

Beyond Technology

EFFICIENCY, AESTHETICS, AND EMBODIED EXPERIENCE

Anijo Punnen Mathew Design Research & Informatics Lab, College of Architecture, Art, and Design, Mississippi State University

The spaces we live in are increasingly entwined in a complex weave of architecture and technology. With the evolution of intelligent devices that work in the background, design of place will eventually be a seamless integration of not just efficient but also experiential and virtual technologies. This signals a paradigm shift because “smart” architecture affords users a new interaction with architecture.

In spite of such promises, we have seen interactive architecture ideas and “smart” environments only within laboratory walls or in the form of simplistic implementations. Perhaps the reason is simple. Rachael McCann asks if the integration of technology within the context of an increasingly information-driven modern era has abandoned the body in favor of the mind (McCann 2006). If we acknowledge that “smart” computing has the opportunity to transcend an efficient backbone to generator of experiences, perhaps we, as designers, must reconsider our position and strategy in this modern world.

This paper is designed as a critical essay—one which evaluates interactive architecture and “smart” environments within the context of today’s socio-cultural climate. The paper hopes to open a discussion about the role of computing as architecture and the role of the architect in the design of such architecture.

1 INTRODUCTION

“Damiel thus enters a world of reversibility, the slow perceptual unfolding of which he can no longer gain an overview but must experience and feel his way moment by wondrous, frightening moment.”

–Rachel McCann (McCann 2006)

McCann begins her thesis with a description of the film *Wings of Desire (Der Himmel über Berlin, Wenders, Handke, and Reitinger 1987)*. Damiel is an angel, who, with the other angels, watches, listens and witnesses mortal life through the detached perspective of an immortal. But Damiel is not satisfied, he longs for true engagement. *He wonders what it would be like to feel the gentle pressure of wind, stroke the soft fur of a cat, or experience the boundary-trespassing sensation of drinking hot coffee or touching human flesh* (McCann 2006, 9).

It is only through immersion both spatially and culturally that *places* become aesthetic memories. Our shared corporeity with architecture makes it no longer an object but an equal participant in a process of perceptual unfolding which intertwines perceiver and perceived (McCann 2006). Thus it is our places that are defined by the lives we live in them, not *vice versa*. However, with the coming of the modern era, we live a dualistic life—one defined by the desires of our inner being and the other governed by the efficiencies of modern living. As a culture, we have changed. *We have become voyeurs* in a world that demands *participation*. And as designers, we continuously seek the “image” of *space*, and forget the “experience” of *place*.

Damiel eventually discards his angelic form and enters the world through a human body—giving up his immortal overview for mundane embodied existence. The example of Damiel implicitly brings to light, what McCann calls, the dilemma of modern existence (McCann 2006). This essay re-asks her question within the context of ubiquitous computing and “smart” architecture—how do we regain a sense of immersion in a world seemingly driven by the Cartesian dualities that have enabled our technological achievements?

In the following parts of the paper we will use this premise to derive an understanding of interaction design in the context of both the original ideas of *aesthetics* and the modern hedonistic concepts of efficiency. We will weave in and out of philosophy, technology and design to discuss why the incorporation of aesthetics and embodied experience into the design and expression of “smart” environments is essential for its acceptance as a viable artifact for inhabitation.

2 EFFICIENCY

Media and technology have transformed our lives - once entangled in complex webs of cultural phenomenon, our understanding of culture has been reduced to bite size thirty second/one minute tidbits. Cultural symbols increasingly revolve around smaller and smaller units of efficiency. Efficiency has replaced experience as the catch-all reference for our lives.

At home, we live in *cultural efficiency*—our lives increasingly finding definition in technology—radio, TV and DVDs replace a trip to the theatre or the fair; personal music devices (iPods) replace books; the World Wide Web replaces the local coffee shop.

Outside our homes, stores like Wal-Mart and Target scream *economic efficiency*—buy more, pay less! Our work is made easier with *technological efficiency*—the subway takes us to work faster; post-it-notes replace human connections; emails replace post-it-notes. And finally our environments are festooned with *aesthetic efficiency*—the design of suburbia echoes the architectural genome of thousands of others; the aesthetic of Wal-Mart tells customers that they can find quick and cheap shopping.

