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Field Exam 3

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The history of form versus function in design and its role in the creation of web sites

I have reframed the concept of “form follows function” and explored the following statements, “form versus function,” and “design leading technology,” in an attempt to fully explore the idea of when design has led the creation process throughout history. Alois Riegl argues in his book *Problem of Style*, that design patterns, including the Assyrian Guilloche, Ancient Egyptian spiral and zigzag, borders, and the heraldic style; and specifically the vegetal motif, were passed down through history in an identifiable succession and clear evolutionary pattern that relied heavily on preceding cultures and artisans. The author dedicates the majority of the book to the vegetal motif, which includes the Ancient Egyptian lotus, the Phoenician palmette and Mesopotamian sacred tree motif, as well as the tendrils, as continuous and intermittent, and eventually as fillers of open space. From the beginning, the ornamentation and designs Riegl describes were used as functional forms representing religious ceremonies and human events such as feast and hunting activities, but the assumption is artists at the time were more inclined to use readily available tools for expression and less inclined to develop technologies that the design commanded. Cave walls were used as “Canvasses,” while hunting tools and pottery were adorned with spiritual symbols and events, applied as secondary consideration or enhancements.

Riegl covered 3,000 years of ornament motifs and “epoch-making” achievements. He begins with the exploration of where ornamental design originated as far back as the caves of Dordogne, as well as possible artist’s inspiration, giving academic reflection to the idea that motifs were influenced by the patterns of weaving and wickerwork. The author shows evidence that disputes the autochthonous ornamentation argument. He described this as art equaling technique and by the end of the book convincingly demonstrated changes and iteration of original designs that evolved from previous cultures and not indigenous plants or nature. Riegl uses his argument to show that society and cultural influences had more impact on the evolution of design over the artists’ inspiration, but I extend his point to show that technology was happening independently of the evolution of design. Although design had a functional purpose, it was not superseding innovation for human needs. The author notes that the Ancient Egyptians clearly copied the lotus plant, but immediately created a symbolic image, never intending a realistic interpretation, while the Phoenicians who created imitations of the Egyptian and Mesopotamian art for trade, recreated the ornaments but purely for commercial intent as decorations. During this period, the Phoenicians recreated previously representational ornaments and used these images simply as decorative ornamentation. With earlier societies, it is difficult to identify areas of inspiration from design, such as tools of expression, the Phoenician culture was easier to surmise the role their designer’s held as the society was built on commerce and expediting acquired merchandise instead of innovating new products.

As the expression of ideas moved out of the cave and beyond the limited sphere of the tribe, an alphabet formed and a standard language emerged that could be distributed beyond

the original author. I would argue that expression of language was one of the first instances of form leading function. Drucker and McVarish state, "Writing depended on the design of a stable visual code for the representation of language (Drucker 11). As oral expression was symbolized by marks that turned into symbols, then evolved into glyphs, and eventually characters that formed letters and an alphabet, design was instrumental in shaping an efficient, transferable, universal system of communication. This desire for expression facilitated new tools such as the stylus, stamp, seal, and chisel; all directly influenced by the design process. "The earliest known hieroglyph date [is] from about 3100 B.C..." (Meggs 10). "Variations in the shape of scripts may [have] result[ed] from available production technologies [such as] (clay, wax, stone, etc.)" (Drucker 17), but I would conclude that design that best communicated the stories of the day dictated the innovation of tools that facilitated these expressions. The authors Drucker and McVarish further support my argument for the influence of design over the evolution of written communication:

Tracing the spread and transformation of writing requires attention to the functional as well as the formal design of scripts as systems. Graphic form establishes stability in the representation and operations of language. The order and number of signs in a script are also part of its design as a system. But the tools and materials that produce and carry a writing system must be taken into account as well because they impose fundamental constraints on its graphic form. The task of devising a set of repeatable elements to be carved in stone is very different from that of impressing consistent signs in wet clay or forming them with a brush or pen. Although technology does not determine forms of writing, it may modify their design (Drucker 23).

