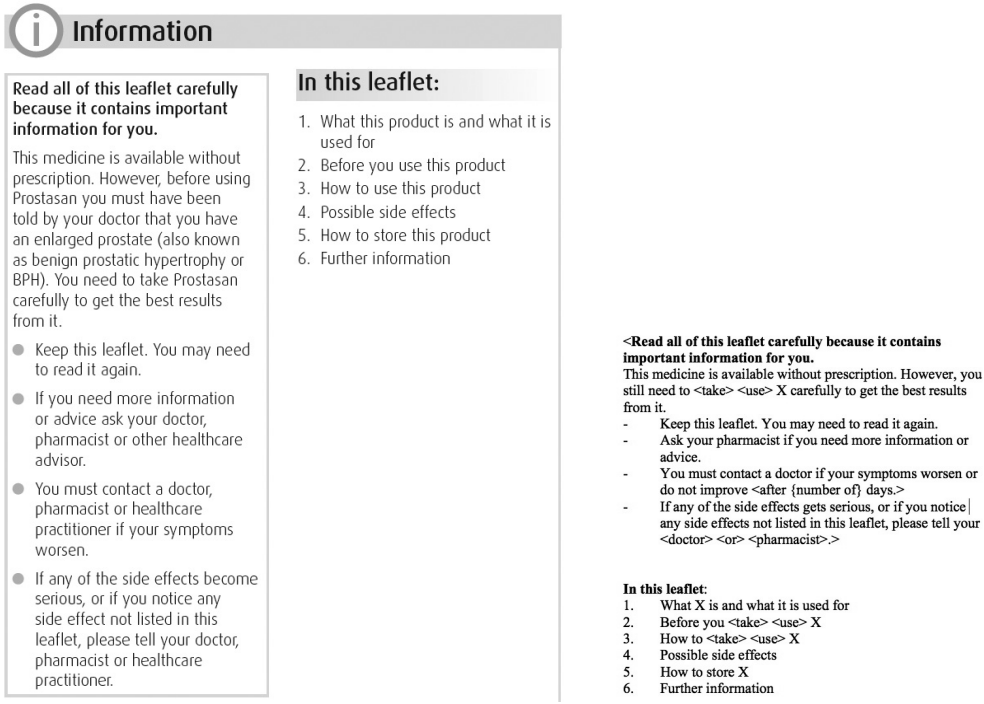
There are a few emotional arguments in the visible information as it is presented Figure 1. A first group of emotional arguments can be found in the texts that are based on the QRD-template. For example, the first sentence of the package leaflet states: *"Read all of this leaflet carefully before you start taking this medicine."* It is possible to modify this sentence a little and in Figure 3, it is rephrased as *"Read all of this leaflet carefully because it contains important information for you."* These sentences do seem to address emotions of patients in a fairly paternalistic way. The ambiguous author of the text worries that patients could read a leaflet carelessly and that they are not able to value the importance of the information for themselves. This first sentence of the package leaflet does put 'the audience in a frame of mind,' but it is doubtful if this is beneficial.

The second group of emotional arguments has to do with the experience of unpacking and unfolding the information about medicines. Before a patient can start reading they have to unpack a medicine bag, open a medicine box, unfold the package leaflet and the information from the pharmacist and consider a starting point. The daunting task of reading texts of a few thousand words and applying this to a personal situation is not very encouraging. The 'package leaflet unfolding experience,' the 'where is the starting point search' and the 'what is important for my decision' do put patients in a specific 'frame of mind,' but it is doubtful if this is really beneficial for successful communication.

> *Observation 3: The emotional appeal is poorly treated. Both the general task of handling a substantial amount of information as well as the micro-level paternalistic phrases do not put an audience into a suitable frame of mind.*

It is surprising that the result of the inventio step is a tidy text-document that is accurately based on the QRD-template. This document contains all the information that is legally required. Unfortunately, in some situations it is not all the information that patients really need to make a rational decision; the character of the originator is ambiguous, and the information does not really help to put patients in a suitable frame of mind. Furthermore, there is no evidence that the different rhetorical

appeals are considered together. Despite these three observations, the collected arguments and materials can now be visually designed into a package leaflet and packaging.



Information

Read all of this leaflet carefully because it contains important information for you.

This medicine is available without prescription. However, before using Prostasan you must have been told by your doctor that you have an enlarged prostate (also known as benign prostatic hypertrophy or BPH). You need to take Prostasan carefully to get the best results from it.

- Keep this leaflet. You may need to read it again.
- If you need more information or advice ask your doctor, pharmacist or other healthcare advisor.
- You must contact a doctor, pharmacist or healthcare practitioner if your symptoms worsen.
- If any of the side effects become serious, or if you notice any side effect not listed in this leaflet, please tell your doctor, pharmacist or healthcare practitioner.

In this leaflet:

1. What this product is and what it is used for
2. Before you use this product
3. How to use this product
4. Possible side effects
5. How to store this product
6. Further information

<Read all of this leaflet carefully because it contains important information for you.
This medicine is available without prescription. However, you still need to <take> <use> X carefully to get the best results from it.
- Keep this leaflet. You may need to read it again.
- Ask your pharmacist if you need more information or advice.
- You must contact a doctor if your symptoms worsen or do not improve <after {number of} days.>
- If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please tell your <doctor> <or> <pharmacist>.>

In this leaflet:
1. What X is and what it is used for
2. Before you <take> <use> X
3. How to <take> <use> X
4. Possible side effects
5. How to store X
6. Further information

Figure 3
A detail of the text of the QRD-template (left) and a detail of a package leaflet (right). Most of the text in this section of the package leaflet is directly based on the text in the QRD-template. (This leaflet on the right is published by the British Regulatory Authorities MHRA. It is a 'leaflet of the month' and should be seen as a 'good example.')

Step 2: dispositio

This second step in the rhetorical process is the organization of the materials and arguments that have been gathered. In the dispositio step, the concept, genre and structure are chosen. The EU-regulations stipulate exactly what needs to be presented, where it needs to appear and in which order.

The sequence and contents of the information cannot be changed; the structure of the argument is therefore dictated by the legal framework. This makes it very difficult for different groups of writers to emphasize a certain perspective to make sure that their own aims are reached.

Observation 4: The regulations make alternative sequences of information illegal. A substantial change would be in conflict with the EU-regulations or the QRD-template and would therefore not be approved by the regulatory authorities.

The information from pharmacists does not have to follow this strict sequence and this could potentially be a substantial benefit. This benefit is diminished because the information-sheets from the pharmacist will always be seen at the same time as the package leaflet. Not following the sequence of the regulations makes it nearly impossible to compare the information.

Observation 5: The information on the different artifacts (as shown in figure 1) does not provide patients with a clear narrative structure. The information does not indicate a starting point or a straightforward sequence of actions.

Step 3: elocutio

The third step in the rhetorical process consists of selection of fitting language. Although the texts of package leaflets in Europe have undoubtedly become easier to understand in the last fifteen years, the package leaflet is still be characterized by small type on very thin paper. The content matter does not really lend itself to use figurative language, ornaments or rhetorical embellishment.

Especially the length of package leaflets has become a major issue. The QRD-template demands that about 400 words are included, and the length of a complete leaflet can easily become 1500 words or more. Together with the information from the pharmacist, the pharmacist label and the information on the packaging, it becomes not so much a matter of fitting language, but of reducing the length to manageable proportions.

Observation 6: The patient gets the impression that the information is not suitable for him or her. There is too much and the combination gives the impression that it is too complex.

Step 4: memoria

Traditional rhetoric was about speech and the art of speaking in public. It was vital to learn a complete speech by heart. At the moment, this fourth step of memorizing does not seem to be applicable to visual communication. Hanno Ehses (2009, 15) suggests: "From a design perspective, it would make sense to update this phase to address the technical knowledge and skill requirements that are needed to prepare a piece of print for production or digital implementation." This is a valuable suggestion and it is recognizable in practice. Unfortunately, the

technical knowledge and skills are only partly used at the moment. The information that is currently provided to patients consists mainly of paper artifacts. The digital media are conspicuously absent. The information sheets from the pharmacist and the package leaflet mention a telephone number and postal addresses, but e-mail addresses or websites are not provided anywhere. The technical knowledge and skills to develop these digital artifacts are available, but are not used.

Observation 7: If Ehses' suggested update is accepted, then the information for patients does not optimally use the available technical knowledge and skills. The technical knowledge and skills in relation to digital media is well ahead of current practice in information about medicines.

Step 5: actio

The final step in the classical rhetorical process is the delivery of the speech. Hanno Ehses *(see figure 2)* suggests that this includes *"the design of all kinds of communication material, the staging of events, the display of products, and techniques of presentation."* Gesche Joost alludes to the same issue: *"The last two phases, memoria and actio are relevant for the presentation. Here, the designer finds techniques to prepare an eloquent presentation, to grab the audience's attention and to persuade them of the artefact's quality"* (Joost and Scheuermann 2006).

Both authors refer to the 'presentation,' but this has at least two meanings. In professional design practice, there are at least two types of presentation for a designer. The first one is the presentation of a prototype to a commissioner and the second one is the presentation of the object to the consumer or beholder, or in this case, the patient. Both require 'eloquent presentation,' but these are very different when information about medicines is discussed. The general descriptions of Gesche Joost and Hanno Ehses are probably not detailed enough to apply them to an analysis of information about medicines.

Observation 8: The fifth step of 'presentation' does not distinguish between 'presentations for commissioners' and 'presentations for patients.' This makes it difficult to apply it to the development of information about medicines.

Not detailed enough?

The application of the rhetorical instrument of Hanno Ehses shows that the development of information about prescription-only medicines diverges at several points from the five steps of a rhetorical process. There are discrepancies in the selection of the contents, the structure of the argument and the style in which the argument is presented.

The last two steps indicate that information about medicines need to be discussed in more detail. And this is where the instrument of visual rhetoric—as it is presented in Figure 2— shows its limits. For example, the instrument does not differentiate between a presentation for a commissioner in the form of a unique prototype and a presentation of a mass-produced artifact for a patient. A second example is that the relation between 'commissioner' and 'designer' needs to be included. Although both are working together to reach a common aim, they do this from very different starting points.

Furthermore, there are several issues that would not be detected by this instrument. Some of the standard problems with information about medicines, such as small typesizes, confusing pictograms and difficult instructions were not caught. And the rhetorical framework does not describe all activities in the process of information development. As an example, the usability testing of visual information is not easy to put into this table, because it is not presented as an iterative process.

Richard Buchanan (2001, 17) touches on these discrepancies by suggesting: *"Our early theories of design found expression in grammars and logics of design thinking, but the new design finds expression in rhetoric and dialectic."* Sharon Poggenpohl (1998, 212) mentions this as well by stating the following: *"He [Aristotle] defines three methods: 'analytics, dialectics and rhetoric. Analytics are concerned with the grammatical relationships between subjects and predicates; dialectics deal with dichotomous relationships formed by question and answer; rhetoric explores appearance by proposing themes and arguments which invite judgement, decision and action"* (quoting Thomas B. Farrell, *Norms of Rhetorical Culture,* 1993).

It seems that, in order to describe the problems with visual information about medicines, it is necessary to look at analytics (grammars and logics) and dialectics (dialogues) too.

VISUAL LOGIC / VISUAL ANALYTICS / VISUAL GRAMMAR

Visual logic looks at visual elements and the relations between these elements. The number of types of elements is limited to text, images, schematic elements and inseparable combinations. These types of elements can be related to each other in four different ways (Waarde, 1999):

- elements can be placed close together (proximity). This is an indication that these elements should be interpreted together.
- elements can be made larger or smaller (prominence). This is an indication of importance: larger elements are more important than smaller ones.
- elements can be made to look similar (similarity). The more similar elements look, the more similar their function.
- elements can be put into a visual succession (sequence). Elements that are placed earlier in a sequence should be read earlier.

Below are four examples of visual elements. It would be fairly easy to show a few hundred of these examples. In order to structure and analyze these examples, it would be necessary to provide a detailed description of the European guidelines related to these visual elements and compare this with current professional practice.

The four examples below illustrate that the rhetorical analysis instrument does not cover the whole area of rhetorical discourse production. The instrument would not have detected the problematic issues in any of these examples.

Example 1: Text

Figure 4
*Text elements. The differences between the names 'Emconcor' and 'Emcoretic' is not very much, and it is not unlikely that these names might cause some confusion. The visual differentiation of these names could have been made more prominent. Sandra Gabriele (2006) investigated this and one of the conclusions was that just making the difference bolder would already help: Emco**ncor** and Emco**retic.***

Example 2: A pictogram

Figure 5
Pictorial elements. This pictogram is used in the United Kingdom and appears on some medicine packaging. It means: 'Do not reuse. A single-use device is used on an individual patient during a single procedure and then discarded. It is not intended to be reprocessed and used again, even on the same patient.' For some medicines, it is obligatory to place this pictogram on the outer packaging.

Example 3: Schematic elements

Figure 6
Schematic elements. Pharmacists must be able to distinguish between these two boxes. The left hand side package contains 30 tablets of 1 mg each, and the right hand side 20 tablets of 5 mg each. In order to help pharmacists to distinguish these boxes, schematic elements are introduced. The 1 mg-box has a single band around it; the 5 mg-box has two bands. When looked from the front, only the single and double ends of these bands are visible.

Example 4: Inseparable combination

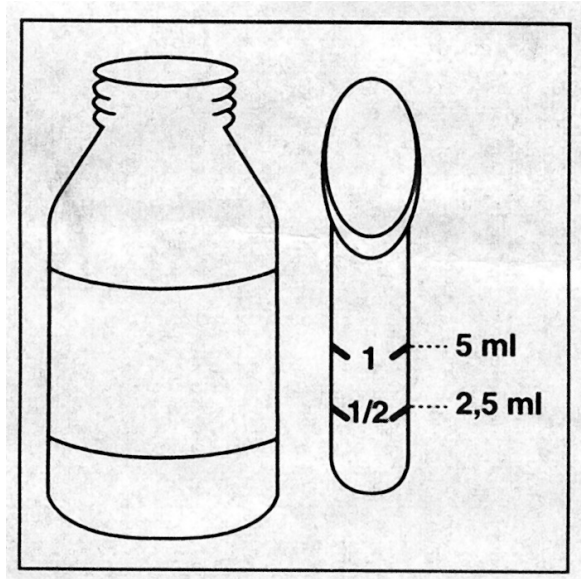


Figure 7
Inseparable combinations. In this instructional diagram, the patient is made aware of the volume of one dose. One dose is 5 ml and half of one dose is 2.5 ml. (Bristol-Myers Squibb, Belgium, Duracef, 2004).

Observation 9: The design of visual elements and their relations needs to be scrutinized. Tiny typesizes, poor typography, confusing illustrations and vague pictograms are fairly common. It is essential to include these in the analysis of 'potential communication design failures' too.

VISUAL DIALECTIC

Apart from visual rhetoric and visual logic, there is a third type of argument that might need to be considered: visual dialectics.

Poggenpohl (1998, 226) suggests that *"all designers … are developing rhetorical representations as prototypes of the idea to be realized."* In this view, a prototype is a kind of 'ill-formed' argument that *"is a way to postulate some proposed design for a kind of reality check with those involved whether clients, other designers or end users"* (1998, 229). She concludes *"rhetoric is a design tool supporting human decisions."* Although it is certainly true that designers must try to persuade commissioners about the values of a prototype, this does not seem the main reason to develop prototypes. The main reason—at least as far as information about medicines is concerned—is to stimulate a dialogue with a commissioner and with patients who might use the finished product in the future.

For information about medicines, a 'reality check,' or 'presenting' as Hanno Ehses describes it, is not sufficient in practice. Commissioners, other designers and patients need to discuss prototypes and interact with them directly. It is not only a matter of 'persuading' commissioners, designers and patients of the benefits of a prototype, but it is essential to get involved in a dialogue. It is this dialogue in which different opinions are discussed that reveals appropriate ways forward.

It might therefore be fruitful to look at two different 'dialogues' to find out if there are any other 'visual communication design failures' in this realm:

- dialogue 1: the dialogue between commissioner and designer, evoked by a prototype. This dialogue is an essential part of the co-operation between designer and commissioner.
- dialogue 2: the interaction between patient and visual information. This is the interpretation, understanding and application of the information about medicines.