Popular culture reflects this—Wired Magazine recently had a cover story called *Snack Culture* which described how information has become more compact in a culture that continues to grow busier. Magazines like TIME have revised their graphic/content layout to include *snippets* of information—articles (significantly) shorter than normal. *The Daily Show* and personal web logs have become portals for information exchange in a world that grows flatter every passing moment.

All of this leads to an increasing commoditization of *experience*. In our current socio-cultural set up, the next competitive advantage will be in those enterprises that can *stage* experience within the boundaries of an efficient lifestyle. Joseph Pine and James Gilmore *echo* this in their seminal article, *Welcome to the Experience Economy* (Pine and Gilmore 1998). They claim that in the current *experience economy*, experience itself has become an economic offering. A good example of the experience economy is Starbucks, a company whose economic model depends on differentiating the *experience* of drinking coffee from the *efficient process* of drinking coffee, and makes money doing so.

While the above paragraphs may seem like a criticism for our modern lifestyle, it is not. Rather, it is simply a reflection on the socio-cultural references of the postindustrial age we live in today. Such references are important to frame the discussion that follows. And to establish this reference, we must first understand that this life is a result of significant scientific-cultural events that happened centuries ago.

2.1 HOW COPERNICUS CHANGED OUR WORLD...

“all things being equal, the simplest explanation must hold true”
 –Ockham’s Razor

William of Ockham in the 14th century posited what is now famously known as Ockham’s Razor. Ockham’s Razor is the cornerstone of science—the single most important derivative that has driven scientific temper to date. Ockham’s Razor allowed us to question our universe and look beyond pure philosophical existence into an existence of pure understanding. Under its auspices, many significant discoveries were made—Copernicus proposed the heliocentric theory; Galileo pioneered the use of quantitative experiments; Newton discovered gravity, and so on. What all of this did is quite profound; with science bypassing experience for rational quantification, we revealed to ourselves a world of quantifiable phenomenon—vastly different from the imagined world of religion and fantasy that existed before. Copernicus and the others had *demythified* our lives. The age of reasoning had begun—the church began to lose its power as a political regime and science took over as the catalyst for human advancement. But as science was glorified, we lost our poetry—our ability to seduce ourselves. The *fact* that the earth moves took precedence over our *experience* that the earth is fixed (Pérez-Gómez 2006).

2.2 “PLACE” IN AN EFFICIENT WORLD

As modern socio-economic and cultural principles permeate our lived experiences, it is only prudent to assume that architecture too will be driven by such models. Alberto Pérez-Gómez claims that for a hedonistic culture, architecture’s primary intention is to ensure the greatest pleasure and the least pain for each individual. Modern hedonism expects instant gratification (Pérez-Gómez 2006) because while renaissance creation was accomplished using embodied consciousness, modern creation depends increasingly on rational ego.

Following the renaissance and the industrial revolution, the dominant *maker* (of place) was the engineer, the new aristocrat of the nineteenth century—as a technical specialist he could plan, control and transform the world by implementing instrumental theories (Pérez-Gómez 2006). Today’s designer/architect is not a descendent of the master builder; she is the descendant of the engineer. In her powers are vast technologies that enable scientific reform. Her designs promote efficiency over experience—models that are understandable because they are quantifiable, hence legitimate and accepted in the scientific community (McCullough 2004).

While philosophy likes to argue that embodied expe-

rience is the fundament of architecture, the truth is that design methods transform creative processes into objective, explicit and efficient *methods*—those which assume a privileged relationship between the representations of knowledge and that of thinking; which treat complex behaviour as reducible to measurable variables (MacCarthy and Wright 2004). As a result, contemporary culture seeks *artifacts* that provide efficient shelter as opposed to *places* that seduce us (Pérez-Gómez 2006).

