
TANGIBLE/TOUCH INTERFACES VERSUS THE REAL WORLD

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The following paper was an assignment written in March 2009 for Dr Jeffrey Bardzell's experience design course at Indiana University.

First, it is imperative to know that I am a tactile person. It is important for me to caress the velvety softness of a rose petal with the pad of my finger, or brush away the rubbery eraser dust from a page of notes with the side of my hand. Second, I adore working with my hands. When I am not working on school projects that chain me to a computer, I am busy painting, sketching, sewing, playing violin, even renovating furniture.

This need to experience physically that with which I'm working ignited my interest in tangible and touch user interfaces. In Ishii's introduction to tangible user interfaces (TUIs), he claims TUIs "take advantage of our natural ability to understand and manipulate physical forms while harnessing the power of computational simulation" (36). Excellent, my hands can have an active role and I can still "harness the power" of the computer. It seems such an easy leap to switch from working with real world objects to working with TUIs, but it is no such thing. TUIs like David Merrill's siftables and U-Touch's virtual air hockey as they exist now cannot replace their tangible predecessors. Their hypermediated existence relies on experiences which, for



FIGURE 1: PAINT CAN SIFTABLE EXAMPLE

me, are materially and sensually richer.

For an example of tangible user interfaces, let's look at David Merrill's siftables, the "thinking" toy blocks, as he unveiled them during the February 2009 TED Talks. As seen in Figure 1, siftables are little computers meant to resemble children's building blocks; they are rounded plastic blocks with LCD screens measuring approximately two inches diagonally. When a siftable block is in the vicinity of another, it reacts according to its programmed properties. The pictured example demonstrates how a tilted "paint can" siftable "pours" into a receptacle siftable, and the color mixes with whatever "paint" already exists within the receptacle.



FIGURE 2: VIRTUAL AIR HOCKEY

As seen in Figure 2, an example of a touch user interface is U-Touch's virtual air hockey table. The virtual air hockey table is composed of a digital "puck" which bounces across the screen, much like the old Atari game, Pong. The two game participants use their fingers as air hockey mallets to block the puck from entering their "net," thus preventing the opponent from making a goal and scoring a point.

While these interactions are innovative, I remain less than impressed. The paint can demonstration highlights one of the issues I have with TUIs, being that much of the tangible experience is still hidden behind a screen. As stated by Bolter and Grusin, remediation is supposed to "convince consumers that the new medium improves on the experience of older ones" (68). Neither example comes close to improving their respective tangible experiences.

In terms of the siftable example, the paint can siftable remediates the *idea* of a paint can, yet loses one of the paint can's important physical properties, weight. Part of the painting experience includes knowing how

much paint is available by holding the can and comparing its current weight to how heavy it was when bought. This helps determine how to hold the paint can while pouring, to prevent spillage.

Now, since this is a digital paint can, perhaps this property isn't as important for other users. Technically, the amount of digital "paint" is limitless, and therefore impossible to simulate its weight, which follows Bolter and Grusin's claim that remediation isn't a "replication or mechanical reproduction" (73). Still, because this is a tangible representation of a paint can, I miss the weight property. By hiding the material properties behind a screen, I lose the opportunity to use my senses, which orient me to the "concrete, palpable, and visceral" (McCarthy 80).

There is something sensually fun about picking up the paint can to gauge how much paint is left. There is a rhythm to shaking the can to ensure smooth application of the paint; I can feel the paint sloshing, as a tide along a shore. The siftable reduces this experience to a simple motion that does nothing but change the visual color tint property of the receptacle siftable. We've lost the physical interaction that allows us to "participate and communicate" with the paint can and the paint within (McCarthy 80).

Gone is the paint smell, either soothing or irritating to the nostrils, which confirms the type of paint we are using: water-, latex-, or oil-based; gloss, semi-gloss, or flat. Gone is the frustration of getting the paint all over your hands, having missed the receptacle completely if you poured too quickly or carelessly. Gone is the fun of wiping the paint onto your friend who was kind enough to help you paint in the first place. It's the loss of simple, whimsical interactions like playing around with the paint which make the siftables example materially and sensually lacking.