Art movements provide a distinguishable “mood” of the time and expressions that represent the Zeitgeist of that period. I will briefly summarize movements that addressed the issue of form over function between the time periods of the early 19th. century through the 20th. century. These signs of the time give valuable insights into the importance of art to society, the role of the designer and impact of art over technology.

History of design

I begin with the Guttenberg printing press to examine the designer, and influences of form on function. Drucker credits the printing press as creating a booming knowledge industry; he describes the new role of designers: “... graphic designers gave form and style to disseminated texts that were commodities in a new market of literate consumers” (Drucker 75). It is interesting to note that the printing press did not initially advance page design as, “...the standardization of punctuation and spelling was a by-product of typographic conventions” (Drucker 76). Initially, similar to ancient cultures driven by new technologies, design played a subordinate role in advancements. In the case of the printing press, it was expensive to create new type faces, and materials limited the expression of elaborate designs and artistic expression. Many years after printing was mechanized, decorative designs and page ornamentations were still hand illustrated. Even as the printing press created new jobs, opportunities for skilled artisan, and new industries, the limitations stifled designers and forced them to catch up with the technology before they could advance the field. It’s not a huge leap to connect the new perspective afforded by the printing press to the current state that embodies digital environments and web design. Drucker describes the influence of mass

distributed newspapers, as a result of the printing industry, as playing "... a part in the creation of what is known as the public sphere, a virtual space made through the exchange of ideas and information. Communities of belief were built on shared reading and thought rather than common location" (Drucker 95). In a different context, this statement could be describing virtual environments or the web in general. In 1456 when the forty-two-lined Bible was printed by the Gutenberg printing press, there were approximately 50,000 books housed in Europe's monasteries and libraries. By 1500 there were printing shops in 140 towns and 9 million books produced (Meggs 78). The early presses were technological miracles as they reduced the process of printing a page and producing a book to days as opposed to months or years, but it would take 300 years before the cast iron press was able to produce 250 sheets per hour. The printing press is one of many technologies that radically improved during the industrial revolution and by 1815, fifteen years after the first cast iron model was introduced, presses had a 2,400 sheet per hour capacity. I would place the current state of computer technological advancement, somewhere in the 300 year gap of the printing press, close to the steam-powered machine of 1810 and waiting for computing power and broadband access to open opportunities not yet imagined.

The industrial revolution, where design and function collided is where I'll begin with a sampling of art movements that best reflected the struggle between the fields of aesthetic design, form and engineering and function. These included the arts and craft movement out of Britain, the Art Nouveau movement, and Expressionism.

“The Arts and Craft movement was a reaction to industrialization, popularized by mass-produced artifacts. An increasingly vital dialogue developed between industrial methods and fine art” (Drucker 169). “This work shared a belief in design’s capacity to envision alternatives to industrial forms and methods that would reconcile everyday life with human and organic values” (Drucker 167). This movement was a direct reaction to function following form for too long and an attempt to reverse the trend.

The Art Nouveau movement which originated in Paris was described as “A bridge between Victorian clutter and modernism” (Meggs 195). “An international decorative style... organic, plantlike lines, human female form were frequent motifs” (Meggs 194). “Art Nouveau graphic designers and illustrators attempted to make art a part of everyday life” (Meggs 195). Only ten years after the Arts and Craft movement of Britain, the Art Nouveau movement served as a transitional period to the radically new art perspectives to follow.

Finally, Expressionism, was an organized movement in Germany, in the early twentieth century before World War 1, this epoch represented, “...the tendency to depict not objective reality but subjective emotions and personal responses to subjects and events...” (Meggs 264).

“Taking their impetus from the mid-century British Arts and Crafts movement, late nineteenth-century designers redefined the nature of their work. Industrialism had brought the gap between *aesthetic* (form and surface) and *production methods* (means and materials) into focus. Designers saw their role as bridging this concrete and conceptual gap” (Drucker 163). The authors describe a new designer who made a distinction “between things that were made (in the traditional sense) and those that were designed (for production)” (Drucker 163).

