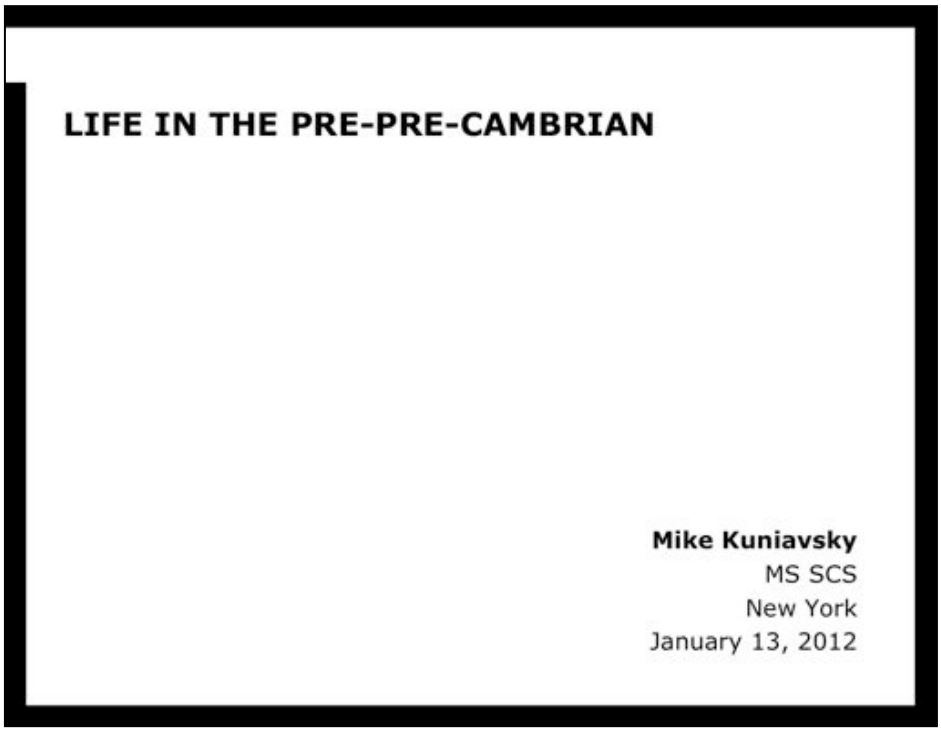
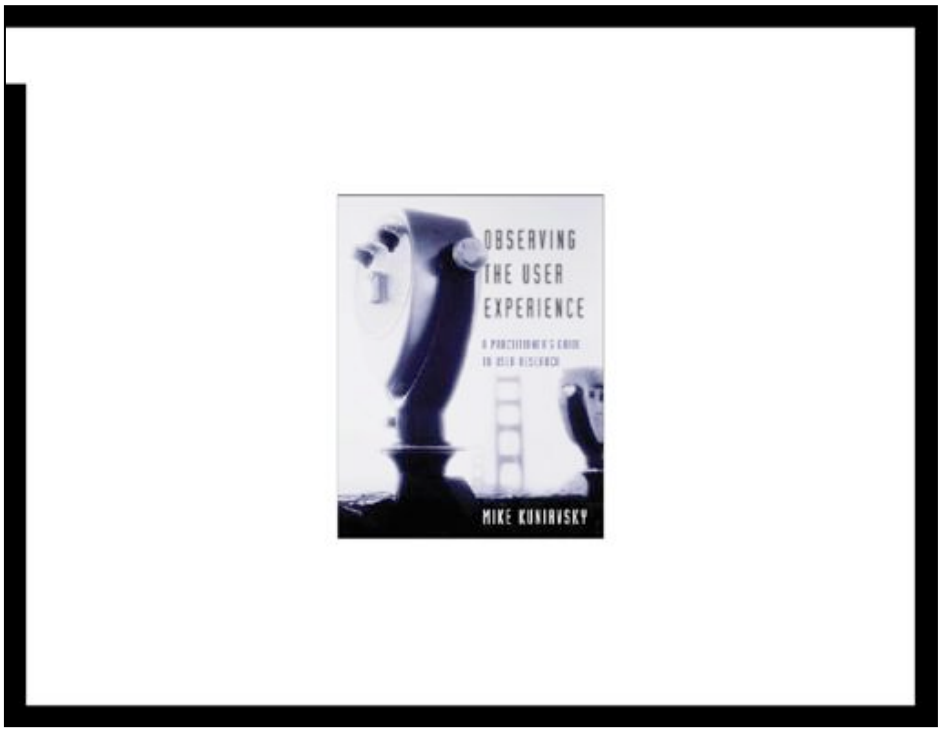