Dialogue 1: Commissioner – designer (co-operation and service)

The first dialogue is the discussion between a commissioner and a designer about a prototype. In this discussion, the intentions of providing information to patients are considered. In practice, this is a difficult dialogue, because it needs to consider intentions from several different groups who are not directly taking part in the discussion.

Every dialogue between a commissioner and a designer is guided by the question: 'Is this a legal prototype?' In other words, are there any regulations or guidelines anywhere that state that this proposal is not disallowed? The intentions of these regulations and guidelines are to make sure that all information that is provided to patients "protects them against incorrect claims" and to standardize it in such a way that "a free movement of goods within Europe" is enhanced.

Different departments within a pharmaceutical company provide a second diverse group of intentions. The information for patients is usually the responsibility of a regulatory affairs department. Their aim is to register a medicine as accurately and as quickly as possible. This department needs to consider several intentions from other departments, such as medical affairs (are we sure that this medicine is effective?), marketing (how can we sell this?) and production (when do we need to start?). These have a direct influence on the contents and the design of information about medicines, but are rarely directly involved in a dialogue.

A third group of intentions are provided by a designer, or better a design-team. This team consists of a writer, a designer and a usability tester. Their intention is to make sure that the information for patients passes the 'readability test.' The aim is to make the visual information as suitable for patients as possible.

And finally, the fourth group of intentions is provided by the regulatory authorities who ultimately register medicines and provide a license to sell. The aim of these authorities is to make sure that all claims are correct and can be verified. They also accurately check if the visual information conforms to all regulations and guidelines.

The visual information about medicines for patients, as shown in Figure 1, show the result of a combination of all these different intentions. The single intention that was mentioned earlier *"inform patients to enable them to use medicines correctly and effectively"* is therefore only partly correct.

Observation 10: Information about medicines for patients is guided by several different intentions. Only some of these can be discussed and negotiated.

Apart from the intentions, it is also worth looking at the five steps of the rhetorical process. There is a clear similarity between the construction of a speech and a design process. Ideally, the commissioner has to be involved in these steps through a dialogue with a designer, so that an appropriate result can be achieved. Unfortunately, the rhetorical process has little to do with the way in which information about medicines is developed.

The development of information about medicines does *not* start with the consideration of the most appropriate rhetorical appeal in a specific context. The collection of information starts with a template and regulations that only partially incorporate the knowledge and expectations of patients. The invention step (inventio) is therefore not fully explored. The European directive determines the structure of the argument. An alternative structure of the different arguments that suits patients (dispositio) is prohibited. The development of a suitable format (elocutio) is predetermined: it must be a folded leaflet or a tiny booklet that fits into a medicine box. Length of the text and production requirements dictates the dimensions of the leaflet. At this point, outside the rhetorical process, a usability test must be undertaken. At least twenty people need to be asked if they can find information and if they can understand the information. Their answers will only have a minor influence on the contents, but the structure of the leaflet and the choice of the leaflet-format itself cannot be modified. The regulatory authorities accept the end of the third step (elocutio) as 'final version.'

Observation 11: Technological knowledge and skills (memoria) and presentation (actio) are not applied to their full potential. The current development process of information about medicines diverts from the tried and tested rhetorical processes of developing an appropriate argument.

Dialogue 2: Patient – visual information (interpretation)

Interaction of patients with visual information about medicines can be observed directly; simply by contacting patients and asking for their co-operation. Their first hand experience will tell exactly how the information that is shown in Figure 1 is used in real life. Observing patients while they are interpreting visual information and asking questions about what they found and understood reveals some of the opinions patients have and it reveals a sequence of questions. These questions and the sequence in which they are asked depend on the type of medicine and the context in which the medicine is used.

At the moment, only a 'usability test' of package leaflets is conducted, but this test is not completely representative for real-life decisions. A readability test finds problematic issues in a single package leaflet without any doubt, but it will not show the problems of patients when they have to take two different medicines at the same time and have to deal with around a dozen artifacts.

Without going much further into additional information suppliers (internet, phone help lines, friends, health magazines), it is obvious that it is difficult for patients to find relevant and reliable detailed information. Usability studies and contextual inquiries indicate that patients expect information that is differentiated according to their needs, type of medicine and context.

Observation 12: Visual information about medicines does not start from the perspective and existing knowledge of patients. In general, it ignores the context and specific requirements by providing a 'one-size-fits-all.' This makes the interpretation of visual information about medicines difficult.

Figure 8
A bin in a hospital pharmacy. In order to stock and dispense medicines in a hospital, the pharmacist removes outer packaging, leaflets and trays. None of this carefully developed and meticulously regulated information about medicines reaches patients in hospitals. Similar leaflets and packaging of medicines that are used at home are read and used very well. It might be beneficial to distinguish between these different contexts of use, but the European legislation is based on the idea that all medicines must be provided with the same information.

DISCUSSION: IS IT A FAILURE?

The application of the visual rhetoric instrument *(figure 2)* to information about medicines shows that at least eight critical observations can be made. Two other types of arguments—visual logic and visual dialectics—add another four observations. The following table shows the results of the analysis of visual information about medicines for patients according to the rhetorical instrument. (Parethetical numbers below refer to observations.)

Visual Rhetoric	**Observations from analysis**
A The Situation	
• context: Europe 2009.	• No change
• exigency: The problematic use of prescription-only-medicines by patients.	• No change
• audience: Patients	• No change
B The speaker/rhetor	
• background: pharmaceutical industry	• At least 5 different voices are involved.
• intentions: inform patients to enable them to use medicines correctly and effectively	• There are very different intentions: standardization, swift registration, and scientific and non-promotional accuracy (10)
C The speech/artifact	
• Inventio (invention)	• Several simultaneous but un-coordinated processes (1)
Logos (rational arguments)	Hard to accept for patients (2)
Ethos (character)	Ambiguous and unclear (3)
Pathos (emotions)	Underused; counter-productive (4)
• Dispositio (arrangement)	• Hardly possible (5); No narrative structure (6)
• Elocutio (style)	• Underused; questionable format (7)
• Memoria (memory)	• No optimal use of technological skills (8)
• Actio (delivery)	• 'Presentation' needs to be more detailed
Visual Logic	
• Text	• Not according to professional standards (9)
• Images	• Not according to professional standards (9)
• Schematic elements	• Not according to professional standards (9)
• Inseparable combinations	• Not according to professional standards (9)
Visual Dialectics	
• Dialogue between commissioner and designer	• Process does not follow 'best practice' (11)
• Interpretation of visual information - patient	• Information does not start from perspective of patient, and ignores existing knowledge, context and specific requirements (12)

If the principles of visual rhetoric—which is the study of visual misunderstanding—is applied to visual information for patients, then it is clear that this information fails to optimally convince and support patients. The analysis shows that the visual communication of information about medicines can be substantially improved. Both the process, as well as the ways this information tries to appeal to patients could be reconsidered.

However, from the point of view of several other involved parties, the information about medicines is very successful. The European regulators have achieved a standardized format across Europe that protects consumers against unmerited claims. The regulatory authorities can check and control visual information for patients very effectively, and the pharmaceutical industry can register medicines relatively quickly.

The analysis also shows that the development of visual information about medicines is based on four assumptions.

1) The first assumption is that patients are helped by standardization and by strictly prescribing the information that is required. Although it is essential to regulate information, it should not be based on a 'detailed description of the information elements,' but on the 'aims that need to be achieved.' In other words, guidelines and regulations should not be prescriptive, but must be performance based. Performance based regulation automatically takes—exactly as the rhetorical instrument suggests—the context, exigency and audience into account.

2) The second assumption is that patients are not the main influential factor when information about medicines is considered. It is clear from the analysis above that patients do not really benefit from the current information supply, but that this supply is acceptable for other main groups. The current development of standardized information makes "free trade within Europe" easier, it makes regulatory applications smoother and it makes the approval processes faster. It therefore depends on the position of the observer, if it is unfortunate or not, that the end result does not optimally enables patients to use medicines appropriately.

3) The third assumption is that 'medicines' and 'information' must be regulated in the same manner. It is essential that patients are protected against medicines that might do more harm than good. Patients are not capable to consider the safety of medicines for themselves. The legal system and the regulatory authorities are doing this very well—the number of problems with approved medicines is very small if compared with the total number of available medicines. Unfortunately, this approach of 'protection' is counterproductive when visual information is concerned. It is not possible to provide standardized information and expect that this will be effective in all circumstances without considering the knowledge and experience of patients.

4) The fourth assumption underestimates the ability of patients to recognize and interpret information about medicines. Patients can—in most situations—very well judge for themselves how they value information. There is a more than sufficient network of healthcare providers that can help to interpret information appropriately. At the moment, the different intentions and different voices in the information about medicines are confusing.

These four assumptions lead to a view that it is only necessary to 'protect patients' against 'incorrect and incomplete' information. The result is a profusion of guidelines and regulations about visual information. The uncontrolled growth leads to a continuous increase of legally required visual information. This strategy results in very long package leaflets, information on packaging that is very hard to understand and additional visual information that only increases the difficulty to find understandable instructions.

NEXT STEPS

The description of information about medicines for patients according to a preliminary division of argument theories into visual rhetoric, visual logic and visual dialectics also shows that some of the issues can be fairly easily resolved. These alternatives would provide patients with information that is suited to their task and activities in a format that can be understood and used. Visual rhetoric, supplemented with arguments from the domains of visual logic and visual dialectics, provide a way forward.

1) Start from the perspective of the actual patient. It is necessary to observe and find out how real patients interact with real information and determine what kind of visual information is required. This could lead to the development of performance based guidance which is centered around the available knowledge and experience of patients and answers their questions in a sequence that suits the context.

2) Develop alternative prototypes
Despite the fact that it would be difficult to develop alternative visual information about medicines that would fall within the current regulatory framework, it seems beneficial to develop new prototypes to stimulate the discussion between all stakeholders. Three types of prototypes should be considered:

- prototypes that could be used as starting points for dialogues with commissioners and clients. Especially in the digital domain, there is a lot to be gained.
- prototypes that are based on other combinations of rhetorical appeals (pathos, ethos and logos).
- prototypes that are based on visual logic. A detailed consideration of the visual elements and their combinations is likely to alleviate some of the problems that patients have with visual information.

Prototypes are absolutely essential to show that it is possible to develop appropriate information about medicines.

3) Clarify the development process
The description of visual rhetoric, as it is presented by Hanno Ehses, mentions the importance of a step-by-step development process that is based on the background of the speaker and their intentions and is focused on a particular situation. The current development process leads to a compromise of several intentions of different speakers without distinguishing between situations. For the benefit of patients, it might be worthwhile to reconsider this compromise.

CONCLUSION

The analysis of the visual arguments about information for patients leads to the conclusion that the current systems prevent the development of information that is suitable and appropriate for patients. This can be seen as a communication design failure. From the perspective of the pharmaceutical industry, the regulatory authorities and the European legislation, the same visual arguments can be seen as a communication design success.

The description of the visual arguments shows that at least four assumptions about effective communication related to information about medicines are malignant: standardized information that serves patients, free trade or regulatory agencies rather than patients are the focus, patients cannot assess the safety of medicines and patients cannot interpret information about medicines. These assumptions hamper the development of appropriate visual arguments that might convince patients to handle medicines appropriately. If information about medicines is intended to support, persuade and enable patients to make appropriate use of medicines, then it is necessary to take their views into account before new regulations are considered.

REFERENCES

Brummett, Barry. 2006. *Rhetoric in popular culture.* Thousand Oaks, CA: Sage.

Buchanan, Richard. 1985. Declaration by design: rhetoric, argument and demonstration in design practice. *Design Issues,* 2.1, 4-22.

Buchanan, Richard. 2001. Design Research and the New Learning. *Design Issues,* 17.4.

Directive 2004/27/EC of the European Parliament and of the Council of 31 March 2004, amending Directive 2001/83/EC on the Community code relating to medicinal products for human use, 31 March 2004.

Ehses, Hanno. 2009. *Design on a rhetorical footing.* Mexico: Centro de Estudios Avanzados de Diseño (CEAD).

Gabriele, Sandra. 2006. The Role of Typography in Differentiating Look-Alike/Sound-Alike Drug Names. *Healthcare Quarterly,* 9, 88-95. http://www.longwoods.com/product.php?productid=18465&cat=452&page=1 (Accessed July 1, 2009).

IoM (Institute of Medicine), Committee on the Quality of Health in America. 2000. *'To err is human: building a safer health system',* Washington: National Academy Press. More information: http://www.nap.edu/books/0309068371/html/

Joost, Gesche and Arne Scheuermann. 2006. Audiovisual Rhetoric. A Metatheoretical Approach to Design. Paper presented at: Wonderground. Symposium of the Design Research Society, Lisbon, 2006. http://www.iade.pt/drs2006/wonderground/proceedings/fullpapers/DRS2006_0031.pdf .

Joost, Gesche and Arne Scheuermann. 2007. Design as Rhetoric. Basic Principles for Design Research. Paper, Symposium of Swiss Design Network http://www.geschejoost.org/files/design_as_rhetoric.pdf (Accessed July 1, 2009).

Kenney, Keith and Linda M. Scott. 2002. A Review of the Visual Rhetoric Literature. In Scott, Linda and Rajeev Batra, editors. *Persuasive Imagery: A Consumer Response Perspective.* Mahwah, NJ: Lawrence Erlbaum.

National Patient Safety Agency. 2007. Safety in doses: medication safety incidents in the NHS. The fourth report from the Patient Safety Observatory. Available at: www.npsa.nhs.uk/patientsafety/alerts-and-directives/directives-guidance/safety-in-doses/

National Patient Safety Agency. 2008. Design for patient safety. A guide to labelling and packaging of injectable medicines. Edition 1, 2008. Available at: www.npsa.nhs.uk/

Poggenpohl, Sharon. 1998. Doubly damned: Rhetorical and visual. *Visible Language,* 32.2, 200 – 233.

QRD. 2006. Version 7.2. EMEA (London): Human Medicines - Quality Review of Documents (QRD) http://www.emea.europa.eu/htms/human/qrd/docs/Hannotatedtemplate.pdf

Readability Guideline. 2009. *'Guideline on the Readability of the Labelling and Package Leaflet of Medicinal Products for Human Use, revision 1, 12 January 2009.'* European Commission: Enterprise and Industry. http://ec.europa.eu/enterprise/pharmaceuticals/eudralex/vol2/c/2009_01_12_readability_guideline_final.pdf .

Richards, I.A. 1936/2001. *The philosophy of Rhetoric.* London, UK: Routledge.

Schikl, Ursula. 2007. The impact of the revised EU-legislation concerning particular needs of blind and partially-sighted patients and user testing – a challenge for pharmaceutical companies with focus on Germany. MA-thesis, Bonn, Germany: Rheinischen Friedrich-Wilhelms-Universität. http://www.dgra.de/studiengang/master_thesis/schickel.php

Sommer, Susanne. 2007. Package Leaflets: Testing and Harmonisation in relation to the overall business process in regulatory procedures - An example of the impact of changing regulatory requirements. MA-thesis, Bonn, Germany: Rheinischen Friedrich-Wilhelms-Universität. http://www.dgra.de/studiengang/master_thesis/sommer.php

Waarde, K. van der. 1999. The graphic presentation of patient package inserts. In Harm, J.G. Zwaga, Theo Boersema and Henriëtte C.M. Hoonhout, editors. *Visual information for everyday use.* London: Taylor and Francis, 75-81.

Waarde, K. van der. 2009. Measuring the quality of information in medical package leaflets: harmful or helpful? *Information Design Journal,* 16.3, 216 – 228.

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FAILURE TO MANAGE CONSTANT CHANGE

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ABSTRACT

This study examines patterns of system failure (communication, typographic, material, economic, maintenance) and the resulting workarounds in signs that are intended to communicate frequently changing information in the built environment. The observed failures and workarounds in the communication of ephemeral data and the accompanying narratives in the everyday or vernacular expose a need for designers to expand their practice beyond the design of individual client-driven solutions to engage more fully in the design and distribution of open-ended systems and default templates that are affordable, accessible and successfully accommodate customization and ongoing change. Control of the scale, design and content of changing messages rests in ongoing negotiations with local zoning boards and more specifically in a revised relationship between designers and message senders in the context of evolving digital technologies and practices that offer message senders increased control over content appearance and display. The templates and defaults used in the everyday communication of frequently changing information are often

driven by decisions made by sign manufacturers and programmers, resulting in communications that are built upon conventions that are often unexamined by message senders, who chose methods from a limited selection of manufactured options and increasingly enact template driven message sequences displayed on digital screens.