Drucker continues to describe a designer similar to the contemporary designer's role of a creative force concerned with all aspects of a project and a broad, multidisciplinary reach. Following influential movements included Cubism, Dada, De Stijl, and the Bauhaus movement in Germany.

The Cubism movement which included such artists as Pablo Picasso and Paul Cezanne explored a new approach to handling space and expressing human emotions" (Meggs 248). It has been described as a design concept independent of nature and technology.

The Dada movement was a direct reaction against the carnage of the First World War. The Dada movement claimed to be anti-art and had a strong negative and destructive element. "Dada writers and artists were concerned with shock, protest, and nonsense. They bitterly rebelled against the horrors of the world war, the decadence of European society, the shallowness of blind faith in technological progress, and the inadequacy of religion and conventional moral codes in a continent in upheaval. Rejecting all tradition, they sought complete freedom" (Meggs 256). The Dadaist, with such artists as Marcel Duchamp, claimed they were not creating art, "but mocking and defaming a society gone insane" (Meggs 257). I would claim this was an instance where the art movement had torn itself away from functional design and the two were developing independently as technological advancements were preoccupied with war.

De Stijl, translated as "The Style," was launched in the Netherlands in the late summer of 1917. Piet Mondrian work is representational of this period. "The Bauhaus and De Stijl had similar aims" (Meggs 311). De Stijl follows the Dada movement and as described in the

following quote, served a valuable purpose in the evolution of art. “DaDa could destroy the old order, [and] then De Stijl could build a new order on the razed site of prewar culture” (Meggs 303). “De Stijl artists sought an expression of the mathematical structure of the universe and the universal harmony of nature” (Meggs 299). I found movements, as noted here, clearly demarked as epochs, provide clear examples of form leading function. Most of the artists involved in a defined “movement” are typically passionate and clear about their purpose. Artists associated with the De Stijl movement envisioned a new world order and unification of social and human values.

The Bauhaus movement represented the concept of design as a discipline that closed the gap between formal ideas and material conditions. The Bauhaus design school founded in 1919 embraced the mission of the Arts and Craft movement and extended it to arts and industry, or arts and technology. “At Bauhaus, no distinction was made between fine and applied art” (Meggs 311). Walter Gropius, the first director of the Bauhaus, was “deeply interested in... a universal design style as an integrated aspect of society” (Meggs 311). The primary distinction between art movements that exemplified form leading function and Walter Gropius’ “universal design style” to the common design found on web sites is who is leading the creation process. In each of the art movements described above, the artist was the innovator. Today the engineer has a prominent role in user interface design and web aesthetics, leaving the artist to a peripheral role of superficial and secondary design.

Computer Technology led by design

In contemporary design, I have rephrased the statement of form following function to design leading technology. Unfortunately, the scale tips towards technology driven design but I

have found instances where the relationship is reversed with notable results and positive outcomes. Following are three concepts that influence design and the relationship to technology, and three designers who have forced technology to follow their lead. In each case of the designers, the leading design perspectives resulted in creating a new, superior product, and even reshaping an industry. The three concepts explored are the book beautiful movement, black box concept, and the office metaphor. The three designers are the architect, Frank Gehry, the Xerox copier team, and software designer, Mitchall Kapor.

Concepts

Often design is gauged by aesthetic qualities and personal preferences which can be difficult to quantify and even more difficult to consistently reproduce and formalize. The following three concepts provide tangible illustrations of the impact of design that led or leads technological advancements.

Book Beautiful Movement

The “The book beautiful” concept “... was formulated in conversations between William Morris and Emery Walker in the late 1880’s” (Drucker 166). Morris was an established and successful entrepreneur that dedicated his later career to revising classic type styles and improving the publishing industry which had declined in quality, but not production. “Most mass-produced books in the nineteenth century were of appalling quality, careless design, and poor workmanship. The challenge to cultivate new visual sensibilities and production values gave rise to the concept of “the book beautiful” (Drucker 166). Morris reintroduced a high-degree of quality that had somehow left the printing industry.

