

Placements: Contextualizing Design Thinking

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Introduction

There are a number of complexities involved with the creation of objects today. This complexity engenders significant challenges for design educators in preparing students for the challenges the profession faces. This paper offers an overview of ideas that address the complexities involved with contemporary design work and in particular, design thinking. Further, the paper discusses how this body of ideas can be used to form part of an academic studio exercise that allows students to explicitly engage and develop their own design thinking.

The creation of any object is subject to a variety of concerns that must be addressed in resolving the design of that object. For instance, a manufacturer will obviously wish to introduce a product so that it can build its business to sustain and grow itself. To do this, the role of the product within the company mission, the business plan, the marketplace, and its anticipated role in people's lives must all be rigorously considered. The materials, processing, assembly, and shipping of the product must also be factored in. The product design must further allow for the nature of a product's fit into society. For instance wireless products must meet strict federal standards in communications. Such products, those that can affect our individual well-being, our communities, and community infrastructures, must be designed to meet legislation in the interest of the greater good. There are a variety of attending concerns in conceiving and creating any given product and those listed above are typical of ones that designers encounter. Yet as the need increases to achieve sustainability in our material culture, then very existence of a product, its use, and disposal will also need to be rigorously attended to. This ever-expanding list of considerations is indicative of the complex nature of the contemporary design problem. A term used to describe this type of problem is the 'wicked problem' and it reflects the expanding levels of complexity that must be addressed in making things these days. As the list of considerations grows then the degree of wickedness in the problem can only increase.

Resolving the wicked problem is no small feat. Part of this stems from the difficult nature of the wicked problem. Buchanan argues that this is essentially 'indeterminate', that the solution to the wicked problem can be one of many, depending upon a variety of factors and how they are considered (Buchanan, 1995, p. 6). Indeterminacy does not mean that a solution cannot be found, rather that the nature of the solution cannot be preordained or predetermined. This is in contrast to the 'determinate' problem where the solution, or its default, is fully anticipated. Buchanan argues that historically, most of human knowledge has been established in a determinate way (Buchanan, 1995, p. 6). For example, a recent newspaper article describes a medical study that indicates that large doses of supplemental vitamin C do not reduce one's chance of catching the common cold (*Calgary Herald*, 2005). The study that established this gem of knowledge was designed on the premise that its authors would discover one of two things: that taking vitamin C either lessened one's chances of catching cold, or that it did not. In other words, the outcome of the study was determinate.

The indeterminate, wicked problem is far more open-ended and is therefore more difficult to establish as a specific, determinable problem. It is also more difficult to navigate the nuances and various facets of the problem.

Navigating the Wicked Problem

An aid to understanding the nature of an indeterminate problem can be found in examining how objects themselves become significant. In his essay on product semantics, Krippendorf discusses notions of product meaning for users (Krippendorf, 1995, p. 159). According to Krippendorf, meaning is derived in the exercise of imaginatively placing an object within a potential use context. This notion, that one cognitively places their consideration of a given artifact within a context, is potentially rich in understanding product meaning. A variety of meanings are possible because the number of anticipated use contexts is limited only by the imagination of the user. For example, one might consider how a chair could be positioned in different locations around the house, or that in sitting upon that chair how he/she might respond to exceptional news, or how one could stand upon the chair to reach something up high. Each of these scenarios represents a potential use context for that chair and in each instance the chair can take on the meaning and significance of that possible moment.

That one considers an object within a context is useful in also understanding design thinking and the nature of the wicked problem. Designers will often imaginatively place design ideas for objects into anticipated contexts to try and foresee issues for evaluation and consideration. The difference between designers and users though lies in the nature of the product and how it is considered. For users, the product already exists and is therefore a given—only the context can change. For designers, the product does not yet exist and so it is fluid and ill defined and so both the idea of the product and potential contexts must be imaginatively constructed. Design is a dynamic and imaginative act, where a context can inform how the product is imagined, or conversely, the product idea might inform how the designer constructs the context.