COMMUNICATION IN THE PHYSICAL ENVIRONMENT

Signs are an active communication medium in a public, shared environment. Even when a sign is located on private property, the message and method of conveyance are often viewed in a public context and become a concern to all who frequent the area. Signs are ubiquitous, so much so, that few of us are fully cognizant of the plethora of signs and messages that are being sent, unless the signs meet our need for action or necessary decision-making. Signs constantly present messages, but not all passersby become receivers of the messages offered by the sign's sender.

TECHNOLOGIES IN SUPPORT OF CHANGING INFORMATION

Changeable, or dynamic message signs—those designed to accommodate messages that change over time—typically have built-in methods facilitating change by the message sender, either on site or virtually, with minimal means or effort. Changeability incorporates strategies of reconfiguration or reuse of parts and materials, though another perhaps simpler way to achieve changeability is through disposability.

Historically, professional sign painters have played an integral role in the frequent update of signs in instances such as retail price posting. In sign painting, an apprenticed craft, the artists' labor is the primary method used to achieve change. Signs are painted on inexpensive materials and then replaced as needed, or key elements such as prices are painted again on an isolated part of a sign's surface. Mechanical devices and the advent of computer-driven technologies and advanced materials have replaced the labor of the commercial sign painter for the most part. In instances where a large percentage of the displayed content was changed daily, large-scale chalkboards were used to record continually updated stock transactions—numbers were simply erased and rewritten in permanently painted grids. The subsequent use of preprinted number panels, rearranged in slotted tracks, further organized the process of constantly updating prices. Mechanical flap signs were used to communicate frequently changing train schedules and interchangeable panels were hung in predetermined slots on sports stadium scoreboards. Most of the large-scale display of data that requires daily change is now presented on light emitting diode (LED) screens.

US patent applications document many innovations in changeable sign design and engineering as technologies and materials have advanced *(figure 1)*. Methods used over the years to accommodate changing messages are: rotation (dial), flip (split flap), roll, hinge, erasure and rewrite (coated wipe off surfaces), insertion (tracks, grooved board

and pockets), adherence or attachment (suction, tie, screw, rivet, hook, hook and loop, magnetic, snap, chemically adhered–tape or self-adhered vinyl, static cling) and electronic (electromechanical dot matrix, liquid crystal display, light-emitting diode (LED), magnetic particle, light projection, optical fiber, interactive touch screen, multi-touch screen, Bluetooth and radio-frequency identification–RFID) (Smitshuijzen, 2007, 71-73).

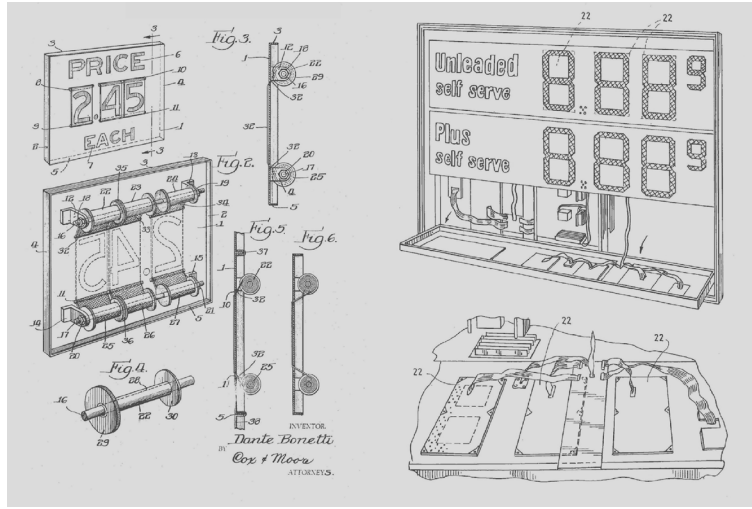

Figure 1
Two of many US patents detailing changeable sign methods
US patent 2118696, changeable letter sign, 1938
US patent 0246927A1, electronic sign, 2005

Future strategies include the incorporation of location-based data and wireless technologies. While data flows, such as time and temperature, have long been used to update signs on a continual basis, intelligent signs offer the ability to update in real time in response to audience data or presence, or environmental conditions. Hand held technologies and building-wide responsive systems are being conceived to incorporate textual or aural message channels as part of a seamless, responsive environment. In the future, implementation of technologies such as these may eliminate the need for a multitude of the individual signs in the built environment. But despite future projections for the potential of immaterial message technologies, many physical signs will likely require design, production and regulation for the foreseeable future.

HISTORY OF CONTROL IN THE BUILT ENVIRONMENT

Recent technical advances in LED technology have resulted in the increased economic viability of large-scale changeable screens and even building-scale responsive skins. Large-scale screens—long a part of urban entertainment zones such as Times Square in New York City and sports stadiums—are now being installed along many highways throughout the US, presenting an ever present, constantly changing, commercial image as part of the urban skyline. The increased viability of new technologies, especially those that blur the line between architecture and sign, have made it necessary to revisit existing local signage zoning regulations.

There is a long history of disagreements between civic groups and the sign and outdoor advertising industries regarding rights to free speech and government limitations on sign scale and location. The American Civic Association, City Beautiful and other civic groups worked to restrict urban outdoor advertising as a moral and aesthetic cause throughout the early 20th century. Their concern echoed the recognition that the American commercial audience was in motion with the "highway becoming the buyway." Outdoor advertising located on private property along highways, but "broadcast across public rights-of-way," (Gudis, 2004, 6) raised questions of control and the rights of multiple competing interests. Nature and scenic preservationists and reformers fought against outdoor advertisers, questioning the aesthetic value of the natural versus built environment. In 1965 the Highway Beautification Act brought legal legitimacy to sign control in the interest of improving visual character, eliminating and restricting many billboards along the US Interstate Highway System.

In 1976, the US Department of Housing and Urban Development sponsored an *Open Forum on Urban Signage* in Chicago to "provide a mutual marketplace for the exchange of competing ideas." The goal was to "provide local public officials, businessmen and businesswomen, and interested citizens with better data upon which to make sound decisions on the quality and character of their visual environment" (HUD, 1977, 1) The forum proceedings acknowledged that "in order to deal with the urban problem of sign proliferation along city streets, many cities have adopted graphic systems or enacted sign control ordinances" demonstrating that the "quality and character of the visual environment is an important local concern" (HUD, 1977, v).

City Signs and Lights: A Policy Study, developed by architects and planners and prepared for the Boston Redevelopment Authority and funded by the US Department of Housing and Urban Development (HUD) in 1971 claimed that "…an observer is often overloaded by messages competing for his attention or else his view is dominated and his privacy violated by advertising messages that are irrelevant to his purpose" (Carr, 1973, 9). The report, based on a two-year study of signs in Boston, acknowledged that signs were an undervalued resource for cities: "Public policy does not acknowledge the operation of private signs and lights as an information system, nor does it adequately reflect the system's real and potential value" (Carr, 1973, 118). The authors suggested a series of restrictions and systemization for both public and private signage, "…policies for private signs and lights should give priority to the needs of people living in and visiting cities over those of commercial senders of information, while protecting legitimate rights of identification" (Carr, 1973, 117).

Bringing an opposing perspective to the Open Forum on Urban Signage was a representative of *The Signs of the Times*, a sign trade magazine. One of the reference publications he provided, *Street Graphics: A Perspective* by Karen E. Claus, R. James Claus (1975), had been published in 1975 by Signs of the Times Publications as a response to the book *Street Graphics* (1971) by the American Society of Landscape Architects Foundation. The point of view offered by industry representatives at that time and then recently reiterated, was that if restrictive recommendations were enacted, "…planners, who have limited training or expertise in marketing, advertising, business management, First Amendment law, or transportation engineering, will be dictating to others how, when and where to speak, and even what to say" (International Sign Association, 2004, 46, 3).

Steven Izenour also made a presentation as part of the forum. Building on lessons from *Learning from Las Vegas,* a study coauthored with Robert Venturi and Denise Scott Brown (1972), Izenour emphasized the importance of learning from the vernacular landscape. "Our documentation of sprawl, strip, and city, in the context of one another and of the 19th century city, is part of a broader effort to understand American architectural taste and define the role of the architect in relation to it" (HUD, 1977, 26). In showing an image of a 19th century Eastern row house lined street, Izenour showed how over time each façade had become different. "Here we see that we allow the individual to do his own thing, to create variety and vitality in a part

of the city that without them would be a rather dull street" (HUD, 1977, 28). In showing a city street communicating through buildings and signs, Izenour stated, "The fact is that the city has always been a messy thing; and if it is to be a city, it probably has to remain a rather messy esthetic object. If we over-design-control this object, it really is no longer going to be the urban experience" (HUD, 1977, 31).

LEARNING FROM THE VERNACULAR

Venturi, Scott Brown and Izenour in *Learning from Las Vegas,* weighed change and permanence on the Las Vegas Strip. "The rate of obsolescence of a sign seems to be nearer to that of an automobile than that of a building. The reason is not physical degeneration but what competitors are doing around you." In their analysis of the Las Vegas Strip they determined that "the signs and casino faces are the most changeable" (Venturi, et. al., 1972, 34), referring to the entire sign as expendable compared with the buildings that supported the signs. But they did not directly address the even more readily changeable marquees that were significant elements of many of the casino signs they studied. In review of the Caesars Palace sign, they mention the "massive Miesian light boxes" with messages "in 1930s-style marquee lettering" (Venturi, et. al., 1972, 51). A diagram of the physiognomy of a typical casino sign, showed the marquee area as the "information" area, but this zone was not given further attention, as the applied imagery, symbol and identity were the focus of their exploration. A visual tour through the evolution of the Las Vegas Caesars Palace signs' changeable information zone or "massive Miesian light boxes" foreshadows the potential evolution of main street and highway signs *(figure 2).*

Figure 2
Caesars Palace marquee iterations

Learning From Las Vegas (LfLV) lists three major parties involved in sign control: Aesthetician: "…urban environment as medium of communication…Signs should enhance and clarify this communication." Sign Industry: "Signs are good, they're good for business…" and Legal Statutes: "If you'll just perform these minimal requirements we can collect a fee for the city and you gentlemen can continue your sender-message-receiver responses" (Venturi, et. al., 1972, 82).

The changeable light box marquees, a large percentage of the area of many of the casino signs studied in *LfLV*, suggests a fourth party with a role in sign control—the sender of the temporary message. Through traditional form and function associated with individual preordered letters and a track system—the message sender, presumably a casino or sign shop employee—was in charge of organizing new content on the tracks of the marquee and with each new show was in control (within constraints) of a large portion of the sign's message, content and appearance.

Venturi, Scott Brown and Izenour conclude, "Sources for modest buildings and images with social purpose will come, not from the industrial past, but from the everyday city around us, of modest buildings and modest spaces with symbolic appendages." If we reframe the 'symbolic appendages' or signs as 'marquee appendages' or as more recent digital technology allows, 'building as information screen appendages,' the promise of today's technology fulfills Venturi, Scott Brown and Izenour's conclusion that observed through light effects, "buildings are also signs," but now increasingly as an information area beyond the symbolic focus described by them (Venturi, et. al., 1972, 52).

In a more recent book, *Architecture as Signs and Systems: For a Mannerist Time,* Denise Scott Brown (2005) concludes,

> *The idea of the building as a shed with communication on it has influenced all our work but particularly our civic buildings. The changeable nature of light-emitting diodes (LEDs) permits quick shifts in communication, almost as events happen. Electronic banners have the same immediacy as flags or flowers.*

Further, Scott Brown isolates the issue of control as remaining critical, especially as the building surface becomes a digital screen:

> *A question for the future might be whether architects will be prepared to surrender the creative tasks of symbolic communication via architecture to the graphic artists who design the LED messages. Will we (or our clients) want this*

major element of the building to be expressed through a medium that is innately not subject to control?

But the control that is relinquished is not necessarily even given to a graphic artist or designer, but to a message sender using design templates to craft commercial or community-focused messages. In what ways can the design of the templates and limitations embedded within the technologies influence what is created when the screen or building is controlled by message senders, and projecting ahead to responsive buildings, even as modified by message receivers (or participants)?

REVISITING CONTROL IN THE BUILT ENVIRONMENT

Recently the sign industry and civic groups have engaged with new urgency in debates about restrictions and guidelines for the display of dynamic signs, specifically digital billboards. With new technologies and improved cost structures, outdoor advertising companies are moving to change static and tri-vision billboards to LED billboard screens. A series of reports authored by Scenic America, an advocacy organization formed with the goal of protecting "the scenic qualities of communities and roadways," promotes safety and aesthetics in an attempt to restrict what it sees as liberal misinterpretations of The Highway Beautification Act's unequivocal regulatory ban on flashing, intermittent and changing lights. Smaller video screen displays are increasingly seen throughout the everyday landscape, appearing in gas pumps and elevators, on taxi roofs, etc. Municipalities that already have sign codes in place to restrict flashing displays are in the process of determining whether these codes need to be amended to address new screen technologies.

In the early 20th century, changeable message signs were primarily visible as theater marquees—illuminated panels holding individual letters in tracks to announce the day's shows *(figure 3)*. Religious organizations frequently displayed smaller scale changeable message boards, incorporating service hours as well as narrative messages intended to welcome new members. Many businesses also adopted the practice of using stationary and portable changeable letter boards to announce hours or prices and initiate a dialogue with potential customers. Changeable message boards that are attached to commercial identification signs (perhaps with a digital time and temperature feature) are now frequently being converted to LED screen surfaces *(figure 4)*. The flat plane and rigid structure of the track system light box is being exchanged for a completely flexible, multi-state pixel grid.

Figure 3
Changeable marquee

Figure 4
Changeable message boards replaced with LED screens

LED screen signs can be programmed on site using template layouts or custom files to display images, data such as business hours and price specials and marketing messages or seasonal greetings. A selection of transitions between messages allows an active changeable message sequence. On a smaller scale, programmable one to three line high scrolling digital signs are also in use in storefront windows carrying hours and brief marketing messages.

A series of reports authored by Scenic America, an advocacy organization formed with the goal of protecting "the scenic qualities of communities and roadways," captures the view of many who would like to restrict such signs:

> *The visual character of a community—the appearance of its streets, neighborhoods and business areas—is essential to its long-term economic viability and helps determine how residents and visitors alike perceive it. Sign control is an integral part of improving visual character and quality of life. Nothing destroys the distinctive visual character of our communities faster than uncontrolled billboards and signs (Scenic America, 2007).*

The International Signage Association (ISA) has continued to publish reports that support their members' point of view,

> *No research or survey data is cited to support the notion that aesthetics are improved by restrictions on the quantity or size of signs, or design review of the content of signs. Consumers vote for their aesthetic preferences with their dollars, and retailers, who know their customers, typically seek to create a storefront aesthetic that will attract people to the store (International Sign Assocation, 2004, 47, 3).*

Many urban buildings and transit stations have long been covered with painted wall advertising and then as printing technologies improved, wrapped in branded large-scale advertisements. But there is an increasing pressure to revisit rules of control as screens of all sizes proliferate. An excerpt from a recent study on dynamic signage commissioned by Minnetonka, Minnesota with the League of Minnesota Cities reflects that the aesthetic value of dynamic, digital signs and billboards will likely be decided on a local level. They define a dynamic sign as

> *"A message being displayed using dynamic signage changes mechanically or electronically. This commonly includes any rotating, revolving, moving, flashing, blinking, or animated*

display and any display that incorporates rotating panels, LED lights manipulated through digital input, or any other method or technology that allows the sign face to present a series of images or displays" (SRF Consulting, 2007, 1).

Signs that are changed manually are considered static signs.

In the report, the positive aspects of dynamic signs are listed as the ability to transmit several times the information including advertising, holding the viewers attention for a longer period. The negative aspects listed are that dynamic signs are distracting to drivers and can be linked to traffic accidents with driver distraction as the underlying cause. Another negative aspect of dynamic signs cited in a Mankato, Minnesota City of Manager's Report is "that many citizens find dynamic signs aesthetically unappealing. This may vary considerably from community to community, as each will have its own values and standards concerning aesthetic quality" (Mankato, 2009, 2).