The book beautiful concept is the idea that emphasizes attention to details, aesthetic qualities, and elaborate production techniques. “As early as 1702, William Morris noted that the engineer had replaced the calligrapher as the dominant typographical influence” (Meggs 117). Morris dedicated his life to reverse that trend and consequently his work influenced artisans well after his death. “Successive movements took up his challenge to approach graphic design as a social and cultural activity and a serious engagement with production – not just a set of formal principles” (Drucker 167).

I am intrigued that the idea of quality and “serious engagement with production” would warrant a place in art history or identified as a concept, but at further examination, I wonder if this very concept will need to filtrate into web design and give direction to the current designers who passively participate in the digital environment. It appears that the tidal wave of emerging communication technologies has washed design elements off to the side and at some point a “web beautiful” movement will find a receptive audience, when the contemporary William Morris reminds us that technology can be beautiful and functional.

Black box

The black box concept describes an integral relationship between design and technology and an important aspect in the design process that must be considered when evaluating whether form should be leading function. The black box describes a user’s perspective when interacting with technology. Automobiles have become less transparent in the operations as a machine, and heavily utilize black box design as demonstrated when a driver has difficulty locating the oil plug to drain their oil or when they raise the hood and none of the parts are recognizable. In this instance, black box design turns the designer’s attention to the car interior

and dash board features and not mechanisms under the hood. Computers are another technology that exemplifies the black box concept. One of the results of the black box influences, because users are not exposed to the inner workings of the machine or aware of the technological functions, they adopt a simple cause and effect relationship with the technology. In the case of the computer, when the user presses the "T" key, they expect the letter "T" to appear on the screen. This occurs many times in any given interaction and little thought is given to how or why the letter magically appears. For technologies that are reliable and relatively predictable, a black box design is fine. For technologies such as computers and copiers, the black box design causes issues and frustration for users. In the case of computers, when an error occurs and the expected "T" does not appear, the user lacks the necessary information how to resolve the problem. As a result, a design patch for software is devised, and users are educated how to reboot their computer as the solution. This is an example of technology leading form as the solution is designed after the fact and not into the technology. Many times when software freezes or becomes inoperable, the quickest solution is to restart the computer. This is a design decision to continue with a black box approach and provide an external solution without insight into the application. The Xerox copier company in the early 1980s addressed issues of customer frustration and dissatisfaction by making their copier more transparent. They designed the machines to be more user-friendly and easier to "maintenance" when paper jams occurred or toner needed replacement. Both were common occurrences and they improved the user experience by addressing the human aspects of interacting with the machine. The black box approach to design exemplifies the differences between designing with a preference to function over design, or developing technologies with

design leading function that integrates the user experience into the operations of the technology.

Icons and the Office metaphor

The desktop metaphor and complementary icons were developed to “make the personal computer usable for a community that did not have previous computer experience” (Winograd 33). A graphical user interface, in conjunction with the introduction of the computer mouse, can arguably be attributed with igniting the computer revolution. While the desktop icons are design feature that have had a monumental impact on the computer industry, they are still often discounted as buttons or simple navigation tools that enable functionality. I’ve highlighted the icons and office metaphors because this is an instance when designers influenced the following thirty years of innovation in digital communications by creating interactive tools that engage users and pushes technology to satisfy the public’s hunger for the next application.

The metaphor of the desktop has already been replaced by the metaphor of the page for browsing the Web. Although you still start from your desktop when you use a PC, as soon as you open a Web browser, you are moving away from file folders toward sites made of pages, with pieces of information linked to each other by cross references; this feels different from documents stacked in folders, and folders collected in volumes. The desk is being invaded by loosely connected pages, which float and flutter in infinite free space, making it very hard to keep tidy! (Moggridge 150)

As Bill Moggridge uses familiar words in describing a digital space it illustrates the power of metaphors, as well as the limitations in regards to innovative design. Icons created a “universal” language that allowed users to interact with machines that are the epitome of the black box design concept. And the office metaphor helped introduce the power of computing into the work place. These office icons such as folders, trash cans, and files direct users and guide the way people interact and process information. The power of these metaphors is also the limitations of our innovation. It has become blatantly obvious to anyone who has navigated a virtual environment that physical laws do not apply, but we still continue to design features and functions that resemble the physical world. Design is still tethered to old conventions and antiquated design elements that no longer apply to the digital world.