Technology in an efficient world is also reduced to understandable and explicit terms. Through its universal definition as the means to our ends, we make practical distinctions between technologies that are *tools for* our experiences and those technologies that *form* our experiences. If such distinctions are extrapolated into the architectural sphere the reason why “smart” architecture is neglected can be attributed to the simple fact that we perceive these “technologies” to be efficient systems working to provide us with a painless, efficient lifestyle. All humans, regardless of culture, age, wealth, or social status suffer a *lack*—a desire for something beyond simply living a life bound by four walls (Pérez-Gómez 2006). Thus when “smart” environments become technologies for efficient living, they no longer satisfy our longings. For this, they must be a design of seduction—of both our body and mind. True architecture engages the inhabitant as a *participant*, not as a remote spectator and reveals itself gradually, *erotically* (Pérez-Gómez 2006). Places which people find meaningful are not extraordinary or of award winning design or fame. Rather, they are ordinary places that are experienced in everyday life. The relationship to these places is a life-long phenomenon, one that develops and transforms over time, such that past experiences influence our current relationships to places (Manzo 2005). What they often share is a conscious and constructed reference to other places, taking advantage of the link between memories and experience—an engagement we call aesthetics.

3 AESTHETICS

“Poetry is not born from rules...rather it is the rules that derive from poetry”
 –Giordano Bruno (Pérez-Gómez 2006)

Aesthetics is beyond philosophy; it is lived experience. Aesthetics is the perception of our world—created not *ex nihilo*, but re-lived from precedents. The aesthetics of an artifact cannot be understood without understanding the socio-historical dimensions associated with that artifact. John Dewey claims that to understand aesthetic in its ultimate and approved forms, one must begin

with it in the raw, in the events and scenes that hold the attentive eye and ear of man, arousing his interest and affording him enjoyment (Dewey 1959). McCann's reading of Merleau-Ponty suggests that *raw sensation is the constant and unfiltered flow of sensation. Amid this flow, perception is a differentiating act, plucking bits of raw sensation out of the undifferentiated background of the sensible world, and apperception then ascribes meaning to that perception* (McCann 2006, p.23).

For our purpose, let us use a pragmatic example to understand this precept: our experience with an *artifact* (architecture, design, product, technology) is different every time we interact with it. In fact even the first time we interact with an artifact, we bring to that interaction memories of past experience. This describes and influences our perception of the artifact. After the first interaction, we step away from the artifact and interact with the rest of the world. While we are immersed in our socio-cultural context, that too is changed *because* of our interaction with the artifact. Every subsequent interaction with that artifact is different from the first because our perception of the world has been *changed* by our experience of the artifact and its presence in our life. And because our ability to engage in an aesthetic experience is the result of such social contexts and our own intellectual abilities, the manifestation of an aesthetic experience is prolonged beyond the immediate exposure. Hence, the aesthetics of a chair is not defined merely by its design, instead it is defined by our perception of that design. This perception is a constant revival of a history of past experiences and memories and the aesthetics of the chair lingers in our modal systems beyond the singular instance of our interaction with it (Mathew 2006).

Beyond the mere ascribed use that is afforded by an artifact, aesthetics has the ability to surprise and provoke and to move the user to a new insight of the world (Petersen et al. 2004). Aesthetics is design; design is aesthetics. It is not singular but plural in both definition and experience. It gains meaning only from its situation—connected to other artifacts and events and the perception of the user. It cannot be expressed in quantifiable terms, in one visitation or use. Instead aesthetics must be lived over and over again until one is able to perceive it and finally appropriate it.

3.1 AESTHETICS IN AN EFFICIENT WORLD

After the nineteenth century, functionalist theory rejected theories of character and assumed that meaning would simply follow the efficient solution to a pragmatic problem. This resonated with the scientific and industrial establishment of the day. With the development of the machine to “make,” the role of the craftsman was

relegated to that of a *producer*. Industrial design was in part responsible for this change, through mass production the number of standardized products multiplied, leading to what has been called, the assembly-line process. The inherent relationship of design ideation and making (i.e. manufacturing) naturally generated an interwoven relationship between the “design” idea and the “machine” of parts and assemblage (Kumar 2006).

