Shadows and Manifestations

ubiquitous computing and the Internet of Things

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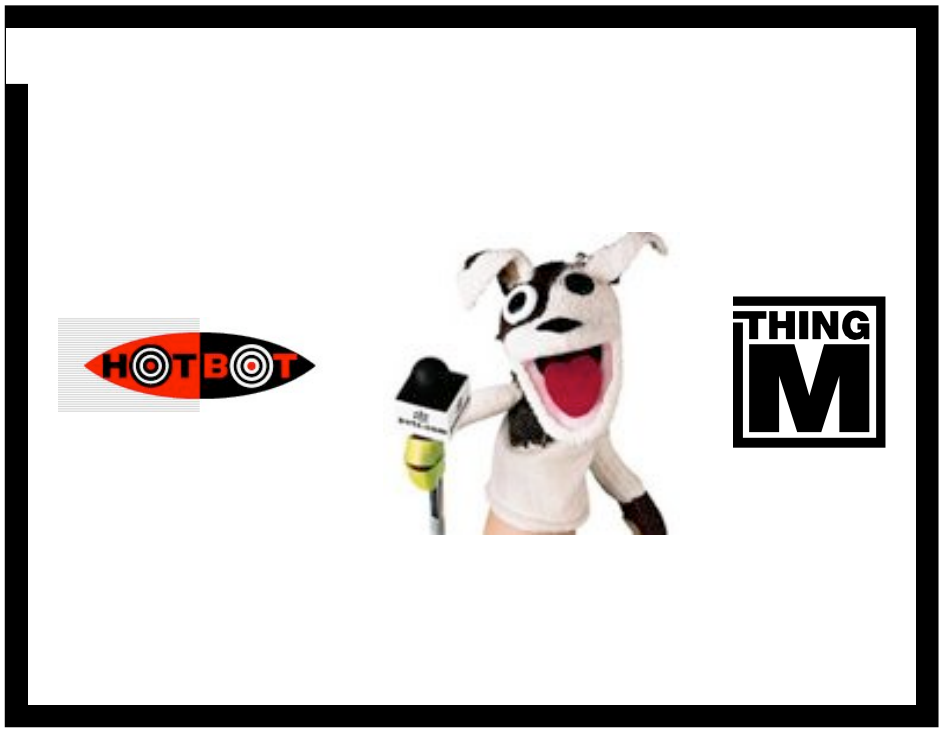
I’m a user experience researcher and designer. I spend much of my time thinking about how technologies and people affect each other from social, economic, historical and technological perspectives, and how the technological side of that relationship can be made better, or at least more interesting, for the human side of it.

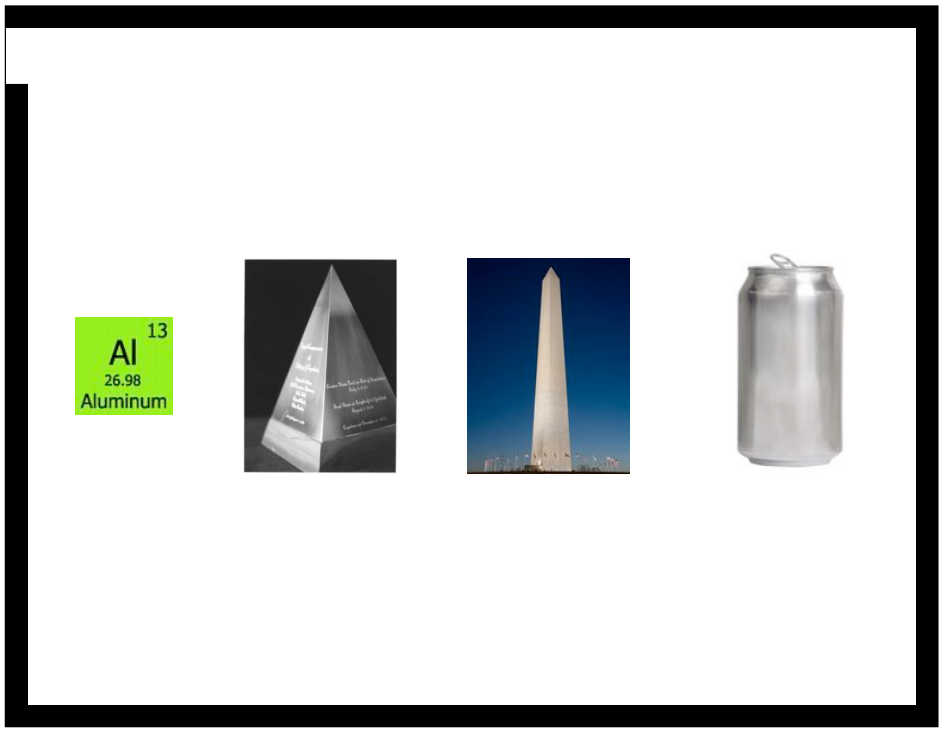
Junkyard photo CC by Sigma. Found on Flickr.