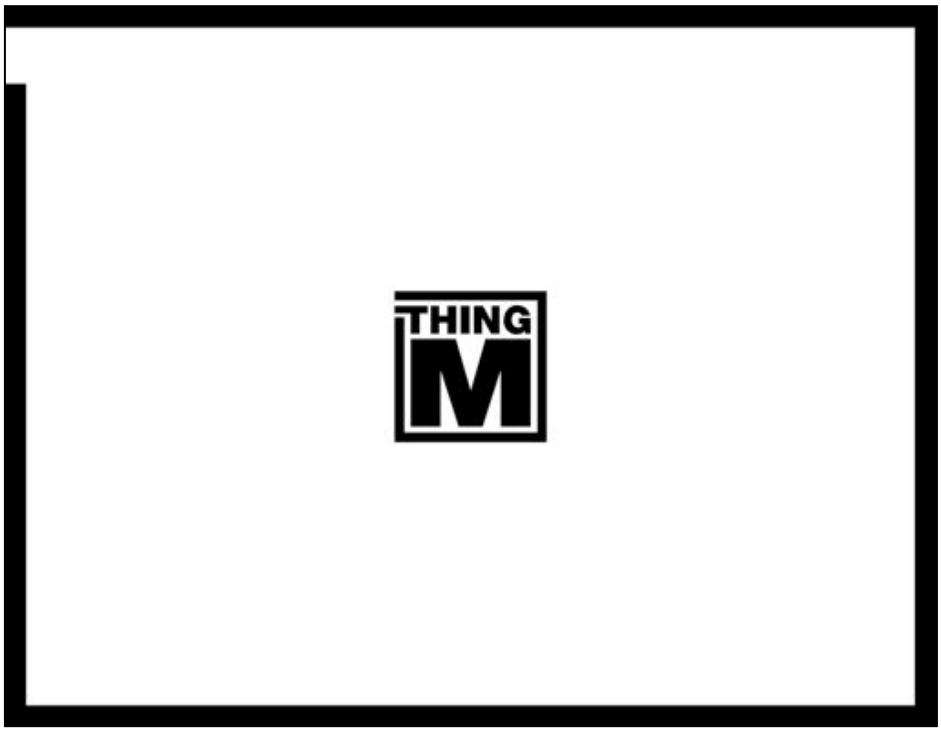
Good afternoon. Thank you for inviting me.

First, let me tell you a bit about myself. I'm a user experience designer and entrepreneur. I was one of the first professional Web designers in 1993. Since then I've worked on the user experience design of hundreds of web sites. I also consult on the design of digital consumer products, and I've helped a number of consumer electronics and appliance manufacturers create better user experiences and more user centered design cultures.