In a summary report on regulating dynamic signage, The League of Minnesota Cities suggests a variety of macro-level approaches regarding dynamic signage: From calling for a complete or near-complete ban that does not allow dynamic signs at all, to encouraging dynamic signs. The report points out that "Some communities like the clean, new look of dynamic signs and encourage them to remove old blighted and poorly maintained signs" (Merwin, 2007, 3).

Should a city decide to regulate dynamic signage, six main aspects that regulations can address are: 1) duration of messages, speed of changeover, 2) motion, animation and video, 3) brightness, 4) sign placement and spacing, 5) size of signs and 6) text size and legibility (Merwin, 2007). The increased number of variables subject to control may help manage taste, but engaging designers in the process of creating standard uses within the dynamic systems may have more impact on improved communication—through well designed standards—than municipalities pursuing additional code restrictions.

AN OVERLOOKED INFORMATION CHANNEL

Many of the sign regulation studies of the 1970s also determined that on-premise advertising and business identification was communication in need of control. "Roadside billboards, for instance, have been widely criticized, but the fact is that on-premise business signs are often even more offensive than billboards" (Ewald, 1971, 4).

The negative effect of street graphics that overload the visual sense is expressed as "…the viewer actually sees less, not more." Planners,

in proposing general rules for controlling street graphics, reviewed examples of European city codes, where a recommended reliance on the taste and expertise of an educated observer's aesthetic sense was suggested.

> *If the entire society is not to be forcibly subjected to the lowest common denominator of public taste, expert assistance is needed. Unlike radio and television, street graphics cannot be turned off by those who find them offensive; a billboard cannot be flipped over like advertising pages in a magazine. The presence of street graphics in the environment is relentless, and therefore the people who are consciously offended by inappropriate street graphics deserve consideration, even if they are a minority (Ewald, 1971, 36).*

Most sign design guides and code policies recognize a spectrum of scale change for information intended for those in cars on highways, on slower speed roads and for pedestrians. A multitude of signs are located in both municipal and commercial environments, providing business hours, prices and other frequently changing information in support of the everyday exchange of goods and services. The vast quantity of the signs affixed to building surfaces are secondary in size and importance to the larger scale building identification and marketing signs which are often the focus of business expenditures and zoning code negotiations. But the smaller scale, everyday channel of communication also creates a level of visual overload and can have a substantial impact on the physical experience of public environments.

Regulations have attempted to limit either the quantity of signs or the percentage of sign coverage. Recommendations also note that numerous stickers and sale signs are unattractive and obscure product and shop activity. But despite far reaching recommendations generated in the 1970s, delineating possible restrictions and systematized communication channels, on-premise signs and storefront windows have been subjected to little restriction in the US, other than a limit on flashing signs and illuminated awnings, which are considered illuminated sign channels by some municipalities. Issues of First Amendment rights have been tested and free speech rights have been protected, especially for on-premise signs.

Dynamic digital signs have been widely implemented for the display of changing information in large-scale municipal public transportation networks. But the economics of small business suggest that pedestrian level commercial information will not be transitioned to LED screens or seamless, responsive environments in a simple, consistent manner,

as there are many competing message senders rather than a single municipal authority determining best communication strategies.

COMMERCIAL ENVIRONMENT IN FLUX

Consumer culture encourages the production of change, not only as a cultural value but also as an economic business necessity, hence uses of the commercial built environment evolve frequently. The recent economic downturn and sustainability movements have resulted in the reduced retail exchange of products as well as personal services. Temporary stores that open and close with seasonal opportunities and variable services add to ongoing flux in the commercial use of the built environment. If each individual storefront is inconsequential and subject to change, then all of the ephemeral signage located within each storefront is all the more unstable.

If we examine the commercial information channel at a pedestrian level as a dynamic system, the observed failures and workarounds suggest potential avenues to expand design practice beyond the design of individual client-driven solutions, to an increased engagement in the design of open-ended systems and default templates that are affordable, accessible and successfully accommodate ongoing change of data and accompanying narratives.

A visual survey of many storefront neighborhoods suggests that a new business needs at minimum four generic signs: a vinyl window identification sign (or awning), an address sign, an LED 'open' sign and a business hours sign *(figure 5)*. The restaurants, convenience stores and personal service businesses occupying many storefronts are frequently operated with a very low overhead. The generic signs used by these businesses are often acquired through a minimal purchase from a hardware store, office supplier or sign shop, with the intent of providing immediate communication of the message sender's business viability. The amount of potentially changeable information to be communicated varies, but the signs used are typically not considered as a system and their appearance and prevalence in the urban fabric informs a good part of the pedestrian level communication channel in many cities and main street settings.

Figure 5
Off-the-shelf storefront signs

INCONSEQUENTIAL BUT PREVALENT FAILURES

In addition to the storefront architecture and neighborhood socioeconomic climate, image, typography and the materiality of signs all project subtle clues about a place of business. There are expected differences in the quality of signs between large corporate chains, established higher-end businesses and small individual retail concerns. Signs may perform multiple sets of communication functions–identify, inform, advertise, promote a business image and enhance or decrease neighborhood aesthetics, often simultaneously. Typical information that is communicated at an entry to a business include hours of operation, seasonal hours or other special extended periods, holiday hours and all other extenuating hour changes necessitated by that holiday, notes of apology and well wishes and emergency closing notices. In a market driven society, simple data, such as the cost of goods and services and hours of operation, change frequently and are often accompanied by narratives and contingencies that mirror nuanced human and business activities. Sign systems that are accessible to small businesses through minimal effort or cost, often fail to provide adequate flexibility and ease of maintenance; they are strained by everyday, constantly changing communication needs. The resulting system failures and workarounds are only marginally

communication failures, as key information is imparted regardless of the typographic and material system failures. Ad hoc modifications within the commercial information channel at a pedestrian level are so prevalent that we do not even notice the workarounds and unquestioned acceptance of conventions, or we accept the failures as a reflection of the reality of the current commercial condition.

Rapidly changing economic conditions have sparked fuel price swings, repeated markdowns and reduced hours. In 2008, US retail gas prices went through rapid price swings, reaching record highs above $4.00 a gallon. Added to the usual seasonal price and hour changes, these conditions pushed sign systems to a failure point commented on by the news media: "When prices passed $4, many stations ran out of 4s, and managers improvised by photocopying signs or stenciling numbers by hand" (Belson, 2008). As laws in many municipalities regulate the display of gas prices, station owners were required to address their sign inadequacies with some urgency. Rapid price changes in gas and cigarettes resulted in a failure to display change seamlessly—missing, mismatched and hand drawn numerals in gas price signs were a visual reminder of a breach in normalcy. Many independent gas station operators maintain older signs that use flip letters or individual letters held by magnetic or plastic tracks. In anticipation of ongoing volatility in gas prices, sign companies have marketed easy retrofit kits allowing gas prices to be displayed digitally within the existing sign framework *(figure 6)*.

Mechanical devices and systems designed to accommodate change break down for many reasons, including a lack of message sender motivation to maintain things as designed. Often parts and letterforms needed to maintain these systems must be stored and then retrieved for later use. There are also limitations imposed by the number of available letterforms provided or even the number of digits allowed. Adhesive based systems often fail because removal appears to be difficult, either too time consuming or due to a lack of appropriate solvents. The result is defunct information that requires masking or layering, resulting in an everyday palimpsest that exposes failed efforts to remove or hide past states.

Changing economic conditions, in addition to the typical seasonal and holiday disruptions, result in ongoing changes in business hours. As a result many information signs, even those designed to be changeable, fail to seamlessly keep pace. Workarounds such as handwritten patches taped to grooved message boards, vinyl times partially scraped off and handwritten numbers squeezed in remaining spaces are prevalent. Laser printed revised hours taped over existing hours, and amended times added next to the original hours were observed *(figures 7-22)*. Table 1 provides an analytical overview.

Figure 6
Changing price signs

Figure 7
Binary state signs–open or closed

Figure 8
Hand painted, hand written signs

Figure 9
Business hour signs, grid format

Figure 10
Business hour signs, grid format

Figure 11
Business hour signs, grid format

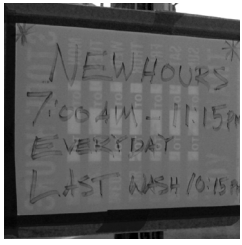

Figure 12
Business hour signs, grid format

Figure 13
Business hour signs, grooved board

Figure 14
Business hour signs, track

Figure 15
Business hour signs, decal grid format

Figure 16
Business hour signs, vinyl letters

Figure 17
Business hour signs, amended

Figure 18
Business hours signs, special note

Figure 19
Business hours signs, holidays

Figure 20
Business hours signs, holidays

Figure 21
Business hours signs, digital

Figure 22
Address numbers, accessible via convenient distribution system

Table 1 Analysis of figures 3 through 22

Figure #	Condition	Failure	Workaround
3	**Changeable marquees** • Require ongoing access to individual letters	• Lack of access to appropriate letters • Uneven letter and word spacing	• Hand-altered substitute letters
4a	**Changeable message boards** • Use strip and individual letter technology similar to early marquees • Require ongoing access to individual letters	• Lack of access to appropriate letters • Uneven letter and word spacing	• Hand-altered substitute letters
4b	**LED and plasma dynamic screens** • Increasingly replacing changeable message boards	• Multiple states delivered over time; viewer needs to invest time to see entire message cycle • Typographic illegibility and distortion created by gratuitous transition phases	
5	**Off-the-shelf storefront signs** • Small business predominately use off-the-shelf signs to communicate changing information at storefront level	• Based on unquestioned conventions of prior technologies • No consideration of signs as a system • Limited choice at low end of sign market	
6	**Changing price signs** • Communicate rapidly changing prices	• Inadequate quantity of numerals	• Hand-altered numbers, patches, mismatched letter forms, qualifying notes • Retrofit kits offered to convert mechanical systems to digital
7	**Binary state open/closed signs** • Communicate state at current point in time; open versus closed • Pull-down grill is ultimate closure • Paper or plastic flip sign with closed/open • Time of reopen set with dial or clock hands • Electronic signs; 'on' state signifies open and 'off' means closed	• Success of flip depends on user discipline to display proper position • Electronic 'open' message is visible even when turned off, can be counter to a daytime closed state of business	• Clock hands and dials appear to be hard to maintain, resulting in permanent alterations • Apologies such as 'sorry' often added
8	**Hand painted or hand written signs** • Professional sign painter increasingly replaced by an untrained user marking on erasable surfaces • Ephemeral nature allows on-location, instant updates with minimal effort • Information organized/emphasized in any method	• Handwritten signs easily erased by mistake • Lack of clarity due to palimpsest of iterations	• Creative customization (dependant on end user's creative skills and patience)
9-12	**Business hour signs, grid format** • Plastic panel with hours re-writable or decal applied • Hours presented in a 7 x 2 slot grid representing one week	• Problems adhering hour decals consistently • Grid forces repeat of unchanging hours • Contrast of grid and background color can overwhelm hour content • Some sign templates have AM and PM column headers; not pertinent for all • Minimal room for additional information	• Repeated need to change times results in illegibility • Lack of access to decals results in patches applied for changed hours • 'Closed' repeated or stretched across grid slots • Hours staggered to reduce repetition • Larger numbers used to cover 5 x 2 area to reduce repetition • Multiple hours squeezed into one slot • Custom grid or list created to show complex multiple daily opens/closes • Sign flipped and hours hand-written on reverse
13	**Business hour grooved board signs** • Individual letters allow flexibility in message content, placement • Individual letters allow custom business hour organization, reducing repetition	• Lack of access to appropriate letters • Uneven letter and word spacing • Broken or mismatched letters • Handwritten markings permanently alter changeable system	• Creative reuse of letters, numbers and abbreviations • Hand-altered substitute letters • Patches and handwritten markings added

Figure #	Condition	Failure	Workaround
14	**Business hour signs, track** • Individual letters allow flexibility in message content, placement • Individual letters allow custom business hour organization, reducing repetition	• Inadequate number of letters • Uneven letter and word spacing • Failure of tracks to hold letters or strips in place	• Handwritten markings added to permanently alter changeable system • Patches and notes ignore changeable track framework
15	**Business hour signs, decal grid** • Adhesive vinyl sheets with time decal patches adhered directly to glass • Hours presented in a 7 x 2 slot grid representing one week • Majority of decals are provided by corporate or related supplier; adding a branded message	• Problems adhering hour decals consistently • Adhesive is hard to remove, requires solvent and/or razor to remove • Same failures as other 7 x 2 grid solutions	• Defunct sign retained even when a new sign with revised information is added • Incorrect information scraped away and paper patches applied
16	**Business hour signs, vinyl** • Typically adhered directly to glass • Allows flexibility in message content and information grouping and placement • Custom letter forms provided on an applicator sheet for easy application • Vinyl cut based on custom files at a sign shop or through web interfaces that allow customization of fonts, sizes and information using template designs; Signazon.com is typical of web interfaces offering customizable vinyl signs	• Change in hours requires replacement of entire sign or patching	• Individual replacement numbers and letters added • Repeated paper patching added showing seasonal time changes • Incorrect information scraped away to leave area blank • Add the word 'CLOSE' in place of a specific closing time
17	**Business hour signs, amended** • Temporary sign added to amend or supercede the original more permanent hours already on display	• No method in existing system for additional temporary information • Two sets of conflicting hours posted adds confusion	• Signs added showing new hours • Signs added showing seasonal hours
18	**Business hour signs, special note** • Sign added to highlight special hours	• No method in existing system for additional temporary information • Hours become a marketing message	• Approximate messages added; 'Sish' or 'hours by chance'
19-20	**Business hour signs, holiday** • Temporary holiday hours added to amend or supercede the original more permanent hours already on display • Hand drawn or created digitally and laser printed (templates and clip art and photos are sometimes used)	• No method in existing system for additional temporary information	• Signs added using materials at hand such as placements or cardboard pizza circles • Signs added using colors and images specific to holiday • Signs added with an apology or a well wish for missed customer • Signs added to clarify open state despite a holiday
21	**Business hour signs, digital** • Programmed to display hours and multiple messages with customizable transitions	• Risk of back-end code display such as 'memory full' or 'start' • Multiple states delivered over time; viewer needs to invest time to see entire message cycle • Typographic illegibility and distortion created by gratuitous transition phases	
22	**Address number** • Address numbers, accessible via convenient distribution system • Typically applied once for non changing information such as address	• Unclear whether to install on angle, staggered or as italic letterforms	• This product is included as an example of a system that has achieved ubiquitous distribution and application. In designing future materials and tools that message senders use to communicate everyday changeable messages, distribution and accessibility are key considerations.

STREET LEVEL OBSERVATIONS

The observed failures of signs to seamlessly accommodate change is part of a larger design failure to address the creation of accessible products, rather than practicing primarily as service providers in the creation of custom solutions. If designers desire more influence on the visual and textual built environment, we need to engage the cultural habits, conventions and economic conditions that message senders face when they attempt to communicate with receivers in the physical world. The gathered and examined visuals of this study can best be summed up as the failure of designers to find a way to participate fully in the generation of inexpensive or free templates, inventive material systems or innovative distribution methods for everyday information rich, changeable communication.

This is not a rigorous study that included an interview process or comprehensive study of message senders' needs and concerns. But it is a poignant visual accumulation that may help designers look more closely at the limited means with which a multitude of message senders communicate changing information in an attempt to genuinely connect with their customers (or message receivers) and pursue commercial or service success. Visuals collected in this study are based on photographically recorded observation by the author, primarily in US urban/suburban storefronts and strip malls as well as adjacent small town areas in the Boston, Chicago and San Francisco areas. Observation in Vancouver, BC revealed many of the same conditions. These areas were accessible to the author and for the purposes of this essay will be considered typical of similar US locations.

THE VERNACULAR IN DIFFERENT LIGHT

Graphic design has long celebrated the vernacular as a stylistic influence. M&Co's 1980 era design of various print and sign communications for the New York City restaurant Florent, incorporated existing on-site grooved changeable menu boards that were used to display frequently changing menu items and political and meteorological messages. But a greater influence on other designers was the stylistic adoption of the failed vernacular and celebration of the mismatched and workaround use of letterforms used in the Florent restaurant identity and font *(see figures 23 and 24)*.