“In the early days of working on the desktop design, the computer screens had black backgrounds with white texts. Bill Atkinson, while leading the Apple design team for the graphics and user interface for the Lisa computer” (Moggridge 89) insisted that the WYSIWYG design maxim be adhered to and since the black background did not match white paper, the screen color had to change. “The engineers complained like crazy, saying that it would draw more power and burn out the tube faster” (Moggridge 91).

“The Xerox Star (1981) was one of the first systems to use a graphical user interface designed for commercial purposes to use in the office environment” (Winograd 33). “Alto, the first personal computer with a graphical interface and pointing device was created by Xerox in their Palo Alto Research Center in 1972” (Winograd 19). Alto’s cost at the time would have been \$75,000 and was developed to explore possibilities of a personal computer.

The Apple computer Lisa, released in 1983, was the first personal computer that fully integrated user interactions and was quickly followed (eight months later) by the Macintosh which was a commercial success and displayed a unique user graphical interface for the time and embraced the desktop/office metaphor. This is almost identical to the same user interface we are using thirty years later. The design concept that drove user interface for broad use is called WYSIWYG – (What You See Is What You Get). “WYSIWYG design allows the user to see an accurate representation on the screen of the final output. “The interface *is* the product” (Winograd 39).

The metaphor in general is a power design tool. What makes this tool so effective is the cognitive process of, “Recognition versus Recall” (Winograd 21). This is the idea of using icons and metaphors to illicit recognition from end user as opposed to engineering unique features that requires the user to remember the function or steps to perform an operation. “...So, instead of having to remember all of the commands on the computer in a particular instance, all you had to do was recognize the one you wanted” (Moggridge 79).

The original icon and office metaphor are examples where design has led technology. The irony of such ubiquitous design features is now younger computer users who interact with these graphical interfaces have never been in an office and their relationship with a once common metaphor is as a digital environment. It is these emerging designers that will introduce the next metaphor that enables users to make the next technological leap out of the office, and off the desk top. If designers retake their position as leaders in the development of

new applications, these young, new perspectives will drive technology to even greater distances.

Designs

Design is a broad term used by many disciplines that create products, applications and services. Design can be led by a visionary who reshapes an industry, a team dedicated to rethinking the innovation process, or an application that redefines the user experience. The common feature in the following scenarios is the leadership role of the designer in the creation and production process.

Frank Gehry

Frank Gehry is an architect that epitomizes the designer leading the engineers. He relies on sculptural form to shape his structures and an aesthetic perspective to predominantly influence his building designs. As described in the book *Digital Gehry*, Gehry describes the challenge of taking a sculptural form that “resist measuring” (Lindsey 70) and put the design into a format and language that can be reproduced on a construction site. The Gehry team describes a process they call “legitimization” (Lindsey 69). First this term describes a process of converting the complex physical models into a digital model where the complexity is tamed through mathematical description. Secondly, it introduces “rules of constructability” into forms.

When taking a creative concept and transferring it into directions that can be performed by a construction crew, Gehry describes a rationalization and legitimatization

process. In essence, the design team objectifies the technology and science with the belief that once something is measured, it becomes tangible. (Lindsey 70)

To create a complex, flower shaped fountain for the Disney Concert Hall, Gehry utilized a CAT Scan machine. The CAT Scan machine is designed to produce cross sectional images of the brain. The architect's team transferred the scanned images into an image editing software to create a workable three dimensional digital model. Team Gehry then used a machine called a FARO digitizer to digitize the final design model. The FARO digitizer is typically used to "map the vertebrae of the spine in preparation for surgeries" (Lindsey 65).