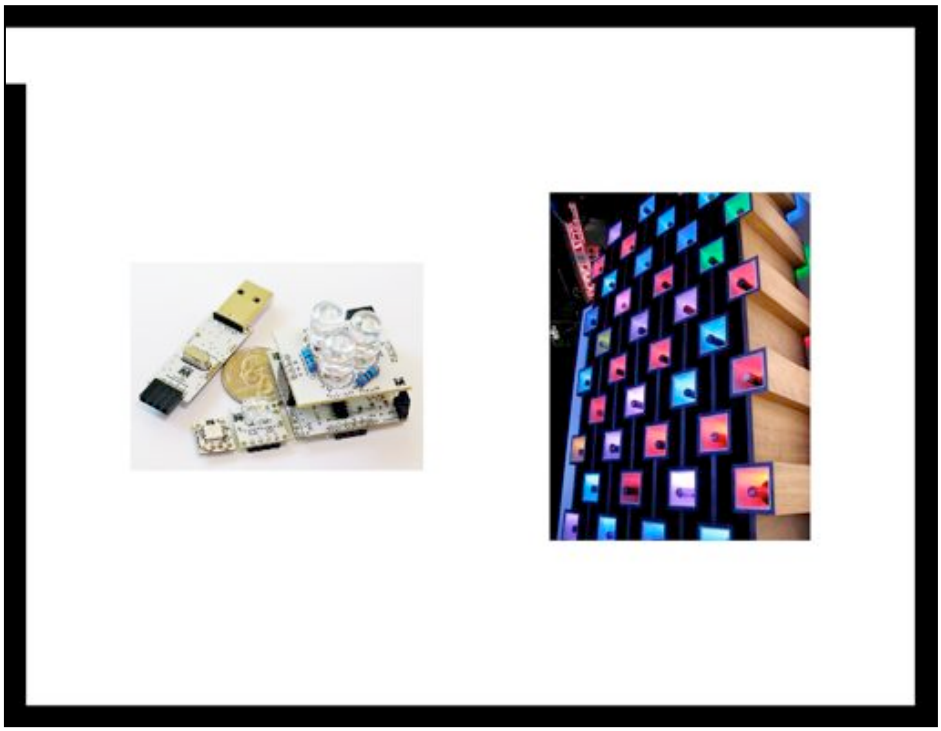


In 2003 I wrote a how-to book of user research methods for technology design. It has proven to be somewhat popular, as such books go.

Around the same time as I was writing that book, I co-founded a design and consulting company called Adaptive Path.



I wanted to get more hands-on with technology development, so in 2006 I founded ThingM with Tod E. Kurt.

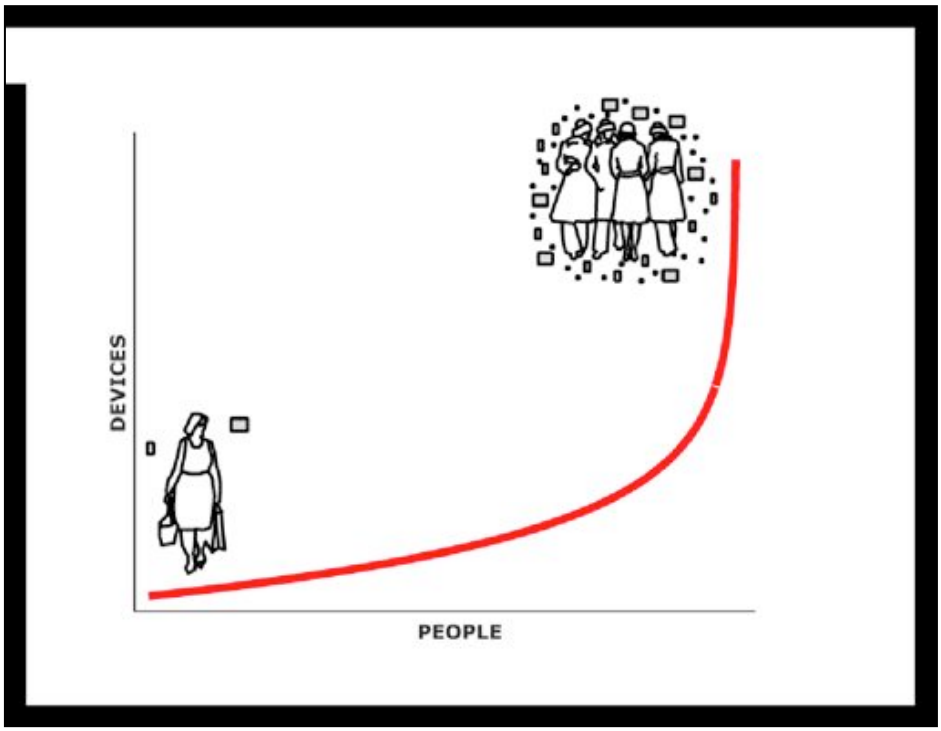


We’re a micro-OEM. We design and manufactures a range of smart LEDs for architects, industrial designers and hackers. These LEDs reduce the cost of including RGB light into projects from days to minutes, they’ve been somewhat successful as such niche components go. It has been quite exciting to design both the user experience of a component and a company.