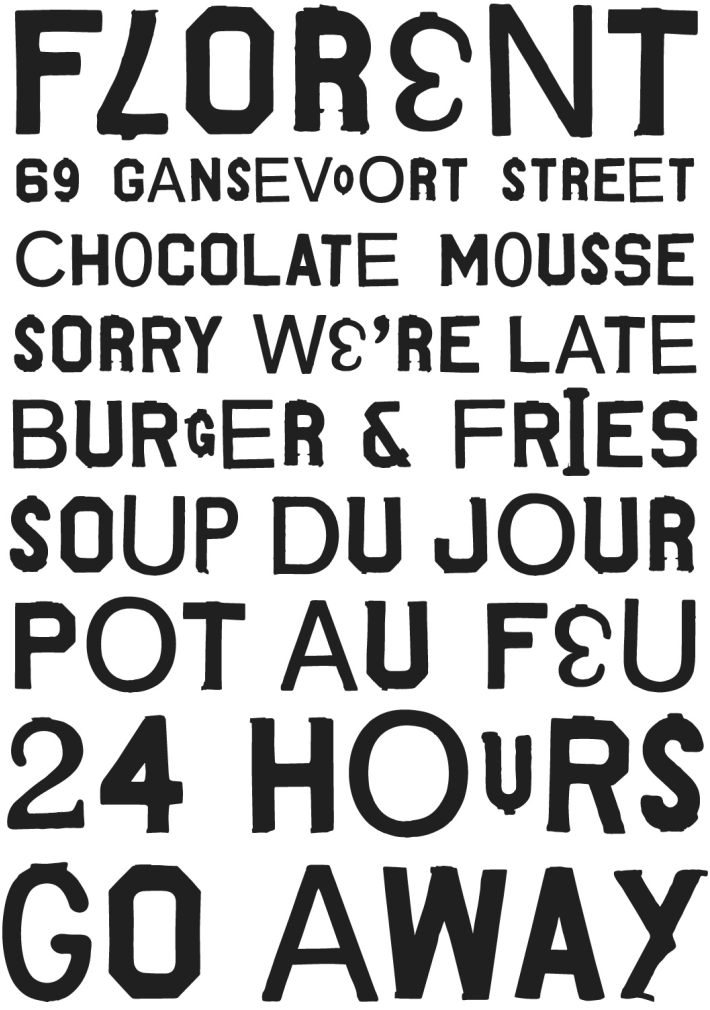

Figure 23
Florent vernacular restaurant signage

Figure 24
Florent vernacular restaurant signage

Lev Manovich (2008) in the Practice of Everyday (Media) Life extends Michel de Certeau's theory of the everyday spatial practice of walking in the city as a tactical writing or form of everyday expression, incorporating practices of networked social media. Manovich suggests that the general ideas he presents provide "…an excellent intellectual paradigm available for thinking about the vernacular culture." Further that "people build their worlds and identities out of these readily available objects by using different tactics: bricolage, assembly, customization…"

If we define the vernacular textual landscape as more than a stylistic resource for designers, but instead as a means for individuals to participate in the ongoing creation of artifacts in support of their exchanges with the world, how does that change the designer's relation to the artifacts, systems of distribution and to the messages of senders and receivers? How can we have impact on the distorted typography and transition defaults viewed in quickly proliferating dynamic screens? Are designers interested in engaging meaningfully in the design of templates for use by many, rather than exclusively crafting one-of-a-kind client-driven solutions? What role does the designer play in taking responsibility for creating systems for a populace that may or may not recognize room for improvement?

DESIGNERS' RESPONSIBILITY FOR THE BUILT ENVIRONMENT

Organizations such as Design for Democracy (2009) and its suggested improvements for clear signage as part of a service design model, suggest a clear path to bettering our voting experience, implementing "…design tools and thinking to increase civic participation." Other groups such as the International Urban Screens Association (2009) look for ways that commercial outdoor screens in public spaces can serve as a platform for "…user-generated civic and cultural expression, community building, multiculturalism and public engagement in issues related to social, cultural and environmental sustainability."

In the light of these broad social initiatives, it is hard to justify design engagement with the vernacular tools of commerce as any more than an extension of Philippe Stark's stated desire to bring design to the masses, "imbuing everyday objects with style, elegance and magic" through inexpensive products sold through his arrangement with Target (2002) stores. But the observed everyday failures of physical systems that message senders use daily to communicate in the built environment suggest the need for an innovative rethinking of tools of information dissemination. A model of proactively designed tools offered free or at negligible cost, could be made affordable by building

on Google's model of free internet tools or the automated public toilets that are free to any city willing to allow the continual display of ads. Are there other extensions of open source methods that could influence the vernacular without increasing advertisement streams? Digital communication tools accommodating customization are widely available for web sites and blogs. A selection of template formats guide the creation of books at sites such as Blurb, vinyl letters at Signazon, and personal signs at Pullsign.

Peter Hall (2009) in the essay, A Good Argument in *Metropolis* Magazine, presents criteria for evaluating design arguments today in the troubled economic, ecological and political climate of the early 21st century,

> *Arguably, these criteria provide an ethical framework for evaluating design so that the long-established yardsticks—design that is functional, beautiful, enduring, well made—are offset by values like affordability, accessibility, ergonomic strength, social benefit and necessity and emotional resonance.*

A critique of everyday changeable messages could easily result in a dismissal of this area of practice as inconsequential noise, devoid of taste and a decision to wall off the vernacular from professional design practice. But the observed failures suggest that affordability, accessibility, necessity and even emotional resonance (through message sender's accompanying narratives) are criteria met by the existing tools. Thus the challenge is to determine if there is room to increase functional and typographic organization and question established conventions in order to flexibly influence a wider part of the built environment through the design of improved systems for message senders to use in the creation of their everyday communications.

REFERENCES

Belson, Ken. 2008. A Shortage at the Pump: Not of Gas, but of 4s. *New York Times,* July 15.

Blurb. http://www.blurb.com/. (Accessed July 1, 2009).

Carr, Stephen. 1973. *City Signs and Lights: A Policy Study*. Cambridge, MA: MIT Press.

Claus, R. James and Karen E. Claus. 1975. *Street Graphics: A Perspective.* Cincinnati, OH: Signs of the Times.

Claus, R. James and Karen E. Claus. 1976. *Signage: Planning Environmental Visual Communication.* Palo Alto, CA: The Institute of Signage Research.

Claus, R. James and Susan L. Claus. 2001. *Unmasking the Myths about Signs: Learning to Use Signage as a Planning Tool for Intelligent Community Development.* Alexandria, VA: International Sign Association.

de Certeau, Michel. 2002. *The Practice of Everyday Life.* Berkeley, CA: University of California Press.

Design for Democracy. AIGA. http://www.aiga.org/content.cfm/design-for-democracy. (Accessed July 1, 2009).

Ewald, William R. and Daniel R. Mandelker. 1971. *Street Graphics and the Law.* Washington, DC: American Society of Landscape Architects Foundation.

Gudis, Catherine. 2004. *Buyways: Billboards, Automobiles, and the Amercan Landscape.* New York, NY: Routledge.

Hall, Peter. 2009. A Good Argument. *Metropolis Magazine,* March. http://www.metropolismag.com/story/20090318/1-good-argument. (Accessed July 1, 2009).

International Sign Association. 2002. The Value of Signs for Your Community. *Signline,* 37, 1-8. http://www.signs.org/Portals/0/docs/signline/signline_37.pdf. (Accessed July 1, 2009).

International Sign Association. 2004. Street Graphics and the Law: A Flawed Perspective, Part 1. *Signline,* 46, 1-8. http://www.signs.org/Portals/0/docs/signline/signline_46.pdf. (Accessed July 1, 2009).

International Sign Association. 2004. Street Graphics and the Law: A Flawed Perspective, Part 2. *Signline,* 47, 1-8. http://www.signs.org/Portals/0/docs/signline/signline_47.pdf. (Accessed July 1, 2009).

International Urban Screens Association. http://www.urbanscreensassoc.org/iusa09/?page_id=145/ (Accessed July, 2009).

Mankato, Minnesota. 2009. City Manager's Report Item No. 9.4, June 8. http://www.mankato-mn.gov/upload/images/9.4%20Agenda_Recommendations.pdf. (Accessed July 1, 2009).

Manovich, Lev. 2008. The Practice of Everyday (Media) Life. From Mass Consumption to Mass Cultural Production. *Critical Inquiry,* 35.2, 319-331.

Merwin, Paul. 2007. Risk Management Information, Regulating Dynamic Signage. St. Paul, MN: The League of Minnesota Cities. http://www.lmc.org/media/document/1/regulatingdynamicsigns.pdf. (Accessed July 1, 2007).

Minnetonka, Minnesota. 2007. City Council Agenda Item #14, an ordinance regulating dynamic signs, meeting of June 25. http://www.eminnetonka.com/news_events/projects/show_project.cfm?link_id=Dynamic_Signs_Ordinance&cat_link_id=Planning. (Accessed July 1, 2009).

PullSign http://www.pullsign.com/printyard.html. (Accessed July 1, 2009).

Scenic America. 1996. Billboard Control: Fighting Visual Pollution. May. http://www.elpasotexas.gov/development_services/meetings/cpc0405071330/Item%2033%20Billboards.pdf. (Accessed July 1, 2009).

Scenic America. 2007. Billboards in the Digital Age: Unsafe (and Unsightly) at Any Speed. *Scenic America Issue Alert 2:* Electronic Signs. www.scenic.org/pdfs/eb.pdf. (Accessed July 1, 2009).

Scenic America. 2007. Position Paper Regarding the Propriety of Permitting Digital Billboards on Interstate and Federal-Aid Highways Under the Highway Beautification Act. July 5. http://www.scenic.org/pdfs/ppdigitalbillboards.pdf. (Accessed July 1, 2009).

Scenic America. 2008. A Vision for Defending America's Communities and Landscapes. http://www.scenic.org/pdfs/SA one page vision overview 2008 version copy WEB res.pdf. (Accessed July 1, 2009).

SRF Consulting Group, Inc. 2007. Dynamic Signage: Research Related to Driver Distraction and Ordinance Recommendations. Minnetonka, MN: City of Minnetonka, June 7. http://www.lmc.org/media/document/1/signstudy.pdf. (Accessed July 1, 2009).

Signazon.com. Designer. http://www.signazon.com/Designer/Designer.aspx?id=717. (Accessed July 1, 2009).

Smitshuijzen, Edo. 2007. *Signage Design Manual.* Baden, SW: Lars Muller Publishers.

Target press release. 2002. http://www.prnewswire.co.uk/cgi/news/release?id=82845. (Accessed July 1, 2009).

United States Department of Housing and Urban Development. 1977. *Proceedings of the Urban Signage Forum,* April 22 and 23, Chicago, IL and Washington, DC: US Government Printing Office.

Venturi, Robert, Denise Scott Brown and Steven Izenour. 1972. (Revised edition 1977.) *Learning from Las Vegas.* Cambridge MA: MIT Press.

Venturi, Robert and Denise Scott Brown. 2004. *Architecture as Signs and Systems: For a Mannerist Time.* Cambridge, MA: Harvard University Press.

PHOTO CREDITS

Figure 2
Top left: Caesars Palace, Las Vegas, two-panel changeable marquee
Photo: Pauline Reyes, 1968,
http://www.flickr.com/photos/tedmills/406049301/

Top right: Caesars Palace, Las Vegas, extended sign, single-panel changeable marquee,
Photo: Gary L. Friedman,
http://www.friedmanarchives.com/Las%20Vegas/pages/009640-R3-1.htm

Mid left: Caesars Palace, Las Vegas, early LED screen sign
Photo: Ron LaRosa, 1987,
http://www.flickr.com/photos/vegasrob/2535716432/

Mid right: Caesars Palace, Las Vegas, single-panel changeable marquee,
script breaks limitations of marquee track system, used for long running act

Bottom left: Caesars Palace, Las Vegas, two-panel LED screen sign
Photo: Ron Campbell (RonDeeView),
http://www.flickr.com/photos/rondeeview/1615795791/

Bottom right: Caesars Palace Las Vegas, changeable marquee,
used for community message immediately after September 11, 2001
Photo: Stimpson
http://www.flickr.com/photos/stimpson5000/196862973/

Figure 23
Florent restaurant font
Design by Kevin Dresser at Dresser Johnson

AUTHOR NOTE

Ann McDonald is an assistant professor at Northeastern University in Boston. She studied at the Institute of Design in Chicago, holds a BFA from the University of Washington and a MFA in graphic design from Yale University. Her research and design practice examine and encourage interaction and participation in order to foster increased understanding across disciplines and cultures. Interactive design projects for clients such as The Boston Symphony Orchestra, The New England Aquarium and The National Health Sciences Consortium offer access to complex topics and explore the relationship between narrative and information space. Her research also examines the tension between public and private uses of dynamic screens.

IBN BATTUTA MALL: EDUTAINING THE WORLD?

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Lee, 104-125

ABSTRACT

Nakheel, a Dubai World Company has created the world's largest themed mall based on the narrative of Ibn Battuta, a 14th century Muslim explorer whose world travels are well documented. The Ibn Battuta Mall is located in the city of Dubai in the United Arab Emirates and utilizes a communication strategy called edutainment: a neologistic portmanteau whose goals are to educate and entertain an audience. Through the use of diffusion theory and its five innovation attributes, this paper recognizes that the architects and designers of the Ibn Battuta Mall have placed edutainment goals into the context of a mall expressing a predominantly Arab and Muslim identity. This paper argues that the mall has failed to achieve many of its educational goals and has replaced historical fact and authenticity in favor of expressing a message of opulence and social prestige, which defines the mall as a place of commerce rather than a stimulating learning environment.

Exhibition design grew in meaningful complexity and social significance between 1950 to late 1970 partly due to the seminal work of Charles Ormand Eames (1907-1978) and Ray Kaiser Eames (1912-1988). Ray and Charles Eames produced exhibitions that began with displays for designed objects: Good Design at the Chicago Merchandise Mart (1950) and continued into thematic exhibitions such as The Textiles and Ornamental Arts of India (1955) and The World of Franklin and Jefferson (1975-1977). The Eames also created the longest running, permanent, corporate sponsored exhibition: Mathematica: A World of Numbers and Beyond commissioned by IBM (1961). Through text, image, illustrations and interactive displays the Eames communicated complex historical, cultural and scientific ideas in a captivating manner. Pat Kirkham writes, "Despite the fact that the exhibitions were packed with information, artifacts, and images, a great deal of care was taken to make them accessible. This was done not by diluting or oversimplifying the content but by making learning interesting and fun" (Kirkham, 1995, 263).

The Eames' intentions to create both educational and engaging exhibitions has been captured by a new catch phrase "Edutainment," a neologistic portmanteau combining the words education and entertainment, defined as an attempt to educate and amuse. Edutainment is used to describe a new viewing experience for museum visitors. Edutainment designers are identified as intermediaries between curators, corporate sponsors and media savvy audiences. Peter Hall in a *New York Times* article focused, on the new "dazzling" museum claims: "The edutainment boom has, in turn, given rise to a new generation of exhibition designers, the tech-smart, theatrically minded visionaries and pragmatists who specialize in bringing objects, ideas and even corporate philosophies to life" (Hall, 2001). Museums have also entered into retail and commercial spaces in order to increase revenue and attract larger audiences. Helmut K. Anheier and Stefan Toepler note, "The main thrust of commercial activity has been on retailing and merchandising, as museums not only increased store space but also moved offsite to shopping centers and malls" (Aheier and Toepler, 1998, 239). Malls and shopping centers have become new venues for the collections of museums and educational exhibitions (McLean, 1997, 117), merging the edutainment goals of a museum with the commercial goals of a mall.

This paper focuses on the largest and most significant edutainment project located in a shopping complex: the Ibn Battuta Mall in the city of Dubai in the United Arab Emirates. Nakheel, a Dubai World Company, has created the world's largest themed mall and the most visited mall in Dubai with over ten million visitors a year (Makintosh, 2008), based on the journey of the adventurer and scholar, Ibn Battuta (1304-c.1369). Ibn Battuta was born in 1304 and at the age of twenty-one traveled three times the distance of Marco Polo and documented his travels in one of the longest and most notable travelogues ever written. The historian Albert Hourani argues that in comparison with other forms of travel writing, Ibn Battuta's stories "…were the most far-reaching, and conveyed a sense of the extension of the world of Islam and the variety of human societies within it" (Hourani, 1991, 201).