Gehry uses the phrase, "Form follows skin" to describe the order and process his team follows in their design process. "It refers to designing the structure from the outside-in with the interior structure designed to support the exterior" (Lindsey 38). I would call it function following form and I listed in detail the equipment utilized to construct the architect's visions as a way to punctuate how uncommon it is for design to lead the construction process. The Gehry team utilized design software created for the medical and aerospace industry and developed new digital techniques to translate their 3-dimensional form into the traditional 2-dimensional world of construction.

Frank Gehry is a designer that has forced function to follow his form, but even he will admit, it is not an easy road and despite his successes, the movement to lead technology with design is not happening quickly or easily.

Xerox copier



John Rheinfrank described the evolution of the Xerox copier from opaque technology, where the end user did not see the operational aspects of the machine, to transparent design, as the sequence illustrates above. He labeled an opaque design as “engineering” or “black box design.” The opaque design approach gave the user a false sense of security that the machine would consistently perform in a cause and effect manner, consistently, and flawlessly, every time. The next generation of copiers was influenced by an industrial design perspective. The technology functions were still opaque to users, but the design perspective moved to creating a machine that resembled a piece of furniture that aesthetically fit into the office environment. Finally, Rheinfrank described a machine in the evolution of the Xerox copier as transparent technology. He used the term “glass box technology or experiential design” (Rheinfrank 17). This is more commonly accepted as gray box design, allowing the end user to see the functionality of the machine and encourages users to fix expected errors such as paper jams or replacing the toner as needed. This type of design considers the end user’s expectations and attempts to meet their needs by considering the human factors in the design. The gray box approach to design considers the end user and makes operations, maintenance, and minor repairs intuitive. Rheinfrank also described a design language that if used consistently creates

recognizable patterns across a “family of products” (Winograd 72), that assists the user in learning and efficiently interacting with the product. This design sensibility is considering the “recognition versus recall” process as mentioned earlier.

Rheinfrank’s Xerox copier example, detailing the evolution of design shows the shift that occurred in the early 1980s at Xerox in an effort to “produce more usable copies through more usable copiers” (Adler, Usability, 25). The design team included engineers, product designers, human factors personnel, user interface designers, graphic designers, and system developers. The design process led functionality in a number of ways: First, the overall machine was designed not to conceal functions but to inform the user how to interact with the machine. Secondly, the top of the copier was treated as a work area, using the workbench metaphor and common operations were all placed within arm’s reach integrated within the work area. The third feature designed into the new copier was clearly accessible points with designed points of entry into the machine to refill paper, toner, or clear paper jams. Finally, the interior of the machine was designed to facilitate easy access for user maintenance and minor repairs such as paper jams. Color coding and clear, simple instructions were integrated into the design to guide the users. Other features were designed to enhance the overall user experience and align the user’s expectations with the capabilities of the machine to provide a higher degree of satisfaction. This simple redirection of emphasis from black box engineering to user centric design, which Rheinfrank labels as a “shift from “designing for appearance” to “designing for usability” (Adler, Usability, 39), illustrates the power of design led innovation.