I spent 10 years doing design and research for the web. Some of the products I worked on were pretty famous, some famous, some infamous.

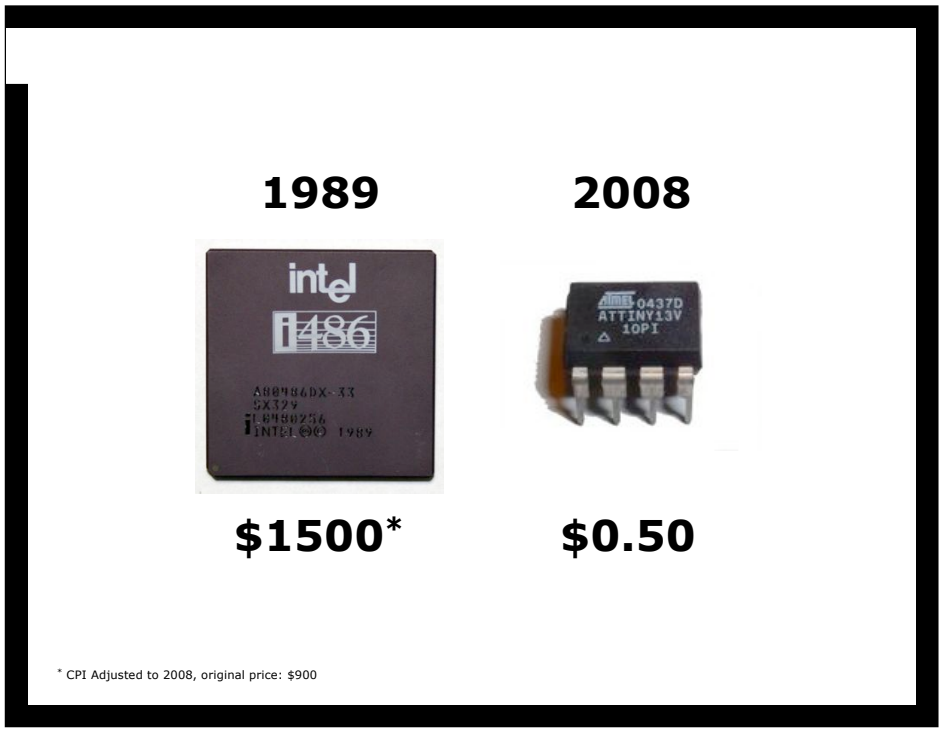
4 years ago I stopped working on the web and 2 years ago I co-founded ThingM with Tod Kurt.

We design and manufacture ubiquitous computing products. In other words, we're trying to be a manufacturer of devices that exist in the ecology of the Internet of Things.



As a technology designer I use the history of other technologies to drive some of my thinking.

Like Joe, I would like to start by tell you a story about alumimum. In 1885 it was the most expensive metal on earth. More expensive than gold or platinum. So expensive that a 3 kilogram block of it, the world's largest, was put on top of the world's tallest structure, the Washington Monument. The same year, a chemist figured out that you could use electricity to extract it from bauxite. By 1886, it was discovered that it was actually the most common metal on earth, and we know what happened.



Something similar has happened with information processing. Oliver showed that great graph, but let me give you a specific example. At the beginning of the Internet era we had the 486 as the state of the art and it cost $1500 in today's dollars. Today, you can buy that same amount of processing power for 50 cents.