However, if comparing the siftable to existing *digital* representations of paint cans, such as those within Adobe Photoshop or Microsoft Paint, the siftable is, actually, an improvement. The siftable makes the digital paint can analogy more "immediate" and therefore "transparent," so the feeling is more "authentic" (Bolter 70).

It is easy to imagine myself using this siftable to "dump" a color onto the canvas, rather than relying on a series of mouse clicks to accomplish the same task. Not only is it easy to imagine myself doing that, but I can see myself enjoying the experience, comparatively, than having to rely on a mouse or even a pen stylus. I can also see myself using this tool to more accurately create a desired color, rather than relying on the predetermined color value scale within the Photoshop/MS Paint programs.

Perhaps this isn't the goal of the siftable, to completely replicate the tangible manipulation of an actual paint can, or mixing liquid paint. But if a closer replication of the tangible experience isn't the goal, then why not? Why create a tangible interface at all?

Similarly, the virtual air hockey table removes all of its material properties behind the touch screen, reducing the game to a visually improved version of Atari's Pong. There are literally no material properties to this game, except for the LCD touch screen, which seems distant and cold.

Why distant and cold? The material reduction of the air hockey game reduces the sensual experience to a finger. Again, this new media has removed the idea of physical and sensual "participation and communication" (McCarthy 80). We have little to no "breaking down of barriers between self and object" with the virtual version (McCarthy 82).

Gone is the hockey puck flying across the table threatening to smash into your knuckles if you aren't quick enough to volley, which you are able to sense through sight, sound, and of course, touch. Gone is that innate connection that comes from hours of practice, where the mallet becomes an extension of your arm so that you don't have to think of where to move your hand, you simply know, you use your "visceral eye" and give in to a "moment of gut reaction" to determine where the puck will soar next (McCarthy 97).

Gone are those delightful (or terrifying) whooshing and humming sounds that come from the pressurized air that causes the puck to glide across the table. Gone is the light smell of oil which keeps the machine that powers the pressurized air running smoothly. Gone is the inherent danger for the people watching, in the unforeseen event that the puck shoots off the table in their direction.

In contrasting these two technologies, I have to admit that I prefer the siftable over the virtual air hockey, because of its tangible factor. When using a siftable, I can imagine I am actually pouring paint from a can into a tray, attempting to get the exact color I'm looking for. I miss the other sensual elements that come with working with real world paint, yet, at least the siftable allows me to do some of the familiar motions that its digital predecessors removed from me. The virtual table, on the other hand, faithfully replicates the shallow experience of playing air hockey, but removes all other sensual factors that actually make the game fun.

Why is it that I care about certain sensual factors over others? Why do I care more about the motions of the siftable over the motions of the virtual table? Perhaps it is because of my artistic hobbies. It is more important to me, overall, that I retain the artistic sense of working with art materials versus retaining the sensual spirit of a game. For someone else, it could be that the opposite is true, that the sensual qualities of the game are more important than the artistic sense of working with art materials.

Technologies such as the siftables and the virtual air hockey table attempt to remediate their predecessors: literal physical paint cans and digital paint cans from Photoshop; Atari's Pong and the physical air hockey game. While they partially succeed, at least in terms of a shallow, "that's cool" type of interaction, I believe there needs to be more focus on the little sensual details in order for these technologies to compete with their predecessors. Until that happens, their predecessors will continue to hold a richer experience, making it difficult to prefer the newer technologies.

WORKS CITED

Bolter, Jay David and Richard Grusin. Remediation: Understanding New Media. MIT, Cambridge, MA, 1999.

Giant Multi-touch Air Hockey. U-Touch, February 2009. http://www.youtube.com/watch?v=3jxbS1c_HU4, 0:41. Accessed March 3, 2009

Ishii, Hiroshi. 2008. The Tangible User Interface and its Evolution. Communications of the ACM 51, 6 (June 2008), 32 – 36.

McCarthy, John and Peter Wright. Technology as Experience. MIT, Cambridge, MA, 2004.

Merrill, David. Siftables: The Toy Blocks that Think. TED Conference, February 2009, Long Beach, CA. <http://www.youtube.com/watch?v=JP0w9lZoLwU>, 7:10. Accessed March 3, 2009.