Consider the design problem of a handgrip for a power tool. A designer may, through sketching, arrive at a concept for an attractive appearance for the grip. The designer will consider a line or a curve within the overall context of the form to establish what looks good. Effectively, the designer is placing his/her consideration of the form within a context of formal aesthetics. When the same sketched form is considered in an ergonomic context, the designer will imagine what the design would be like to hold, use, and apply in its intended end use. The designer may make models to further enhance the consideration of the design in any of the foreseen use contexts. Such ergonomic consideration of the grip could lead to the conclusion that the design is not very comfortable to use. Further design studies via sketches and models could then lead to a form that works within both the aesthetic and ergonomic contexts. As the designer generates sketches and models, they represent ideas that are cognitively placed in the different contexts for evaluation and consideration. A new design decision made in response to consideration of a design idea in a given context will require that this new idea is subsequently placed in other contexts for further pondering. In this way designers work and cycle through design ideas in various contexts, including aesthetics, ergonomics, material and process selection and many other attending concerns for the project.

Buchanan refers to contexts used in this way as 'placements' (Buchanan, 1995, p. 6.). In contrast to the typical use of context categories, placements, he argues, are temporary, fluid, and more useful in a flexible manner. They allow designers to establish temporary boundaries to consider their work. Working through placements, designers can establish priorities and mini-hypotheses to effectively play with design ideas and ideas in context, knowing full well that the idea could eventually be tossed and exchanged for a stronger one that better suits all of the placements at play in the endeavor. It is this knowledge that an idea could possibly be jettisoned that gives the placement its flexible quality. Flexibility is also achieved in the knowledge that the placement itself could change based on how the design idea is evaluated (an act sometimes referred to as 'questioning the brief'). In the example of the grip noted above, a modeled idea will serve as a

type of hypothesis of what the design could be. It can then be tested through a variety of placements in which both the design idea under consideration and the placement itself could eventually be adjusted, revised, modified, or replaced.

Part of understanding how placements work and how they can influence design thinking is in the perception of how a given placement can dominate one's thinking. Consider that a manufacturer may wish to undertake a design exercise to address the particular shortcoming of an existing product. With undue focus on this one shortcoming, other issues may not be considered, or there may be a stated emphasis on one shortcoming but other concerns dominate the consideration of the design problem. For instance if the manufacturer is concerned with ease of assembly and assembly time, this might appear as the dominant design problem. However the company may balk at a potential design solution if the capital costs required for tooling or material use are not well anticipated. In this instance the placement of assembly time is in fact dominated by the placement of cost. Understanding the true role of a given contextual placement is important in understanding which problem is to be addressed in a particular design exercise. This aspect of dominance regarding placements is also part of what makes most design problems wicked.

Macro Scale Placements

Another interesting aspect to placements is that they are scalable. That is, not all placements carry the same significance or weight. In designing a feature such as a screw boss, the designer will 'place' a notion of how the screw boss should exist within the overall context of the plastic part being designed. An idea as to how this larger plastic part should exist is typically established within contexts of how it should be manufactured, how it spatially relates to other parts in the assembly, and how it is derived from an initial notion of what the overall product concept should be. The overall product concept is usually established within placements of aesthetics, ergonomics, and market position. An idea resolved within one placement can effectively become the context or placement for next smallest idea. Placements are effectively scaled within each other.

Given this idea of scale, the role of some placements can be explored at an overall macro scale. Consider that, with the possible exception of craft items, most products are created within a corporate setting. While such products may (or may not) provide a truly significant benefit to users, they ultimately exist to satisfy the requirement for corporate sustainability and growth. This leads to the interesting and open question as to the degree that the contexts of consumer need, cultural presence or corporate need dominate product development. Likely all three (and perhaps others not noted) play a role at the macro scale, in varying degrees, to inform product definition and design decisions. Another question that arises out of this inquiry is the degree to which the players involved (designers, product managers and executives, etc.) are explicitly aware of the degree to which a specific, macro scale placement may be driving such decisions. Within this milieu, the need to satisfy corporate requirements can overshadow or obscure negative characteristics of a product's role within society. An obvious example of this is evident in the many automobile recalls and lawsuits that have occurred over the years due to safety concerns. A less obvious example, but an ever-pressing concern, lies in the very sustainability of contemporary material culture, the detritus of which now touches every part of the planet (Homer-Dixon, 2001, p. 59).