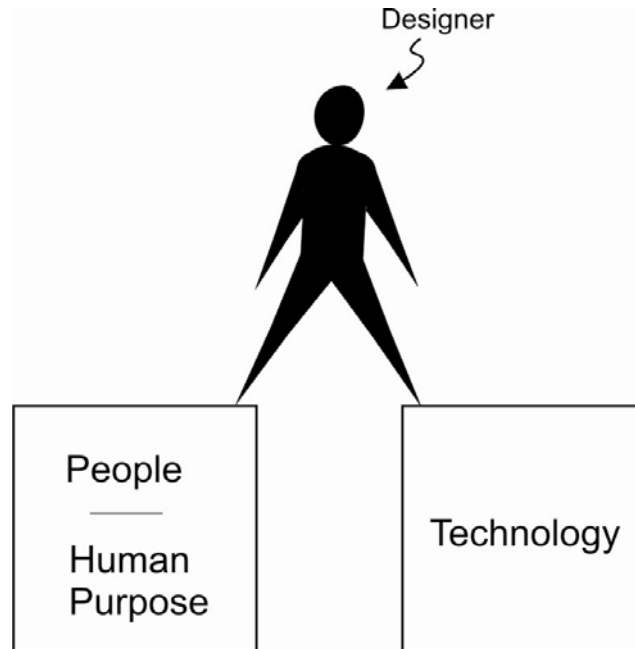
Lotus 1-2-3

The electronic spreadsheet can arguably be labeled as the first software application that popularized the personal computer. A company called VisiCorp founded by Dan Bricklin and Bob Frankston developed the first electronic spreadsheet called VisiCalc, released in 1979. “This application alone instantly turned the personal computer from a hobbyist toy into a business tool” (Young 194).

In 1983 Mitch Kapor and Jonathan Sacks created an electronic spreadsheet called Lotus 1-2-3 that was far superior to the VisiCalc spreadsheet application. In its time, “it was a radically new idea; it led to the PC revolution that populated millions of offices all around the world with desktop computers” (Winograd 228). The Lotus spreadsheet was associated with the IBM personal computer which dominated fifty percent of the personal computing market before Compaq computers and the advent of the PC clones. Kapor would argue that the Lotus software success was due to user focused design before user focused software design was a consideration. Although Kapor was the “primary architect of Lotus 1-2-3 and designed the interaction, he is quick to point out that he was not the programmer” (Winograd 2).

In 1990 Mitch Kapor presented a paper called “A Software Design Manifesto,” a year later it was published in *Dr. Dobbs Journal*. Kapor’s software design manifesto signified another paradigm shift in the evolution of the computer and created a discussion around software design. Kapor was one of the first to introduce the idea that computer applications might be created by people who are not engineers and technical programmers, but artists and designers. He criticizes software that is not designed, but as he labels it, “engineered.” Kapor observed a

common software creation process driven by the programmer and then the design aspects are considered later in the process or even an afterthought.



When defining a designer's position, Kapor describes the person with a foot in two worlds – the world of technology and the world of people and human purpose. The designer's role is to bring these two entities together. In addition to the overall conception and realization of the program, the designer is the champion of user experience and plays a vital part in creating a product that is intuitive, easy to use, applicable to the market needs, and provides a positive user experience.

Kapor's manifesto describes the software design process and details the designer as someone with an appreciation of the overall conditions of use and user needs through a process of intelligent and conscious design. He pulls on the philosophy of the Roman Architect Vitruvius to develop his own theory of software design. Vitruvius identified three areas

necessary for a well designed building: firmness, commodity, and delight. Kapor applies these elements to software design. In regards to software design, firmness describes a program that does not contain bugs that could inhibit function. Commodity reflects a program that is suitable for the purposes it was intended, and delight is the pleasure derived from any application. The manifesto describes three partners in the creation process, each considering an important aspect of a successful software application.

Mitch Kapor's software design manifesto serves as a reminder that design can play a prominent role in application design and lack of design is still an issue today. From the beginning of the computer revolution to today, the role of good software design has been a struggle between function and form with the programmer and engineer focusing on function and calling it design and the designer relegated to superficial, surface enhancements that have minimal impact on the user's experience.

Internet design

Similar to the decline in formal grammar, sentence structure, and even spelling, aesthetic design has taken a subordinate role to functional design in relationship to internet design. I've compared our current stage in design development to the 300 year period of static improvements for the printing press and described a scenario where designers are too busy keeping up with new technology to lead new innovations. Jeff Bezos of Amazon.com, compares internet development to the Hurley washing machine in a speech he gave at the 2003 Ted conference. In his presentation, Bezos describes homes in the early twentieth century that were not wired for appliances and most ceiling light fixtures doubled as electrical outlets. This

provided a precarious and inconvenient predicament when running various electrical appliances. Bezos quotes a 1917 Sears magazine ad that reads, "Use your electricity for more than lights." The problem as detailed by Bezos was the washing machine plugged into a light inside the house, but users often placed the washing machine on the porch, a sizeable distance apart. If an accident occurred, which the Hurley washing machine was known to cause, there was not an off switch and the only way to stop the motor was unplugging the machine. Accidents often involved body parts or the operator's clothes getting stuck in the moving parts and the only way to turn off the machine was to unplug it in the other room. Jeff Bezos compares the current state of the internet to the level of primitive technology in 1908, similar to the Hurley washing machine.