MTE (Marketing Themed Environments) based in Dubai is the consultancy team responsible for the design and art direction of the Ibn Battuta Mall. Ludo Verheyen, director of MTE Studios in a press release stated,

> *Our goal in the case of our client Ibn Battuta Mall is to combine entertainment with education, whereby the Mall becomes the first 'Edutainment' Mall in the World. The introduction of 'edutainment' in Malls is quickly evolving into a new trend, making a regular shopping experience a more interesting and exciting one" (Stensgaard, 2008).*

Verheyen's statement reveals a new communication strategy for malls and introduces designers to a far more commercial environment for their work outside of traditional museums and exhibition spaces.

This article examines and evaluates many of the design decisions made by the architects, exhibition designers and individuals responsible for the visual presentation of the Ibn Battuta Mall. Diffusion theory, primarily the work of Everett M. Rogers (Rogers, 2003) will be used to define the use of edutainment goals in a Middle Eastern mall as an innovation: "…idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, 12). This article will apply Rogers's descriptions of the five attributes of an innovation (Rogers, 2003, 219-266) to evaluate whether or not edutainment in this mall will lead to adoption: "…a decision to make full use of an innovation as the best course of action available" (Rogers, 2003, 21). The architects and designers of the Ibn Battuta Mall have inserted ideas and information into the familiar context of a mall, taking on the roles of historians and curators of a shopping complex that also serves as a museum and place of

entertainment. Linking edutainment goals to this mall are ultimately an attempt to express an Arab and Muslim identity for the citizens of the United Arab Emirates; communicating this as well to residents of the country and visitors to the mall. The use of historically familiar and ornate designed elements in the mall supports the adoption of the shopping complex, but consumption of the "retailscape" does not lead to the attainment of historical knowledge and cultural understanding. Opulence and novelty have replaced historical fact and authenticity in the mall. Designers of edutainment projects such as the Ibn Battuta Mall should embrace a larger role in the design process; one that requires a high level of cultural sensitivity, the need for historical accuracy and a critical examination of how visual and information resources are applied.

DIFFUSION THEORY

There are many communication theories that may be used to define and evaluate edutainment. These theories include: persuasion theory (O'Keefe, 2002), the theory of reasoned action (Ajzen and Fishbein, 1975, 1980), social learning theory (Rotter, 1954), (Bandura, 1977, 1986) and diffusion theory (Rogers, 2003). Diffusion theory was developed by a number of disciplines and explains "…the flow of information, ideas, practices, products, and services within and across cultures and subcultures, or markets and market segments" (Gatignon and Robertson, 1985, 849). This article will focus primarily on diffusion theory because of its historical significance to educational research and the evaluative importance of edutainment as an innovation.

Educational diffusion studies can be traced back to the 1920s to the work of Dr. Paul Mort at Columbia University's Teacher College. Mort studied the innovative benefits associated with local school control of financial decisions (Mort, 1953, 1957). After Mort's death educational diffusion studies fell into decline, but rose in significance during the 1970s as a result of the diffusion research conducted by Paul Berman and Milbrey W. McLaughlin (Berman and McLaughlin, 1974, 1975, 1978). Berman and McLaughlin conducted research that evaluated federally supported education programs and their dissemination of innovations on a local, state and federal level. Current diffusion research in education has focused on the spread of educational innovations on an international scale such as the global spread of kindergartens (Wollons, 2000).

This article frames the goals of edutainment in a shopping complex located in the Middle East as an innovation. Rogers claims that the "newness" of an innovation is not just inclusive of "new knowledge" but also "may be expressed in terms of knowledge, persuasion, or a decision to adopt" (Rogers, 2003, 12). Ibn Batttuta Mall promotes the idea that the mall is "…revolutionizing the retail and entertainment experience in Dubai" (http://www.ibnbattutamall.com) by educating and entertaining patrons in the mall while they shop in its themed courts. The Ibn Battuta Mall is separated into six thematic zones that are referred to as courts by the mall's architects and designers. The courts represent some of the countries or regions Ibn Battuta explored: China, India, Persia, Egypt, Tunisia and Andalusia. The themed courts of the mall are the primary means in which Ibn Battuta's narrative the Rihla (Travel) is communicated to potential innovation adopters. Millie Creighton claims, "…not only consumer goods, but promotional catalogues and even the physical space of store layouts constitute cultural objects. These establish a physical reality heavily imbued with symbolic meaning" (Creighton, 1994, 1). The architecture, visual presentations and displays in the Ibn Battuta Mall are a new attempt to promote and enhance the educational and entertainment experience for visitors to a mall.

THE FIVE INNOVATION ATTRIBUTES

There are five innovation attributes used by diffusion researchers to determine the adoption of an innovation. Rogers defines adoption as "…the relative speed with which an innovation is adopted by members of a social system" (Rogers 2003, 476). The five innovation attributes associated with adoption include: relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003, 229-266). These five conceptually distinct attributes are a standardized classification system that has been used in diffusion research for over fifty years with a great deal of success in predicting the adoption of an innovation (Rogers, 2003, 223). Innovation attributes and their perception by adopters were found in research such as the work on adoption of solar energy systems by Duncan G. Labay and Thomas C. Kinnear (Labay and Kinnear, 1981) to be stronger predictors of "innovativeness" (Rogers, 2003, 22) than demographic information. The innovation attributes of the mall's edutainment strategy may predict the adoption of edutainment as a communication strategy by local citizens, residents and visitors to the mall. The following sections of this paper define the five adoption attributes and apply them towards an analysis of the adoption of edutainment in the Ibn Battuta Mall.

RELATIVE ADVANTAGE: GLOBAL PRESTIGE

The assumed advantage of edutainment goals in the mall is that educational and entertainment opportunities will enhance a shopping experience. Diffusion theory posits: "…relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 2003, 15). Relative advantage is often measured by gains in economic profit or social prestige by the targeted audience. Ibn Battuta was one of the first and most extensively documented global tourists the world has ever known, and through his narrative, patrons of the mall have the opportunity to be exposed to a cosmopolitan identity and complex forms of consumerism. According to Crispin Thurlow and Adam Jaworski, "…globalization is, in effect, a sales pitch and the 'global citizen' is both role-model and myth which, in the service of global capital, are designed to encourage spending and consumption" (Thurlow and Jaworski, 2003, 601). The themed courts of the Ibn Battuta Mall are distilled to populist and contemporary notions of world cultures in order to communicate a readily marketable message of luxury and opulence. The relative advantage of edutainment goals in the mall is the prestige that patrons of the mall may gain by going to an edutainment mall rather than other malls in Dubai and the region.

Dubai is an extremely competitive consumer environment for retailers with over thirty malls that house between 150-1200 stores in a geographic area under 1,600 square miles. Large scale shopping environments in Dubai include: Deira City Centre one of the most popular malls in the United Arab Emirates with over 1.2 million square feet of retail space, and the largest mall in world, Dubai mall, part of the Burj Dubai, a 20 billion dollar project, covering over 12.1 million square feet of retail space. Other themed shopping complexes also exist in Dubai, these include: Mercato Mall a shopping complex that heavily borrows architectural styles from European countries such as Italy, Spain and France, and Wafi City a themed mall based on the architectural features of ancient Egypt with glass pyramid roofs and hieroglyphic motifs throughout the mall. The Ibn Battuta Mall is currently the only mall in the UAE and in the region that has based its visual identity, architecture and marketing strategy on a historical figure, promoting itself as the first edutainment mall in the world which also contains a permanent educational exhibition.

The Ibn Battuta Mall emphasizes the prestigious nature of its architecture and visual presentations in order to increase its distinctiveness from other malls. The Andalusia court's main court is inspired by the Alhambra: a palace fortress that was the residence of Muhammed V (r. 1354-1391), Sultan of Granada. The Alhambra

was envisioned as a paradise of lush gardens and highly decorated courtyards filled with colorful carpets and opulent furnishings. Ibn Battuta did not encounter this during his travels. The Tunisia court was inspired by the architecture and design of Moroccan royal palaces. Carved stucco and wood, glazed tiles and the heavy use of arabesque patterns on the walls, ceilings and columns throughout the court impose a level of wealth and luxury to the court's initial attempt to recreate a traditional African marketplace. The Egypt court's main court is depicted as a Mamluk palace hallway and the exterior of the court features ancient Egyptian hieroglyphics and Pharonic gateways *(figure 1)* that are historically conflicting, but highly ornate imperial styles of architecture. The India court combines the most opulent and ornate aspects of Mughal architecture reserved for its emperors. White marble is replicated throughout the interior of the court and carved into ornate floral patterns, motifs and lattice screens. Bright red and gold paint accent the huge dome of the main court and the presence of decorative columns and balconies throughout the India court have transformed it into a palace within the mall. The Persia court's large dome features a recreation of a private palace chapel for the Safavid Shah Abbas I (1587-1629). The dome is decorated with gold and all surfaces are inlaid with mosaic tile and turquoise molding *(figure 2),* a majestic example of 16th rather than 14th century architecture in Iran. The interior of the China court is heavily based upon Qing dynasty (1644-1912) imperial architecture rather than the Mongol Yuan dynasty (1279-1368) architecture Ibn Battuta encountered in the 14th century. The dominant colors used throughout the building, predominately red and gold as well as the heavily decorated surfaces on the coffered ceilings *(figure 3)*, cloud-fungus designs on the ceiling beams *(figure 4)* and the dragon medallions based on Qing textiles on the walls of the building *(figure 5)* illustrate a Qing imperial style that would have been seen as poor taste by earlier Chinese dynasties *(see table 1).*

Table 1 Time frames of Ibn Battuta Mall main courts

Court	Dynastic Influence	Dates
Andalusia Court	Umayyad & Nasrid	661-1031, 1232-1492
Tunisia Court	Nasrid	1232-1492
Egypt Court	Mamluk	1250-1517
Persia Court	Safavid	1501-1736
India Court	Mughal	1526-1707
China Court	Qing	1644-1912

Figure 1
Egypt Court Entrance

Figure 3
China Court Coffered Ceiling

Ibn Battuta's travels occurred in the 14th century between 1325-1355 (Dunn, 1986, 1-4). The mall however, has chosen to highlight architectural designs and features that range from the 7th to the 20th century. The presence and cultural influences of Marinid (1215-1465), Hafsid (1229-1574), Tughluq (1321-1398) dynasties and the Mongol empire (1206-1370) have largely been ignored in the mall.

The mall depicts Ibn Battuta's narrative as an epic journey across lands of wealth and palaces of gold and marble overlooking periods of poverty and intense hardship contained in the original story. Mike Crang (1996, 143) warns, "…a focus on an eclectic mix of historical artifacts/replicas produces a surface of 'historicality' rather than an understanding of history." Most of the themed courts focus on dynasties and empires that ruled these regions regardless of their historical relationship to Ibn Battuta and his narrative. John Hannigan (1998, 99) notes, "…tourists, by and large, prefer romanticized and fictional representations of history and geography, even if these are distortions which are rife with postmodern currents of time-space compression." The themed courts point to visual references that promote a level of wealth and prestige that may be attractive to tourists, but are historically inaccurate in the context of Ibn Battuta's travels.

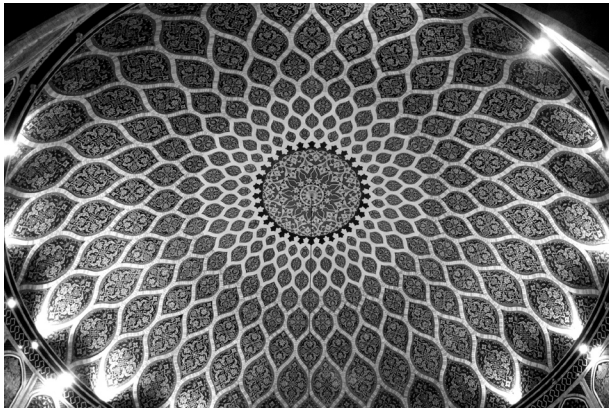

Figure 2
Persia Court Dome

Figure 4
China Court Ceiling Beams

Figure 5
China Court Wall Ornament

COMPATIBILITY: EMPHASIZING AN ARAB AND ISLAMIC IDENTITY

Compatibility is linked to the familiar. An innovation is blocked from adoption if it is incompatible to the culture in which it is presented. Diffusion theory posits: "…compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters" (Rogers, 2003, 15). In order to affirm an Arab and Muslim identity within the mall, the mall's developers have chosen to highlight architectural styles and motifs that illustrate the achievements of Arab and Muslim people and empires even though many of these architectural references negate Ibn Battuta's true origins as a Berber (indigenous northwest African tribe) and are anachronistic to the 14th century world he traveled in.

Ibn Battuta was not ethnically Arab, but was a North African from Tangier, Morocco descended from a Berber tribe known as the Lawata (Dunn, 1986, 19). Morocco, however, is not featured as one of the themed courts in the mall. The themed courts in the mall highlight countries and cultures that illustrate the significance and impact of Arab and Islamic culture on the rest of the world. The main court of Andalusia is inspired by several architectural features present in the Alhambra (1338-1390), also in Granada and the Great Mosque of Cordoba (784-786, 961-976, 987) in Cordoba, Spain. The gilded foliage designs on the columns of the main court appear to be inspired by the mihrab (a niche set into qibla wall indicating the direction of Mecca) of the Great Mosque of Cordoba. The central feature of the main court, the Lion Fountain, is based on the fountain in the Palace of the Lions in the Alhambra depicting marble lions carrying water basins on their backs *(figure 6)*. The Great Mosque of Cordoba is attributed to the Umayyad dynasty (661-1031) and the Alhambra to the Nasrid dynasty (1232-1492). Combining Umayyad and Nasrid architectural motifs and structures in the Andalusia court reflect thousands of years of Muslim rule and influence in Spain, connecting a European country with the narrative of Ibn Battuta.

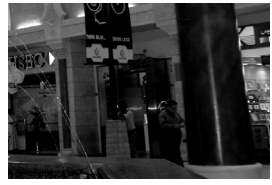

Figure 6
Andalusia Main Court

Figure 7
Egypt Main Court

Figure 8
Persia Court Main Court

The interior of the Egypt Court borrows heavily from the Islamic architecture prevalent in Egypt during the Mamluk Dynasty (1250-1517). The visual focal point of the main court is a large hallway with a heavy wood-framed ceiling *(figure 7)*. The ceiling is a recreation of the most recognizable feature of Ibn Tulun's Great Mosque (870-879) in Cairo. The Mamluk dynasty was a military slave caste that often defeated the crusaders and turned back Mongol invasions. By borrowing Mamluk architectural references as the central feature within the court rather than the ancient Egyptian motifs found on the outside and along the walls of the court, the mall developers have created an overt message of historical Islamic resistance from foreign powers and invasions within the Arab and Muslim world.

The Persia court's main feature is a large dome *(figure 8)* with hand painted tiles with arabesque style ornamentation that is a close approximation of the dome of the Shaykh Lutfallah Mosque (1603-1619) in Isfahan. The Safavid dynasty (1501-1736) has been described as the greatest Islamic empire to rule Iran and the Shaykh Lutffallah Mosque and its dome an indicative example of Safavid single shell dome constructions. The Persian court dome fits into an Islamic architectural form fully realized during the 17th rather than the 14th century architecture of the Mongol Ilkhanates (1256-1335).

The India court is a deconstructed and reconstructed assemblage of Mughal (1526-1707) architecture most prevalently used in the 16th and 17th century. The India court's exterior with its red stone walls, white trimming and balustrades and pointed arches *(figure 9)* was inspired by the tomb of Humayun (1562-1570). The Taj Mahal (1632-1648) was also a point of reference for the India court's white domes and four corner pavilions. The replicated low relief carvings, multi-cusped arches and patterned stone-screen windows in the interior of the main court was inspired by the Pearl Mosque (1659-1660) at the Red Fort in Delhi *(figure 10)*. By focusing on Mughal monuments such as the Taj Mahal and Pearl Mosque, the India Court establishes an Islamic identity that overshadows the sites that Ibn Battuta might have seen during his visit to the court of Sultan Muhammad Tughluq (1300-1351) in 1323.