Often, consideration of placements at larger scales can be implicit, vague, and assumed. Yet the values present in such considerations will find expression in establishing product role and product design. Part of understanding the values at play within these larger scales of thought requires a theoretical basis for inquiry. Theories derived from philosophy or cultural history can play an interesting role in illustrating how values are established in material culture and can inform design.

Theoretical Placement

Cultural theory can provide a type of placement active at the larger scale of concerns in developing product ideas. This notion served as the basis for an academic studio exercise undertaken to allow students to better understand the role of theory in design and to provide a basis for explicitly engaging and developing one's design thinking in complex problems. The choice of theory for this exercise was used to define an inquiry for the students that addressed the essential character of contemporary technology.

In the early part of the twentieth century and during the early days of modernism, two groups developed theoretical positions that can be seen to define a polarity of positions that addressed notions of value in material culture and technology. Each of these groups had a distinct take on technology, its relationship to humanity, its role in civilization, and how it should be expressed in art and design. The groups chosen were the Italian Futurists and the Zurich Dada.

The Italian Futurists found themselves in awe of the emerging, mechanistic technologies of the day. The Futurist included artists of all types including poets, painters, sculptors, and architects. They held a type of ruthless wonderment for technology where qualities of speed, aggression, misogyny, violence and the negation of past history were all considered to be at a pinnacle of human achievement. First published in 1909, the *Futurist Manifesto* expands on the virtues of techno-worship, effectively to the near negation of humanity. In the Futurist framework, technological failures are symptomatic of human weakness and the machine (often embodied as the racecar or airplane in their writings) represents the new beautiful and is truly supreme.

From the *Futurist Manifesto*:

1. We shall sing the love of danger, the habit of energy, and boldness.
2. The essential elements of our poetry shall be courage, daring and rebellion.
3. Literature has hitherto glorified thoughtful immobility, ecstasy and sleep; we shall extol aggressive movement, feverish insomnia, the double quick step, the somersault, the box on the ear, the fisticuff.
4. We declare that the world's splendor has been enriched by a new beauty--the beauty of speed. A racing motor-car, its frame adorned with great pipes, like snakes with explosive breath...a roaring motor-car, which looks as though running on shrapnel, is more beautiful than the *Victory of Samothrace* (Taylor, 1974, p. 95.).

The Futurists set a precedent with the bombast and rhetoric published in their manifestos, though in the end the Futurist promise seemed to be horrifically realized in the First World War. The war demonstrated quite clearly (at least to those in the trenches) that mechanized, manufactured death is not at all beautiful and in morbid irony many futurists died in the war.

The First World War spawned a number of refugees, many of who were intellectuals who found themselves drawn to European centers uninvolved in the conflict. In Zurich, one group collected around Hugo Ball and his girlfriend Emmy Hennings and called themselves Dada. Working on the publicity precedent of the Futurists, the Dadaists differed in one very significant way: they abhorred the technology that engendered the slaughter and destruction of the war. The Zurich Dada (later Dada took on different forms in Berlin, Paris and New York) felt that humanity should strive for the elemental and that art should lose any historical cultural baggage, ultimately seeking to express only this elemental nature. To achieve the elemental in their work they focused on chance, spontaneity, and the uncorrupted innocence of childhood. According to Robert Hughes, this focus meant that their work never truly became a style in the manner of other modern art movements such as Cubism or Expressionism (Hughes, 2002). Their work took on the form of

performance art that incorporated poetry, primitive music, masks, cardboard props, and simplistic costumes. They also created a body of work incorporating aspects of sculpture, collage, and found objects.