I also organize an annual event called Sketching in Hardware, sometimes with Matt here as cohost, on the development of electronic hardware toolkits for non-engineers. In the five years we've held the event I believe we've had a significant part in lowering the barriers to entry into hardware development for designers, artists and students. Just last month Fred Martin, one of the participants last year, brought a group of Indian students from knowing nothing about hardware to building functioning robots in under a week using Arduinos and the other tools he picked up at Sketching.

Crowdlight is my newest venture, founded a couple of months ago, again with Tod Kurt and now with Ashwin Gulati. This is another hardware startup that we are bootstrapping through ThingM. I am very excited about it, but I can't talk about it in public. Talk to me offline if you'd like to hear about it.

I also recently wrote a book called “Smart Things”. In the book, I describe an approach for designing digital devices that combine software, hardware, physical and virtual components. I have some copies here. Please feel free to leaf through them, and if you like it, keep it.



I'm not a social scientist or someone who has designed much social software, so I decided to take the opportunity of this invitation to think a little bit about how the design of devices changes as the number of devices a person has grows.

When people talk about ubiquitous computing, they're usually talking about this world, once where everyone has access to dozens or hundreds of devices. However, we're not there yet. We're down here, in the beginning of the up slope from this point. Today many people are connected to many people, but only through a couple devices. We are, however, adding new devices on a pretty regular basis and as with all technological progress the length of time between new devices within this category is shrinking. This is a critical moment in the history of ubiquitous computing because it's here where many of the archetypal uses, the longstanding killer apps, will first be invented. So in other words, the seeds of the Internet of Things is being planted in the time of the LAN of things, which is the era we're entering.

I want to talk about a couple of forces that I think are driving the design of objects in this world.

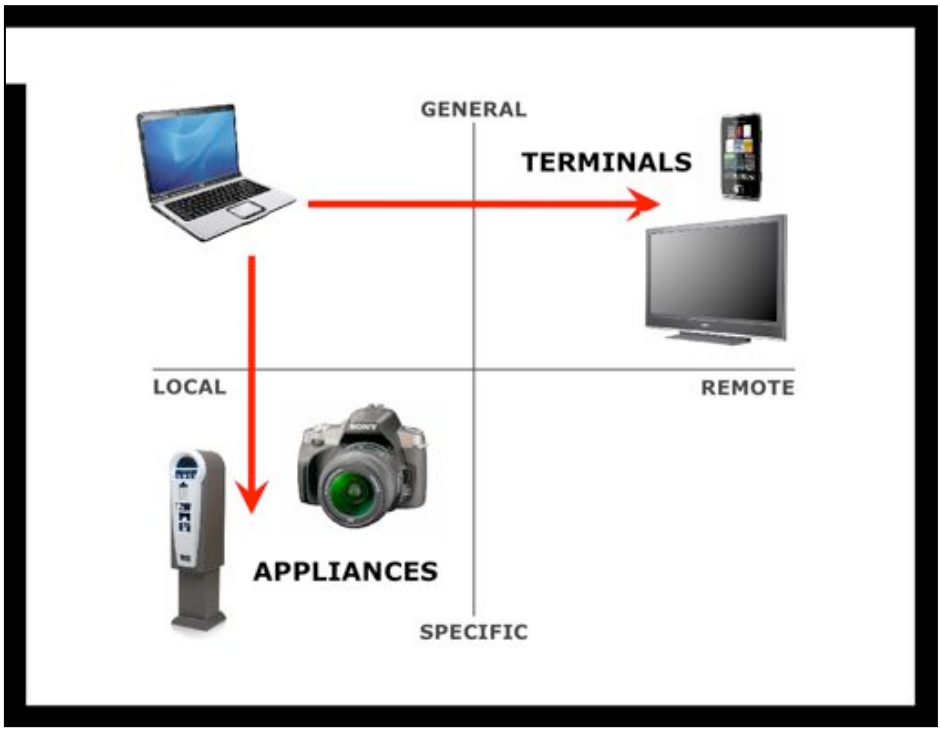
The first is a shift from generic devices and software to specialized devices and software. When computing was expensive, you had one or two general purpose devices that had deal with almost every situation. This necessitated design compromises that resulted in devices and software that could do almost everything, but did none of it well. It was then up to the user to take these generic tools and making them appropriate to the current situation.