However, mechanization transformed *aesthetics* not only into a rational attribute of design but it also gave it a more consensual and democratic outlook. Today's designers must consider the impact of their work on the environment, culture, society, technical system, and any other system with which the product of a design process might interact (Pobiner and Mathew 2007). This is evident in architecture as well; architecture tends to occupy either the transparent space of technology or the inaccessible space of art, not both. It is conceived as a practical building or as an applied ornament. When poetic “making” is found revealing itself through the cracks of materialistic efficient “making” it was always as a strategy of resistance (Pérez-Gómez 2006).

In short, aesthetic has become *one* of the “functions” of the artifact. No longer is aesthetic an *experienced* attribute, developed over time by an individual; it is defined merely as a “style” which has to be blatant in both design and expression. This explains why our methods for the design of “smart” environments are finite, distanced from the original concepts of aesthetics which involved embodied experience.

4 EMBODIED EXPERIENCE

“Isn't it strange how this castle changes as soon as one imagines that Hamlet lived here? As scientists we believe that a castle consists only of stones, and admire the way the architect put them together. The stones, the green roof with the patina, the wood carvings in the church, constitute the whole castle. None of this should be changed by the fact that Hamlet lived here and yet it is changed completely. Suddenly the walls and the ramparts speak quite a different language...”

—Niels Bohr to Werner Heisenberg at Castle Kronberg (Tuan 1977)

Environmental psychology categorizes “physical environment” as “typically neutral,” only coming into self-conscious awareness when individuals form stable and enduring representations of it. In our everyday dealings with the world, we fundamentally take it—*for granted* that there simply *is* a material world existing independent of us; it is our interaction in these places

that give meaning to the settings (Auburn and Barnes 2006). Moreover, not all experiences are corporeal—often have “real” experiences in “virtual” spaces. These experiences stem from our imaginations and our fantasies; for example, a child’s play structure may become a pirate ship; an elaborate theater set may become 18th century England. Thus, the experience of architecture becomes an inescapably embodied act requiring immersion by the participant. Since this embodiment also includes the ability to reflect and ideate, we constantly seek to understand our experience of architecture by assigning it meaning. Yet, given architecture’s material and sensuous nature, we must find ways to access meaning without disregarding our interaction with architecture’s sensuous content (McCann 2006). In short, because “place” is an accumulation of experiences, while “space” is merely the construct that envelops it, design of architecture (place) is the design of the underlying experience.

4.1 DEFINING EXPERIENCE

But defining experience is difficult. It is difficult because we can never step out of it and look at it in a detached manner (MacCarthy and Wright 2004). Our experiences use all of our five sensory organs as well as thinking and memory. An experience is lived at the moment but it is relived over and over through our narratives and stories. We are able to define *other’s* experiences through our own perception. We construct our lives on experience; we interact with others on experience; and we interpret our elements through experience. Because of this, experience becomes an abstract “quality” for us, impossible to define in quantitative terms.

The best we can do is describe/define the *ways* in which we experience. Many authors have tried to do this in the past. For this paper, we will look at experience from three perspectives.

In the first, (from the viewpoint of the participant) Forlizzi and Battarbee categorize experience into three unique types:

1. *Experience*: Experience is how we constantly assess our goals relative to the people, products, and environments around us: walking in a park, doing light housekeeping.
2. *An experience*: An experience has a beginning and an end, and often inspires emotional and behavioral changes in the person who experiences: going on a roller coaster ride, watching a movie.
3. *Co-experience*: Co-experience is about user experience in social contexts. Co-experience takes place when experiences are created together, or shared with others: interacting with others at a museum, commenting on a friend’s remodeled kitchen (For-

lizzi and Battarbee 2004).

In the second (from the viewpoint of experience), Pine and Gilmore categorize our experiences into four types:

1. *Entertainment*: The connection of the participant is more likely one of absorption than of immersion: watching television, attending a concert.
2. *Education*: The experience involves more active participation but participants (like students in a lecture) are outside the event rather than immersed in the action: attending a class, taking a ski lesson.
3. *Escapist*: These can be like the above two but involve greater participant immersion: acting in a play, descending the Grand Canyon.