In the contemporary analysis of form versus function, the argument is not whether design is more important than technology or form is a greater priority than function; but, the struggle is who leads the design process. Even though, it is generally accepted that design is defined as a holistic approach to creating a product, the line between function and form is highlighted when a seemingly superficial decoration, ornament or aesthetic consideration limits an added feature or prohibits a specific function. The debates narrow to an allocation of resources and a decision how to divide attention between the two areas of emphasis. Since functional features are more easily identifiable as well as quantifiable and design can be an abstract concept, function often trumps form. As illustrated by the art movements throughout history, attention to different elements in the design process constantly change and emphasis from form to function seems to swing back and forth like a giant pendulum. I sense we are at the top of the pendulum's arc, ready to move back towards a design influence as more and

more scholars and social commentators call for a more dominant role of design in the development and production process.

I equate internet designers to the monks developing the codex book in the third century. Similar considerations are involved as we define and design the internet page, such as editable regions, appropriate borders, headings, and even the ideal font. The current state of design is similar to the early stages of the printing press with a formalized page layout and ornamentation relegated to the borders and spare open spaces around the content. These very layout constraints demonstrate who is leading the design efforts and describe a current page design that is predominately engineered with function leading form.

Finally, I draw a parallel to current web sites and the use of posters throughout the history of art. Posters have always served multiple functions as graphical demonstrations of beauty and visually captivating presentations; as well as calls to arm and rallying cries to the bold and brave. They are an effective medium for broadcasting information and propaganda, as they sway public opinion with visual rhetoric. The posters, similar to web page design, are primarily concerned with information design and presenting a message in an efficient and visually pleasing format. Posters are still used effectively today to promote ideas, events, and messages, but somehow seem archaic compared to digital media. To further my argument that digital design is in its infancy stages, I point to the fact that designers are still using design elements and ornamentation used by ancient civilization 3,000 years ago. Much of the design that fills the internet and colors the pages is simply posters displayed on our monitors.

Conclusion

If history is any indication of what will happen, I predict that internet design will move towards a more prominent design perspective where aesthetic influences leads the construction of applications and force backend, coding and engineering to follow the artists. What Frank Gehry has accomplished in the world of architecture, will ultimately happen in digital design. Where aesthetic design and creative expression force old technologies to bend and form to new ideas and new technologies to emerge that enable more creative expression. Unfortunately, it does not seem likely until cutting edge technology reaches a plateau and new gadgets quit leading the emerging media. As users search for features that enhance their experience and applications that expand their lives, there is a steep increase of new, relevant, technological advancements and aesthetic design is still a secondary concern. This is despite design driven successes such as Lotus 1-2-3 and the Xerox copier.

The call for design led innovation is not new, John Ruskins in the 1800 described, "Industrialization and technology caused this gradual severance [separating art and society] to reach a critical stage, isolating the artist. The consequences were eclectic borrowing from historical models, a decline in creativity, and design engineers without aesthetic concern" (Meggs 167). Dr. Mihai Nadin wrote a paper in 1997 where I quote, "The tasks of design shift from the traditional expectation of giving form, of Gestalt, to inventing new forms, some as exotic as the design of new molecules, new genes, new materials, new forms of human interaction. Indeed, in the computational design context, aesthetic considerations and functional characteristics need to fuse. In order to accomplish this goal, designers can no longer restrict themselves to being agents of order and beauty, leaving the "dirty job," as to how things work, to engineers" (Nadin, "Computational Design," par. 16).

What digital design and current web pages need is a “book beautiful” movement with skillful guidance of someone like William Morris, the passion of the Dadaist, and form and conviction of the Bauhaus movement. Then designers will begin to tap into the true potential of digital media as a beautiful expression and new form of communication.

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