Now that processing is so cheap, you can have a combination of 10, 20, or 30 computing devices and apps for the price of that one device, and you can acquire new functionality as needed. This means that every device and software package can have a narrower purpose.

However, something else is happening. Compute power, low cost and small size means that virtually any device can now do what every other device does. We're seeing a proliferation and a homogenization of certain classes of devices. This is why we're seeing all of this churn in form factors. Three years ago it was smart phones, two years ago it was all netbooks, now it's tablets and connected TVs. They're all essentially the same device in different form factors.

The primary value of these devices is that they provide access to services in the cloud. Their utility lies primarily outside of what the devices themselves do.

This is reinforced by the lasting legacy of the Web, which has created a robust interlocking infrastructure of network and compute services that I'm sure we're all very familiar with. More importantly it also created a shift in people's expectations. Today, most people understand that the experience you see on one device is often a part of something that's distributed throughout the world. There's no longer a need to pack everything into a single piece of software, and there's no expectation that everything will be there.

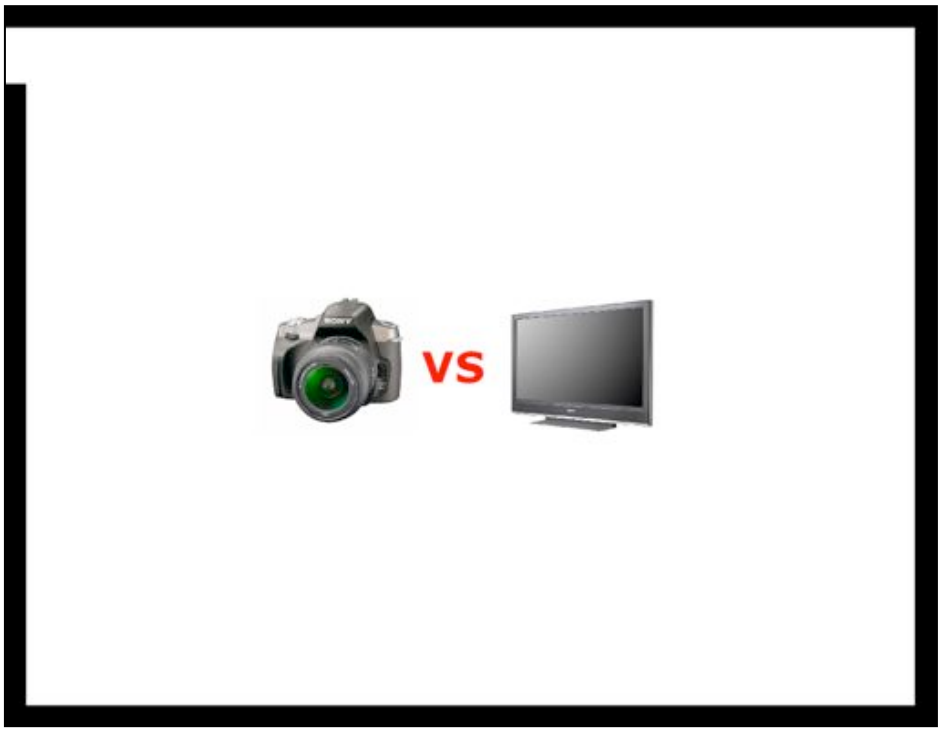


If we chart these tends, two broad classes of digital products emerge.

If we follow the general to specific axis, we see a shift is to more narrow-function devices that are designed to do a small, specific set of things really well. They primarily differ in what those specific things are. I call these devices appliances.