Aesthetic: Here the participants are immersed in an activity but they themselves have little or no effect on it: a tourist who views the Grand Canyon from its rim, or a visitor to an art gallery (Pine and Gilmore 1998). In a third (from the viewpoint of the body), derived from Pérez-Gómez, there are two categories of experiences:

1. *Corporeal*: deeming the actual presence of the participant within itself (most architectural experiences are corporeal): living in our homes, walking in the city of London.
2. *Voyeuristic*: “visitations,” either virtual or physical, to a place or event characterized by its ephemeral quality: visiting a building as a tourist, viewing a city (virtually) on the computer, or (a child) making a spaceship out of a bunk bed.

It is evident from the above, that there is a complex relationship between how we experience places and our interactions with or in them. Technology gives the architect a freedom—freedom to break away from the boundaries imposed by material and spatial limits. And we as architects are constantly using architecture as an interface to design interactions.

The idea of architecture as an interface is not new; it has found profound use even before the birth of computing. The interiors of a church define its place as one for reflection or religious gathering. The bricks and ivy of Harvard Yard signifies years of scholarly research and education. The solid grey walls of a prison conjure up images of torture and punishment. The bright colors of a playground indicate play and joyfulness. Thus, ever since humans have existed, our environments have been acting as interfaces for information interchange. The difference today is that, as computers slowly recede into walls, tables and furniture, we now have in our repertoire new tools of computing and multimedia. Now, for the first time, users can interact with information, change the way it envelops their existence, search for more or better information, communicate their needs, and expect a reaction (Mathew 2006).

4.1 THE PROBLEM WITH COMPUTERS

As technology ubiquitously penetrates our lived experiences, Human Computer Interaction (HCI) is shifting from creating task and work oriented experiences to other kinds of experiences. And for HCI designers, the understanding of qualities of experience will be crucial in the construction of principles underlining the design of (future) interactive spaces. The problem is however that the computer is digital—always offering a yes or no solution. When you try to tie these two systems together (one inherently experiential, the other inherently efficient), computation resists the phenomenological qualities of architecture and vice versa. Thus, most “smart” mediations are found lacking because they are attempts to improve efficiency, not the experience of inhabitation. They become “computer programs” and devices that mechanize process, not that which enhances imagination. Inherently our definition of “smartness” remains limited to sensors that detect temperature and open windows or systems that adjust lighting in a space to optimal illumination levels. Also, most results of user studies/product testing surprise HCI designers—they find people using tangible interfaces in ways that the designers never imagined it would be used; inventing new ways of enhancing play with even mundane interfaces (Churchill, Nelson, and Hsieh 2006). Rogers claims that the truth about ubiquitous computing in its naïve and infantile form is that it has only managed to *intervene, clumsily, in situations that already work reasonably well* (Rogers 2006, 407).

5 BEYOND TECHNOLOGY

HCI designers almost always assume that if a pragmatic problem has been solved through an efficient use of technology, users will always deem it as appropriate. On the contrary, most such solutions are a compartmentalization of our senses and perception. It limits us to understanding the situation *as is* without giving us the flexibility of abstraction or reliving the experience outside the sphere of our interaction. It is such compartmentalization that McCann and Dewey claim decisively divides the person into the body and the mind.

So what is the solution? Perhaps the answer is to look *beyond technology*. Other media have done this in the past. Painting in the face of extinction from new technology (photography), evolved a renewed frame of reference—abstraction. Cinema evolved from being the mere representation of our mundane lives to poetic renditions and fantastic imaginations characterized by experimentation. As technologies, both paintings and cinema still do the same thing that they were designed to do, yet they reveal abstraction using completely different ideologies and theoretical premises; they go beyond

simply the technological content that governs them. McCann claims that architectural design, in comparison, offers opportunities for inter-corporeal engagement unparalleled in painting [or cinema] (McCann 2006). Are we as designers missing such opportunities?