The work of these two groups marks the polar ends of a discussion on technology that resides with us today. A kind of tempered Futurism is readily evident on TV in a number of shows on the Learning Channel, the Discovery Channel, and History Channel, which address automobile makeovers, huge machines and technology used in the pursuit of war. Elements of Dada can be seen in Beat culture, the hippy movement of the 60s, and in the arrival of punk in the latter part of the 70s. It is the pervasive and continuing nature of these theories that makes them an appropriate topic choice for investigation within an industrial design studio exercise.

The Studio Exercise

Futurism and Dada came about in the early part of the twentieth century, which was a time of significant political, cultural, ideological, and social change. The studio project was set up so that students (who worked in pairs) had to first investigate the theories of Futurism and Dada. This first task required students to go beyond simply researching these theories; they also had to reinterpret them within today's social, cultural, political, and technological context. In other words they had to become *new* Futurists and *new* Dadaists. To demonstrate this reinterpretation, students were required to create an experiential 'event' that would effectively convey their theoretical position through media of their choice.

This reinterpretation constituted the first part of the project, students then had to take their newfound insights and use them to inform the design of a personal media player, the exact function of which was left up to the students.

In a relatively short time (one week) students were able to achieve both surprising and sophisticated insights into, and demonstrations of, these theories. One Dada group, commenting on the isolating nature of technology, effectively hijacked an elevator car turning it into a setting for their event. They redecorated the inside of the car to reflect Dadaist collage work and prepared custom mixed CDs for each of their peers and the course instructors. Capitalizing on the way elevator rides seem to mute conversation and on the isolating effects of individual CD players, the students in preparing completely different CDs, heightened and exaggerated the sense of isolation and dehumanizing disconnect between the occupants of the elevator.

Another group, working within a Futurist position, commandeered a small room in the faculty workshop in which they had outfitted with several computer and television monitors, fans, and sound systems. The students created their own film and media streams intended to overwhelm participants with the presence and majesty of technology. The cacophonic presentation had no discernable pattern to it, heightening the sense of mystery often associated with technology (especially hi-tech) and echoing the Futurist notion on the supremacy of technology over the frailty of people.

Within the theoretical context, students pursued projects on a variety of issues associated with contemporary technology. Insights addressed the 'dumbing down' of language due to text messaging and emoticons, finding the inner child, heightened performance in relationships and sports, the pace of technological change, isolation and disconnect due to technology, enhanced virtual experience, and fresh engagements with the urban environment. Within such contexts, the design projects took on innovative forms. One group, working within a Dadaist context, designed a personal media player intended to enhance connections between people. The device, called sHeLLs, has to be hand carried, has a limited play list and a volume ceiling. However these shortcomings are deliberate: using RF technology, if the device comes within range of another

sHeLLs unit, then play lists and volumes can be augmented. If a third or forth device come within range, then these are again further augmented. The student designers anticipate that people who own sHeLLs would likely organize in an informal way to set up large sHeLLs-based events to max out the party potential of the units.

Another pair, again working within a Dadaist framework, designed a camera-cell phone intended to hark back to one's inner child. Called Mr. Bill, the device uses a retro-based rotary dial instead of standard keys, and can be used in any orientation to dial out, speak, listen and transmit photos.

One group in the Dadaist camp developed a translation device worn as a rather large lapel button. Called TOME, the device incorporates a microphone and LCD display and is intended to monitor what the wearer says, translating it into an animated stream of emoticons on the display. Though possibly quite useful in a bar setting, the design offers a commentary on the way language is now secondary to one's engagement with technology. It exemplifies the way in which emoticons allow for speedy communication, but at the potential the cost of having something useful or worthwhile to say.