What is remarkable about the placement of the Ibn Battuta Mall in the city and Emirate of Dubai is the fact that the United Arab Emirates is not present in Ibn Battuta's original narrative. The UAE did not exist as a country until 1972 and Frauke Heard-Bey (2004, 239) notes, "Dubai started as an insignificant fishing village probably some time during the 18th century." Distorting and claiming the architectural legacy of significant Muslim dynasties in other parts of the world is an attempt to raise Dubai's historic and cultural profile. According to Eric Hobsbawm and Terence Ranger (1997, 13), "The ideology of nation, state or movement is not what has actually been preserved in popular memory, but what has been selected, written, pictured, popularized and institutionalized by those whose function it is to do so." The local Emirate population is estimated to be between four to ten percent of the entire population of the United Arab Emirates (Elsheshtawy, 2008, 971). Minority groups such as the Emirates must work with communication strategies that maintain and promote an Arab, Muslim and national identity. The architects and designers of the Ibn Battuta Mall were required to create a shopping complex that focused on an identity that highlighted Arab achievement and the unifying effects of the Islamic faith and shari'a law in the context of the modern city of Dubai, however, merged and manipulated architectural histories and visual presentations in the mall question the authenticity of the information encountered by its visitors.

Figure 9
India Court Exterior

COMPLEXITY: SOCIALLY CONSTRUCTED LEARNING

Complexity is not as significant an attribute to the adoption of an innovation as relative advantage or compatibility but may positively or negatively affect its rate of adoption. Complexity requires ease in perception and utility. Although many of the educational exhibits within the mall are read in English and Arabic much of the exhibition lacks a social component vital to learning environments. Rogers claims: "The complexity of an innovation, as perceived by members of a social system is negatively related to its rate of adoption" (Rogers 2003, 257). Socially

constructed learning is a key aspect of complexity as an innovation attribute and an indicator of adoption (Rogers, 2003, 257). The mall features a permanent exhibition entitled "1000 Years of Knowledge Rediscovered" *(figure 11)* which focuses on Islamic contributions in science and technology. The name of the exhibition and the term 'rediscovered' in the title indicates a sense that knowledge has been lost and now uncovered for visitors. The task of rediscovery has been completed for viewers and the exhibition and displays do little to challenge viewers through group discussion or forms of mentorship. The knowledge individuals gain from the educational exhibits in the mall are not a socially constructed learning experience, lowering the adoption of educational imperatives in the mall.

The Ibn Battuta exhibition consists of over twenty-seven artifacts and displays based on historical inventions, discoveries and innovations by Islamic scholars that can be seen in different locations throughout the mall. The main part of the permanent exhibition is housed in the Egypt court and features the journey of Ibn Battuta presented in large scale colored maps, text and image displays *(figure 12)*. Most of the exhibition contains displays that take an approach that presents artifacts such as khanjars (daggers), chess sets, abacuses, musical instruments, ship models and even spices as valuable objects that need to be preserved and protected under layers of thick glass. Although displays such as an armillary sphere *(figure 13)*, astrolabe and a few monitor displays allow viewers to touch and explore objects and visual information, most of the permanent displays in the exhibition are read in a static manner and offer little interactive opportunities to an audience.

Figure 10
India Main Court

Figure 11
Ibn Battuta Exhibition

Figure 12
Map Of Ibn Battuta's Travels

Figure 13
Armillary Display

Socially constructed learning experiences are essential in public educational environments. Zühal Okan (2003) argues that social interaction during the learning process "…serves a variety of crucial functions, such as provision of feedback, instruction, correction and so forth." The large scale, architectural elements in the Ibn Battuta Mall are more spectacle than opportunities for group discussion. Little or no informational signage exists that describe the relationship of the architecture and design motifs in thematic courts to Ibn Battuta's narrative. Shopkeepers meet and greet patrons to their stores in the mall, answering questions and providing information and cues to potential consumers. The Ibn Battuta Mall, however, does not offer routine guided tours of its educational exhibits, and the individuals stationed in the information booths in recent encounters have more information about where to buy certain items and where to eat rather than anything that historically pertains to Ibn Battuta and his story. Visual information should not be the only way in which information is presented to potential innovation adopters. Social interaction improves educational experiences for audiences and needs to be incorporated in the design of learning environments.

TRIALABILITY: RETAIL ZONING

Trialability is an innovation attribute dependent on the application of smaller units of experience and their personal application. The Ibn Battuta Mall is divided into thematic courts as well as retail zones that meet the attribute requirement of the division of experiences into smaller units. Diffusion theory posits: "trialability is the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, 16). The mall's retail zones, however, establish a conflicting and arbitrary connection to the thematic coding of the courts; a customizable viewing experience is restricted by the lack of coding in educational information and progression through the educational exhibitions in the mall.

The retail space is divided into four zones: entertainment and leisure; major department stores; "up-market" brands and lifestyles; and family and convenience. The retail zones are illustrated as a separate conceptual environment from the thematic courts in map signage and brochures throughout the mall. The shops and food services that make up the retail zones in the mall rarely have a thematic or cultural connection to the themed courts. For example, a Starbucks is the central feature under the Safavid dome of the Persia court, a Géant hypermarket encompasses most of the Tunisia Court and rows of electronic shops surround the lion fountain in the Andalusia Court. The educational exhibits in the mall are also scattered across the themed courts of the mall, often with little

relationship to the themed courts they are placed in. For instance, the "House of Wisdom" *(figure 14)* is a kiosk that depicts the life and works of Islamic scientists and scholars, such as Ibn Al Haytham and the Banu Musa brothers. The kiosk is located between the Andalusia and Tunisia courts and has no geographic or cultural relationship to the Muslim scientist and Iraqi scholars. Ibn Al Haytham (965-c.1040) the "father of modern optics" was born in Iran and lived and worked in Egypt. The Banu Musa brothers are associated with the original House of Wisdom library and translation center in Baghdad.

The separate mapping and placement of the thematic courts, retail zones and educational exhibits in the mall indicate a separate experience for potential adopters of edutainment goals in the mall. The retail zones appear as an imposed layer of consumer driven information. Edutainment goals in the mall cannot be obtained if the educational, entertainment and consumer goals in the mall are never experienced at the same time or in connection with each other.

Figure 14
Hall Of Wisdom

OBSERVABILITY: WHERE ARE THE EXHIBITS?

Observability is an innovation attribute that has often been applied to technological innovations. An innovation must often be seen working in order to improve its adoption. Diffusion theory posits: "…observability is the degree to which the results of an innovation are visible to others" (Rogers, 2003, 16). The physical scale and outer facades of the mall are extremely large and ornate fulfilling the visual requirements of this attribute, however, the exhibition spaces that provide educational information and displays are overwhelmed by the space and marketing information dedicated to retail, entertainment and dining options in the mall.

The mall encompasses over 1.2 million square feet (27 acres) of retail space with over 275 retail outlets, 50 restaurants and food outlets and 21 cinema screens stretching over 1300 meters, almost a mile in length. However, the scale of the educational exhibits in the mall take up less than a fraction of the remaining space within the mall. If all the educational exhibits in the mall were gathered together they would barely fill the main China court. Signage for the exhibitions in the mall are overwhelmed by banners and sale signs spread throughout the mall that market newly established real estate developments and products such as cell phones *(figure 15)*. The maps throughout the mall also indicate stores, coffee shops and restaurants, but provide no information about the location or placement of the educational exhibits. The impressive scale and decorative aspects of the mall do not provide enough information to improve the adoption of educational goals in the mall. Educational exhibits and information in the mall should have a greater presence and accessibility for visitors to the mall in order to make educational opportunities more observable and of use to potential adopters.

Figure 15
Signage In Egypt Court

CONCLUSION: EVALUATING EDUTAINMENT GOALS

In a recent speech on June 4, 2009 made at Cairo University, Cairo, Egypt, U.S. President Barack Obama (2009) noted the significant contributions Islam made to the world:

> *It was Islam—at places like Al-Azhar University—that carried the light of learning through so many centuries, paving the way for Europe's Renaissance and Enlightenment. It was innovation in Muslim communities that developed the order of algebra; our magnetic compass and tools of navigation; our mastery of pens and printing; our understanding of how disease spreads and how it can be healed.*

CONCLUSION: EVALUATING EDUTAINMENT GOALS

President Obama's recognition of Islam's scientific and cultural achievements in his speech served many purposes. His words were made as a gesture of respect and to establish such a relationship between the United States and the Islamic world. The President also spoke of the great benefits obtained from "innovation in Muslim communities." New ideas continue to proliferate in the Islamic world, and designers working in cities such as Dubai are quickly adopting new ways in which to utilize communication strategies such as edutainment. Many exhibition designers have tried to reach the same level of success in educating and engaging audiences that Ray and Charles Eames were able to convey in their exhibitions, but they have very mixed results.

Educational and entertaining environments in which global narratives such as the story of Ibn Battuta can be explored appear to be an innovative and intriguing manner in which to understand how the world is linked through a common and shared history. Communicating thousands of years of history, scientific and cultural development in a retail environment is a daunting task—edutainment goals in the Ibn Battuta Mall have failed to strike a balance between education and entertainment goals. An analysis of the goals of edutainment in the mall through the application of diffusion theory and its innovation attributes, demonstrates educational goals that have been compromised by political and commercial imperatives. The creation of a themed retail environment whose goal is to educate and entertain are added to the mall as an element of prestige for mall patrons, expressing opulence and luxury as a method to engage viewers in the themed courts. The themed retail environments, however, have led towards consumptive rather than learning behaviors. The mall also attempts to establish an Arab and Islamic identity for the shopping complex, underwritten by anachronistic and manipulated histories, altering and displacing Ibn Battutas original narrative. Guests to the mall are presented with a number of exhibitions and displays that allow them to access information about Ibn Battuta and other Islamic scholars and scientists, but these exhibitions and displays are ultimately static and do not create opportunities for socially constructed learning. The seperation of areas in the mall into themed courts with shopping, leisure and entertainment zones, creates an environment in which learning becomes fragmented and de-contextualized. The scale of the mall is impressive, however, the retail and entertainment options for viewers overwhelms the educational opportunities in the mall.

Edutainment strategies within the Ibn Battuta Mall are incompatible with the goals of engaging and educating an audience because authenticity and learning are compromised in order to attract greater audiences and push political and commercial goals above educating the public. Edutainment in this mall is better defined as a marketing strategy rather than a means in which to educate and entertain visitors to the mall. Designers must understand the way in which new ideas are adopted and that historic and cultural design projects require a careful questioning of accuracy and intent.

REFERENCES

Ajzen, Icek, and Martin Fishbein. 1980. *Understanding Attitudes and Predicting Social Behavior.* Englewood Cliff, NJ: Prentice-Hall.

Ajzen, Icek, and Martin Fishbein. 1975. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research.* Reading, MA: Addison-Wesley.

Anheier, Helmut K. and Stefan Toepler. 1998. Commerce and the Muse: Are Art Museums Becoming Commercial? In Weisbrod, Burton A., editor. *To Profit or Not to Profit: The Commercial Transformation of the Nonprofit Sector.* Cambridge, UK: Cambridge University Press.

Bandura, Albert. 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, Albert. 1977. *Social Learning Theory.* Englewood Cliffs, NJ: Prentice-Hall.

Battuta, Ibn. 1958. *The Travels of Ibn Battuta, A.D. 1325-1354,* translated with revisions and notes from the Arabic text edited by C. Defrémery and B.R. Sanguinetti, by H.A.R. Gibb. Cambridge, UK: Hakluyt Society, Cambridge University Press.

Benton-Short, Lisa, Marie D. Price and Samantha Friedman. 2005. Globalization from Below: The Ranking of Global Immigrant Cities. *International Journal of Urban and Regional Research,* 29, December 2005, 945-959.

Berman, Paul and Milbrey W. McLaughlin. 1974. Federal Programs Supporting Educational Change. In *Model of Educational Change, Volume 1.* Santa Monica, CA: Rand Corporation Report.

Berman, Paul, and Milbrey W. McLaughlin, 1975. Federal Programs Supporting Educational Change. In *The Findings in Review, Volume 4.* Santa Monica, CA: Rand Corporation Report.

Berman, Paul, and Milbrey W. McLaughlin, 1978. Federal Programs Supporting Educational Change. In *Implementing and Sustaining Innovations, Volume 8.* Santa Monica, CA: Rand Corporation Report.

Chhabra, Deepak. 2008. Positioning Museums on an Authenticity Continuum. *Annals of Tourism Research,* 35.2, 427-447.

Crang, Mike. 1996. Magic Kingdom or a Quixotic Quest for Authenticity? *Annals of Tourism Research,* 23.2, 415-431.

Creighton, Millie R. 1994. Edutaining Children: Consumer and Gender Socialization in Japanese Marketing. *Ethnology,* 33. 1.

Dunn, Ross E. 1986. *The Adventures of Ibn Battuta: A Muslim Traveler of the 14th Century.* Los Angeles, CA: University of California Press.

Elsheshtawy, Yasser. 2008. Transitory Sites: Mapping Dubai's 'Forgotten' Urban Spaces. *International Journal of Urban and Regional Research,* 32.4, 968-988.

Gatignon, Hubert and Thomas S. Robertson. 1985. A Propositional Inventory for New Diffusion Research. *Journal of Consumer Research,* 11, 849-867.

Hall, Peter. 2001. Pulling Them In; Now Showing: Something Dazzling. *The New York Times,* Museums, May 9, 2001.

Hannigan, John. 1998. *Fantasy City: Pleasure and Profit in the Postmodern Metropolis.* New York, NY: Routledge.

Heard-Bey, Frauke. 2004. *From Trucial States to United Arab Emirates.* Dubai: Motivate Publishing.

Hobsbawm, Eric and Terrence Ranger. 1997. *The Invention of Tradition.* Cambridge, UK: Cambridge University Press.

Hourani, Albert. 1991. *A History of the Arab Peoples.* New York, NY: Warner Books Inc.

Ibnbattutamall, About the Mall, (http://www.ibnbattutamall.com accessed January 5, 2009).

Ibnbattutamall Mall, Welcome to Ibn Battuta Mall, (http://www.ibnbattutamall.com/aboutthemall.html accessed January 5, 2009).

Khair, Tabish, Martin Leer, Justin D. Edwards and Hanna Ziadeh, editors. 2005. *Other Routes: 1500 Years of African and Asian Travel Writing.* Bloomington, IN: Indiana University Press.

Kirat, Mohamed. 2006. Public Relations in the United Arab Emirates: The Emergence of a Profession. *Public Relations Review,* 32, 254-260.

Kirkham, Pat. 1995. *Charles and Ray Eames: Designers of the Twentieth Century.* London, UK: The MIT Press.

Labay, Duncan G. and Thomas C. Kinnear. 1981. Exploring the Consumer Decision Process in the Adoption of Solar Energy System. *Journal of Consumer Research,* December 8, 271-278.

Makintosh-Smith, Tim. 2008. Edutaining Dubai. *Saudi Aramco,* 59.2, 14-19.

Makintosh-Smith, Tim. 2002. *The Travels of Ibn Battutah.* London, UK: Picador.

McLean, Fiona. 1997. *Marketing the Museum.* New York, NY: Routledge.

Miller, Michael B. 1981. *The Bon Marche: Bourgeois Culture and the Department Store.* Princeton, NJ: Princeton University Press.

Mort, Paul R. 1953. Educational Adaptability. *School Executive,* 71, 1-23.

Mort, Paul R. 1957. *Principles of School Administration.* New York, NY: McGraw-Hill.

Obama, Barack. 2009. Remarks by the President on a New Beginning, Cairo University, Cairo, Egypt. (http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-at-Cairo-University-6-04-09/ accessed, June, 20, 2009).

Okan, Zühal. 2003. Edutainment: is Learning at Risk? *British Journal of Educational Technology,* 34.3, 255-264.

O'Keefe, Daniel, J. 2002. *Persuasion: Theory and Research,* Second Edition. Thousand Oaks, CA: Sage Publications, Inc.

Pacione, Michael. 2005. City Profile: Dubai. *Cities,* 22.3, 255-265.

Rogers, Everett M. 2003. *Diffusion of Innovations.* New York, NY: Free Press.

Rotter, Julian B. 1954. *Social Learning and Clinical Psychology.* Englewood Cliffs, NJ: Prentice-Hall.

Singhal, Arvind and Everett M. Rogers. 1999. *Entertainment-Education: A Communication Strategy for Social Change.* Mahwah, NJ: Lawrence Erlbaum Associates.

Stensgaard, Anne-Birte. Increasing Demand in Interactive and Educational Exhibits in Region. (http://www.ameinfo.com/57404.html, accessed, December 2, 2008).

Thurlow, Crispin and Adam Jaworski. 2003. Communicating a Global Reach: Inflight Magazines as a Globalizing Genre in Tourism. *Journal of Sociolinguistics,* 7.4, 579-606.