5.1 DESIGN EXPERIENCES, NOT ARTIFACTS

We have to start thinking of computation *as* architecture instead of computation *in* architecture. We have to start viewing computation as the “whole” instead “parts” of an aesthetic system. Within this basic premise, it is important that we devise methods such that it is not the technology but the experience (*place-ness*) created by the technology that is in focus. Using the thinnest layer of computing required, we have to design *situations* or *levers* that people can interact with, while at the same time avoid neatly predicted outcomes (Forlizzi and Ford 2000). As MacCarthy and Wright suggest, our designs must bring forth a rhythmic dance of aesthetic experience where the self and the world achieve significance (MacCarthy and Wright 2004).

5.2 SEDUCE, NOT CONTROL

“Once one bites the apple the desire is gone; we cannot want that, and yet we do”
—Anne Carson (Pérez-Gómez 2006)

Architecture in its very essence is a continuous seduction of the user. Only in its gradual unfolding does architecture reveal to the user its intimate secrets. Voyeuristic experiences carry vastly different experiences for users than corporeal ones. The contradiction however is that as rational solutions, architecture must also be able to serve the purpose for which it was designed. Thus, our designs must delve on the edge—where they can be beautiful and seductive but also pragmatic and useable. For only through our participation as both subjects and objects within the context of architecture, are we, as sensuous beings, able to feel, imagine and narrate this essential quality of architecture. The challenge for the designer is thus to design spaces that are useful, yet not readily consumed (Pérez-Gómez 2006).

5.3 ALLOW FOR PLAY, DESIGN FOR STORYTELLING

As sensuous beings, we experience “place” as *self*, yet our sensibility of this experience is defined by our relationship with the *other*. In other words, we assign two distinctly different meanings to spaces—one intrinsic, the value of the event for self; and the other extrinsic, the value of the event as a social being in a social context. This is the reason why experiences are always recounted as narratives or stories. Narratives permeate

experiences as they are lived. They dominate the process of making experiences meaningful for us (and others) afterwards. Narratives need not be self referential or an exact recounting; in fact they are selective re-interpretations, constructed for a purpose and an audience (MacCarthy and Wright 2004).

Designing for narrative is difficult. Yet such is the call of designers. An enthused effusive participant is one who has had a playful and interactive experience with the design. In other words, the perception and propagation of design lies at the limits of primal interactions and linguistic expression. Our interventions, however pragmatic, must allow users to transcend into child like states where play and interaction overshadows the inner trapping of efficiencies. And only through an engagement of the user as a primary participant of such play can our designs transform from *space* to *place*.

6 CLOSING CONVERSATION

In conclusion, we must understand that in an efficient world, a seductive environment is one that marries efficiency, aesthetics and embodied experience in a synchronized yet irrational manner. In this critique, we have seen how our lives have become more hedonistic in an efficient world. We explored how the concepts of aesthetics have evolved over time and why it is important to question our aesthetic sensibility in the modern era. We looked at experience as the key to aesthetic perception and evaluated the fact that only through embodiment can we as sensuous beings give meaning to places. Finally, we looked at architectural computing in its infantile form and discussed why it is important for interaction designers to look beyond technology.

The good news is that HCI continues to evolve - researchers are now looking beyond the methodical construction of systems to the theory behind such constructions, questioning why something should be the way it is. This paper is a step towards such a framework in "smart" *architecture*. It is perhaps of import to conclude by saying that this essay is intended *only* as the beginning of the critique. There must of course be criticism and counter criticism, without which we will continue to develop systems and designs without dialogue, without questioning.

It is important also to note that this critique does not mean that we should stop designing technologies that solve our everyday problems. On the contrary we should use technology in every niche that demands it. For most designers, there exists either a disconnection or a feeble connection between the real world and the aesthetic. In truth, as architects we have to start drawing multiple connections between the two. In an increasingly scientific and rational world, we have to achieve a

balance between poetry and science, between efficiency, aesthetics and the embodied experience.

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