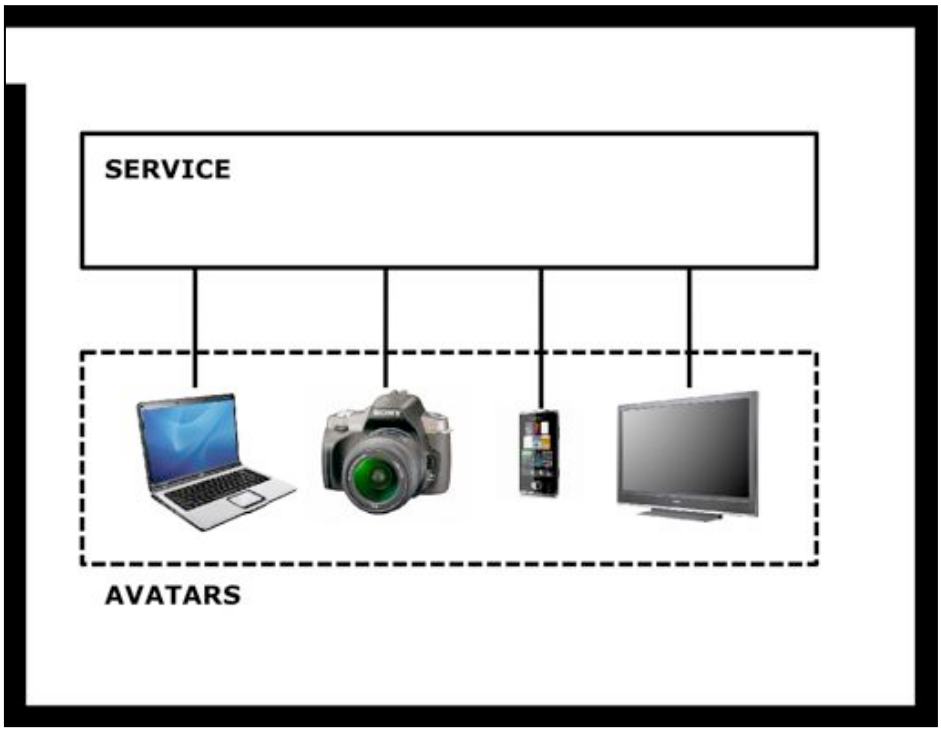
If we follow the local to remote axis, we find general-purpose devices that do roughly the same set of things, and differ primarily in size. They exist to provide access to online services, in a form factor that's appropriate to the context in which they're used.

I call these devices terminals.



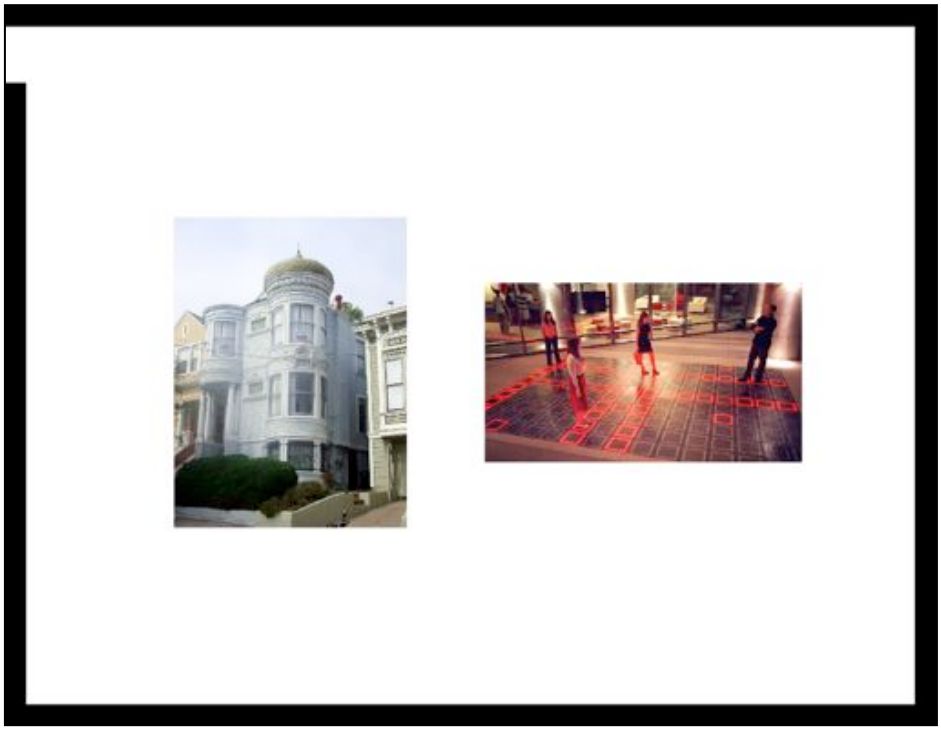
This leads to the first significant design challenge that all this technology brings. It's a tectonic shift in the definition we give to digital objects. I'm sure that at some point in pre-history there was little differentiation between tools. This is a rock that you scrape with, and that's a rock you pound with. But since then, there's been a lot of necessary differentiation of function. This is a fork, this is a spoon, this is a spork. That sort of thing. When we work with digital materials, we create devices that, at some pretty deep level, have interchangeable functionality. There's no reason that a digital camera can't play streaming video or a TV take digital pictures. Under the hood, from the perspective of an operating system, they're basically identical. That is absolutely not the case when you compare a car and a dishwasher, even though they're both made of metal. This erosion leads to some serious confusion and misguided products, such as the current rash of random Android products.