Wollons, Roberta, editor. 2000. *Kindergartens and Cultures: The Global Diffusion of an Idea.* New Haven, CT: Yale University Press.

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WHAT HAVE WE LEARNED FROM COMMUNICATION DESIGN FAILURE?

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ABSTRACT

In closing, the guest editors of this *Visible Language* special series reflect on the failures identified in the various papers and interpret what this suggests for design education and research in the context of changing practice. The failures cited in this series point out the fractures in our understanding and practices from user-centered, digital, process-oriented, cultural, ethical and even safety-oriented perspectives. Three common themes are explored as context: theory, ethics and process. The need to update design education and identify research needs are discussed based on what the papers in this series suggest.

Fractures in our understanding and practice of communication design are evident in the "Communication Design Failure" series. Before discussing what these faults might suggest to design education or research, it is worthwhile to take a moment for an overview of the papers, to identify their common characteristics because the three themes that emerge signal a shift in attention. Such reflection helps us to better learn from failure.

IDENTIFYING COMMON THEMES

• *Theory*

Five authors anchored their discussion with theory that structured their critical approach to failure *(see table 1).* The theories ranged from a detailed analytic use of visual rhetoric (van der Waarde) to an examination of semiotics and semiology along with individual interpretations and applications (Storkerson). Diffusion theory (Lee) and an anthropological approach to communication theory (Singer) took another perspective on meaning in design, while critical realism grounded a more extensive look at stakeholders (Doherty). Theory is often dismissed as inconsequential in design, yet here theory is explored and used purposefully.

Table 1 Theme analysis of papers in the Communication Design Failures journal series

Author	Process theme	Theory theme	Ethics theme
Barnes et al.	• Decision-making • Stakeholders		
Brown	• Prototyping		
Doherty	• Stakeholders	• Critical realism	
Lee		• Diffusion theory	• Information authenticity
McDonald	• Stakeholders • Systems		
Roesler	• Systems • Decision-making		• Safety
Singer		• Communication theory	• Safety
Storkerson		• Semiotics	
van der Waarde	• Decision-making • Stakeholders	• Visual rhetoric	
Winkler	• Design education		
Yee	• Risk management		

• *Ethics*

Ethical failures were cited in terms of information authenticity (Lee) and in terms of safety located in the realm of information confusion based on overload and lack of integration (Roesler) or based on confusing form (Singer). Designers do not often consider the harm information can inflict. The examples of failure raise the question of truth telling. Whether it is an intentionally misleading form in the case of Singer's ambulance/mailbox for example, or a careless rendering of history in the case of Lee's Ibn Battuta Mall, the question is what responsibility the designer has relative to the character of the content and form presented to a public. In the case of Three Mile Island control panels (Roesler), process shortcomings, while typical of the time, led to near disaster.

As abundant information is more easily distributed and accessible to the public, two approaches to information ethics are apparent: "let the recipient beware" places responsibility on the user of information to determine its truthfulness, the other is to hold those who produce it responsible for accurate and clear information. Neither approach by itself will solve the ethically rooted quality problem. For example, the proliferation and persistence of 'urban legends' are a clear demonstration of the scope of misinformation and the inability to eliminate it.

• *Process*

All of the contributors to the Failure series discussed a changing design process from various points of view including in particular: stakeholders, decision-making and systems. Recognition of more complex relationships among stakeholders and how to manage their requirements, desires, conflicting needs and priorities was dealt with directly (Doherty, van der Waarde, McDonald) or indirectly (Barnes et al.). Managing expectations and results from various stakeholder perspectives is a result of a broader understanding of design process and who the process and result impacts and serves. These can be delicate and politically charged relationships that directly alter the design result.

Closely related to this is the issue of decision-making. In the past designers have understood their role to be that of artist/creator, with significant decision-making power if they had a good relationship with their client, or conversely they understood their role as handmaiden to their client's decisions. With a more complex array of stakeholders, with or without a collaborative team, decision-making becomes something to argue and negotiate based on knowledge and information. Designers have yet to step up to this change in process.

Systems, by their nature, require a dynamic and integrated approach. Complex systems require a collaborative team with different knowledge and points of view. The signage investigation (McDonald) shows how static or generic most signage is; it uncovers the workarounds, aesthetic messiness and confusion that results from a lack of systems thinking that anticipates the many contingencies that require changeability. In contrast, a complex technological energy plant (Roesler) demonstrates that holistic thinking is essential, seeing the entire possible pattern of events, working through the links in a system not only based on their probabilities of occurring, but playing the devil's advocate, working through the sequential strategies needed to make things right when they go wrong.

Other process issues include the nature of prototyping, when, why and how it is used—its' character and its' flaws (Brown). Reflective design process in terms of risk management (Yee et al.) shows that anticipating problem areas in a project can smooth out the process and possibly produce a better result. Because design exists in a context of complexity, uncertainty, instability, uniqueness and value conflict (Schön. 1983), risk is always present. Risk avoidance is virtually impossible, so it is better to face it. Finally, design education is stagnant (Winkler) and fails to address the changing context of design whether from the standpoint of theory, ethics or process.

The nature of the contributions in terms of Theory, Ethics and Process flags the continuing interest in improving design process, again we note their lack of emphasis in design education. Our discussion emphasizes theory as practical—to provide possible new analytical and/or generative tools for design. Ethics gets into the character of what designers are asked to create and their need to take a larger view of what they create and its social context of use and impact. Design has never embraced one accepted process; a more inclusive process that addresses the dynamic nature of our time is needed. These three themes indicate that much design education is out of step with advanced practice and the situations in which we work.

Symbolic gadgetry (whether hardware, software or their symbiosis) has become more powerful than the purpose for which the gadget was designed or the quality of the culture that is shaped or supported by it. A metaphor for information technology in relationship to useful and applicable information comes to mind: today, it is like driving a Lamborghini, capable of speeds beyond 200 miles on undeveloped roads with potholes that barely allow speeds greater than 25 miles per hour, making the sleek car in the public sector not more useful than an old lawnmower.

There is a great disparity between technology and the democratic needs for information. Turnovers between phases of technology have become so extraordinarily sped up, that when some users are still at the initial step of discovering process and function, others have already progressed to the next stage in this process of rapid style, feature-oriented and profit driven obsolescence. The time required to keep abreast is robbing users, and in this case also designers, from deeper and better understanding of human relationships, human communication and consideration of cultural goals. The focus is on cheap entertainment with technology as a preferred end-all goal. What about meaningful and helpful guidance through the perplexing complexity of information?

Digital communication technology is not about itself—not about its style, sleekness or its heavily layered capabilities or flexibilities. It is in service of socially empowering exchange of useful cultural information between human institutions and citizens in a variety of democratic configurations, activating commonly agreed upon conventions, developed over many centuries for the use of language, signs and etiquette.

The not culturally but corporately induced production of gadgetry is pressing an already mostly useless information-overload to extremes. Do marketers, corporate executives and their designers ever sit down beforehand to measure the projected change of newly introduced technologies in relationship to their impact on culture and society? For example, will the 140-character limit of message-length of a much-touted social network-blogging process trivialize the message or confuse the recipient? Is hindsight the only way to cope with the evolutionary results? Does it mean that if one is critical of technology, that one is simultaneously anti-progress, or that if one wants to slow down the process to investigate and consider social impact, that one is old-fashioned and conservative? Do designers see themselves as helpless participants that must endorse every new design disregarding its impact on the culture? What are the designer's measures for efficiency, expediency or loss of detail, depth and convention in relationship to their ultimate responsibilities to society and culture?

This aggressively dynamic process, on one hand is linked to further emancipation of the human race, but on the other is creating a cultural superficiality in which having 'googled' and surfed some sites stands in for having synthesized and prioritized information from the different disciplines to support and improve the culture. Designers need to develop a functioning ethics and aesthetics of communication. They need it badly as an ideal with which to address their involvement in all social and cultural issues. They are not just the hands of corporate management. They are facilitators of culture.

UPDATING DESIGN EDUCATION

Now that the plethora of two-year and four-year schools offer graphic design, visual design and even communication design courses of variable character, which are copied by certificate and workshop-schools like Gibbs Schools (Career Focused Learning) or ITT Technical Institutes (Education for the Future) and listed among subjects like bartending, hair design, nail and skin care, massage therapy, law enforcement, automotive repair and culinary arts, it is time for universities to drop the pretense of delivering professional design education and switch from concentrations on vocational/technical training to constructing the intellectual, cognitive and theoretical base from which a design discipline has a chance to evolve. Universities can no longer milk the cash cow of bourgeoning enrollments in baccalaureate design programs to fund other activities. They must begin to intellectually pump-prime the long neglected graduate preparation for advanced communication design levels required by a disciplinary and professional world.

Having failed to build a design profession on the basis of introductory and survey-course sequences as in the liberal arts (psychology, sociology, anthropology, literature, etc.), and having neglected graduate design education for much too long, the spectrum of needs for shaping a design discipline is vast. It is going to be extremely difficult for stand-alone art/design schools to fill the increasing professional demands. Only at institutions with larger arrays of disciplines will it be possible to have access to intellectual components outside the traditionally accredited design programs.

Some designers' responsibilities stay separate and become specialized; others overlap in relationship to the studio's sophistication and size or project-demands generated by clients. Design programs vary widely in quality and depth, but all stay academically undernourished. They are in need of serious and critical academic review, and many of them should be restructured, upgraded or abolished.

Most design-career responsibilities fall into the following areas.

- *The application of principles of visual literacy and aesthetics to form-making and formatting in letterform, type and image communication environments*

This is the 'ground zero' level, borne in and encapsulating the traditions. It represents only a fraction of the responsibilities of contemporary designers. It concentrates on the continuous upkeep of the assortment of aesthetic and studio-related technical skills. While this competency is the only distinction from other types of authoring, concept-shaping and narrative disciplines, it has never been developed to very high intellectual levels. In fact, it has been trivialized in over simplification of complex information.

The only timeless activity seems to continue in information design. It requires designers to step away from beautification, styling and visual entertainment and concentrate responsibly on making information intelligible, to facilitate the user/public's access to information, that because of complexity or novelty may be easily misinterpreted, or because of social and cultural factors is difficult to comprehend. While information design seems to be the most solid platform in communication design, the new task of interaction design must venture out further and leave the two-dimensional desktop behind and begin to cope with the available digital, time-based power to construct information driven dynamic narratives and diagrams.

Across the board, in vocational as well as academic programs for the past two decades, the emphasis has been predominantly on coping with the reality of emerging digital technologies, thereby arresting all other studio skills at a point located in several decades ago, allowing only shifts from one style agenda to another. Even though digital efficiency promised more time for in-depth information searches, responsible concept development or metaphorical experimentation to increase the field with richer and more sensitive icon analogies or image allegories—this was not realized. Lip service has been given to advancement and sophistication of visual metaphors, but a perusal of the professional media proves that more invention is dedicated to style rather than metaphor development.

• *Theories in the communication sciences*
Even though most design programs are accredited, one surprising fact jumps out from investigating design program catalogues from even name schools and universities, there are few or no requirements in theoretical communication subjects, especially those theories that expose the complexity of human interactions, thought and values, filtered through psychology, social and cultural anthropology or philosophy, with the latter beginning to construct frames for human values and interpretations of logics. Topics like Network Theory, Analysis and Attribution Theory, Attraction-Selection-Attrition Frameworks, Classical Rhetoric (Narrative Construction, Information Theory, Agenda-Setting and Argumentation Theory, Structured Value Determination Theory, Minimalist/Pluralist Mental Communication Models, Meaning Management, Discourse Theories, Text and Psycho-Linguistic Theory, Social Cognitive Theory including Social Cues, Group and Individual Social Identity, Theory of Planned Behavior/ Reasoned Action, Language Expectancy Theory and other valuable subjects that support and deepen communication performance remain ignored.

• *Applied research: human factors in communication*
It is interesting to see concepts of 'sustainable design' or 'green design' emerge in course descriptions, they will stay most likely as meaningless slogans, unless programs bring to bear the deep understanding of physical and emotional human factors, which drive visual and verbal—and all aspects of social and cultural communication. 'Sustainable design' cannot be experienced as theory. It must be tested through many social and cultural filters guided by interdisciplinary knowledge and verified and refined through applied research and testing. At the center of all human endeavors stands communication. It is where all interdisciplinary knowledge comes together to construct models of human environmental complexity of which visual communication is just one minor slice. The area of applied research remains mostly neglected.

• *Management of business, studio, project and client relationships*
Very few design programs offer courses for establishing management skills for leading a design studio, selecting, fostering personnel and evolving creative teams. Such leadership is similar to a combination of teaching, coaching and facilitating. For too long the field of practice has relied on designers to emerge unaided as team members, leaders and design managers without design schools providing knowledge

of business frameworks and strategies (self-marketing, public relations, venture strategies, competitive strategies, marketing strategies and tactics), systematic business planning or understanding of decision sciences.

IDENTIFYING RESEARCH NEEDS

• *Time*

While communication design has focused on spatial organization, internal relationships and pacing, once designed it has been static, subject to review and updating, but with a subsequent static result. Information today is dynamic; today's audience is impatient and understands the changeability of situations. Further, they know that poorly organized information robs them of time and increases frustration. Information architectures, information compression, searching, synthesizing or comparing data, understanding the context of use and developing systems approaches to changeable information—these and other time-related topics are germane investigations for research.

• *Design research methods*

There are many legitimate ways to do research. The first step to understanding the range of possibilities is for someone to analyze the evidentiary basis needed. For example, substantial research is needed to provide a foundation for subsequent work, thus casual, suggestive results will be inadequate. Other research studies may be at the other end of the spectrum—suggestive or preliminary to support product development or prove a research process is useful. Of course, there are many positions between these extremes with particular research methods more suitable not only in relation to the research question being asked, but also in relation to the evidentiary need and the practicalities of what can be accomplished. The well-known and revised (1980) *Design Methods* (Jones, 1970) incompletely serves design with its changing disciplinary and interdisciplinary research context. A new compendium that addresses design research methods is needed.

• *Collaborative process*

Related to the understanding and application of research methods is the need for a better understanding of collaborative process across disciplines so that there is understanding and agreement about research process and findings. This can circumvent argument about legitimacy and aid in negotiating decisions. Collaborative work is the future of design. Much can be learned about process from collaborative efforts in healthcare and business. A practical approach to building such a process is through case studies from which best practices might be extracted.

• *New approaches to research reporting*

Designers largely ignore research reports because they are in a formal language directed to researchers; they seem dry and overly complex, fail to address the designer's practical problem and require substantial interpretation to use—if at all. How might we extract the important findings (keeping the process behind the scenes, but available to those who might have interest)? Demonstration of research in practical use is also important. In this case, the demonstration can validate the research to some extent, or may suggest needed new approaches to the research question. A fluid relationship between design research and practice needs to be developed.

• *Learning*

As pointed out earlier, design education is lagging behind the changes that are reshaping our information and communication lives. New curriculum is needed, but it is not just the writing of objectives or developing a syllabus. New strategies for delivering learning, putting it to use and synthesizing it into design experience is called for. And it is not just trying it out once, but thoroughly testing its efficacy and adapting it for better learning performance. Design traditions cannot be saved whole cloth—they must be amended and amplified based on the changed context of performance.

CONCLUSION

The Communication Design Failures series demonstrates the ability to ramp-up understanding and performance based on an analysis of what goes wrong in process or design result. This requires an ongoing egoless look at history and results in order to actually learn from failure. The failures are instrumental; they point to needed change. This is work that only designers can accomplish as design is such a ubiquitous but under-appreciated undertaking; others in other disciplines lack the interest or understanding for such work.

The authors in this series have a reflective turn of mind; they are not just "doing" design, they are thinking deeply and critically about design performance, the changing context and expectations they encounter and the future of design. People often consider the relationship between academia and practice to be a chicken-egg paradox—who leads and who follows. This simplistic analogy is not appropriate. Changing requirements and possibilities travel in both directions, from more substantial academic training to professional work, and from emerging, more sophisticated practice (complex problems, interdisciplinary collaboration, digital evolution, etc.) back to academia and the need for continuous learning. Failures signal opportunities for change whether from an academic or professional perspective.

REFERENCES

Jones, John Chris. 1970. *Design Methods*. New York, NY: John Wiley & Sons.

Schön, Donald A. 1983. *The Reflective Practitioner.* New York, NY: Basic Books.

AUTHOR NOTE

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