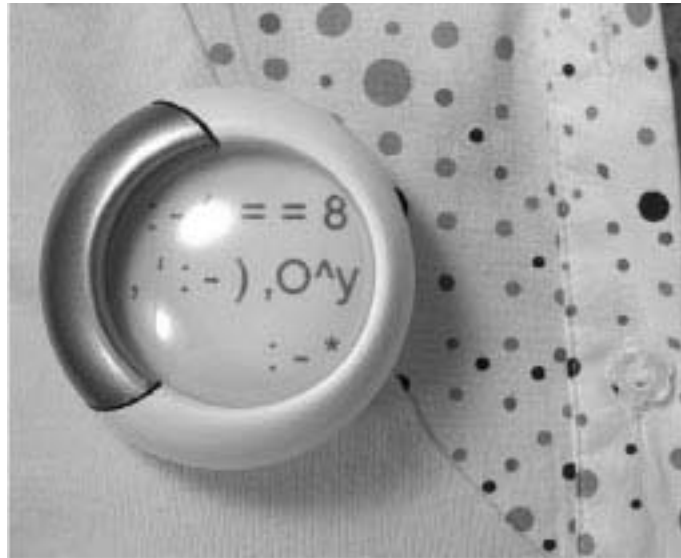


Figure 1: TOME emoticon translator

A Futurist group focused on the quintessential listening experience for their users. Their headset, Rush, incorporates sensors and LCD glass eyepieces. The sensors monitor brain activity, and as the user is better able to focus on the listening experience, sound quality increases and the eyepieces frost over, isolating the user experientially from any external distraction. Another Futurist group designed a wrist piece that was able to privately display information and transmit it over localized RF frequencies. The device allows for the discrete exchange of user profile information that could enhance one's presentation in an initial business or personal dating encounter. Another futurist effort resulted in a media player that allows dedicated athletes to better fixate on the ultimate performance 'zone' through an unexpected collection of user interfaces and sensors. One of these emits a small shock that emanates once sensor input indicates that user is in the 'zone'.

Another Dadaist group developed the design for a media player that allows users to engage familiar environments in an unfamiliar and fresh way. Named using the acronym EAS

(environmental audio system) the device consists of a disposable, pebblelike transceiver that collects audio input from a given environment and rebroadcasts it out within a localized area. A dedicated headset can receive these sounds, and using software to remix them, incorporates the newly sampled audio into musical vibes. The device allows for a fresh experience of the environment and a new type of urban connection between those who toss out the pebbles and those who receive signals from them.

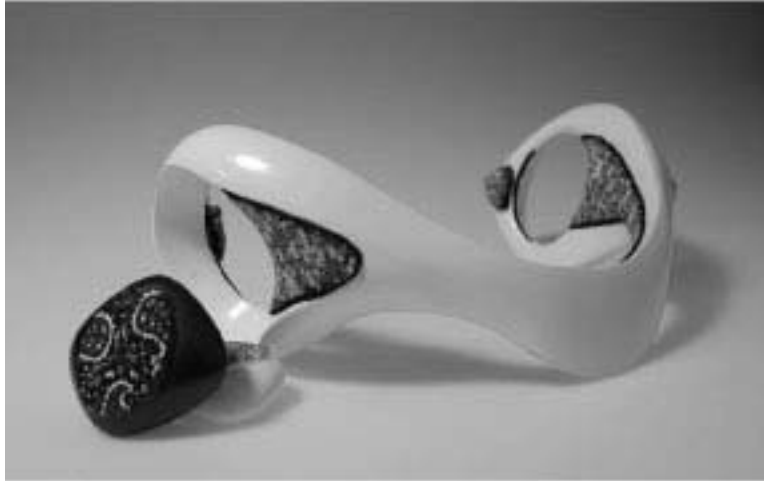


Figure 2: EAS environmental audio system

Overall, the project achieved some interesting and noteworthy results. Students were surprised to learn the continuing relevancy of Futurist and Dadaist theories in today's world. In fixing project constraints within a theoretical placement, students were forced to engage fundamental issues and values in the design of personal media devices and technology in general. The resultant design work also reflects a novelty that might not otherwise be achieved had the project brief been established in a more traditional way. The exercise further forced students to consider what exactly informs their design decisions and in this way, provided a useful experiential lesson in design thinking.

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