People are misplacing the locus of end-user value in the basic functionality of the system and abdicating doing the hard work of figuring out what a device is for. What this means is that until we've collectively stumbled through this growing phase of confusion, we're going to have a phase where a lot of people don't understand what something is for, or how it's different from something else, or what to call it.



The other big design tectonic shift I see comes from the fact that because these things are now connected, their value moves from the device to the service it represents, and the actual objects become secondary. They become what I call service avatars. A camera becomes a really good appliance for taking photos for Flickr, while a TV becomes a nice place to run a high res Flickr widget, and a phone becomes a convenient way to take your Flickr widget on the road. People see "through" each device to the service it represents, devaluing the device to nearly nothing. This is one of the reasons that traditional premium device manufacturers are having a hard time competing. They haven't realized that there's almost no premium in a device whose only purpose is to access a service. People don't care who makes the hole in space for them, they just want the hole. They want the thing that will give them access to their transmedia story to their current use context, even if that transmedia story is the they're telling about yourself.

This quality will fundamentally alter the shape and functionality of these devices. Some will become so deeply embedded in their service, that they're not even owned anymore, they become product service systems. In the interest of reducing maintenance costs, the design of these objects will start to resemble that of old Ma Bell phones. Others will become completely disposable because there is no inherent value in the delivery mechanism once the message has been delivered, like newsprint. Still others will have clever modular systems so that they can theoretically be future proofed through upgrades.



The upshot of all this is that we're about to see a precambrian explosion of device-types that span uses, scales, and continents as we collectively stumble around and try to figure out what it means when many people have many devices and they're telling many interwoven stories with them simultaneously. We'll yearn for the clarity when all we had to do was figure out where the pixels went or how to make style sheets render correctly on two browsers.

It's going to be very exciting and if it resembles previous such booms, it'll last for about twenty years before the archetypes settle down. During it, we're going to have to figure out the relationship between three interlinked social networks. The one we have as people, the one we have with the devices in our LAN, and the one that those devices have with other devices. We'll take it one step at a time, working through unhelpful interaction metaphors, overly complex data interchange standards, imperfect information brokerage, misbalanced financial models, and just plain bad design. What we'll be left with after that is an array of new tools and new classifications of tools, along with a giant pile of electronic waste.

In other words, to get from here to there, we're going to have to be thinking really hard, and it's going to be chaotic as hell, with as many random successes as there are failures, but at the end of this we will have renegotiated how we define concepts as fundamental as ownership, the value of an experience, the boundaries of objects and how we define what something is made from and what it's for. I think this is a huge change, and I'm very excited to be part of it. That's why I started the new company.


Mike Kuniavsky
@mikekuniavsky
mike@crowdlight.us
SMART THINGS
Ubiquitous Computing User Experience Design
MK
MIKE KUNIAVSKY

Thank you.