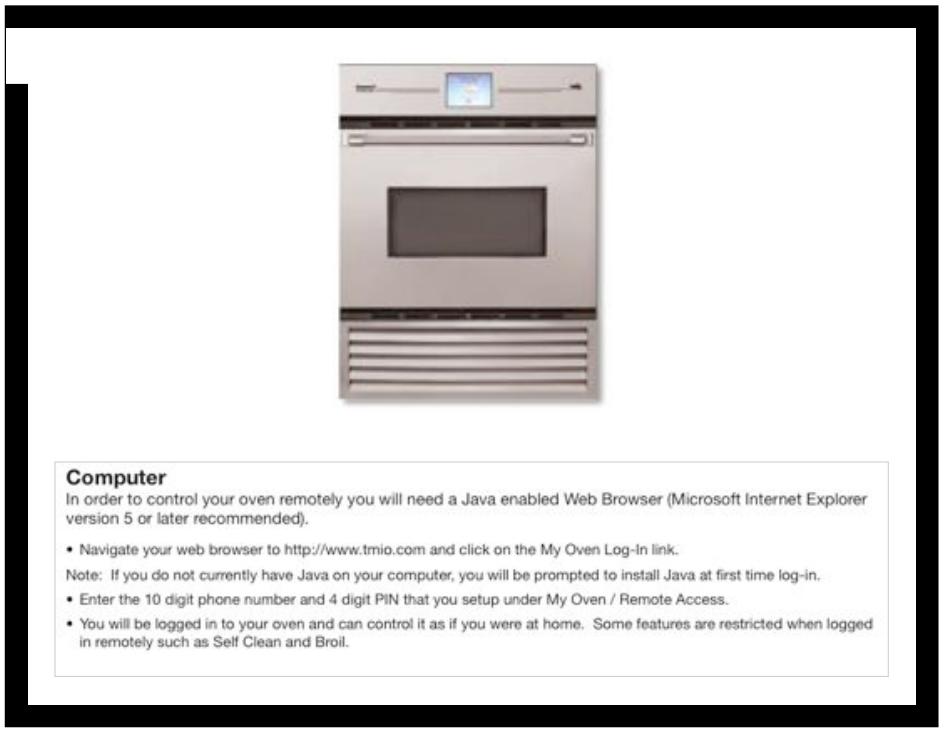
When computation is this cheap, it stops being the focus of design--it's no longer the precious jewel on the monumental structure. It's just one of the blocks that goes into the construction of an object.

In other words, computation, information processing, has become a material to design with.

Once including a CPU has become a line item in the calculation about what to make it out of, the question is how we use this new material. What are its properties? What are its constraints?

Aluminum provides lightness, rubber is an insulator and springy. Information processing brings behavior.

Source: Flickr, Kate_A



Let me give an example. Say I'm an oven designer. Should I put in a mechanical timer or digital timer in this oven? The question becomes not one of "is this hypothetically possible?" but "Will this feature bring me enough new customers to offset the small marginal cost of the hardware?"

Lets look at what these folks decided.

[overlay]

They put in a networked digital timer. You can adjust your oven from anywhere on the Internet.

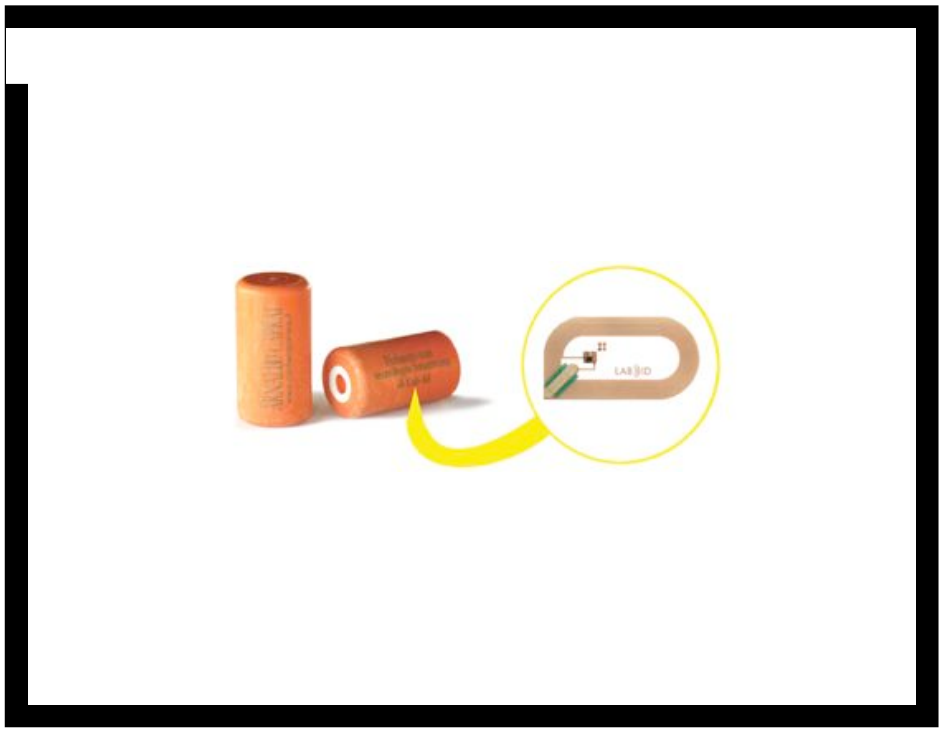
I see this as an example of designers exploring the capabilities of a material. We may be familiar with general purpose computers, but information processing as a material is still unfamiliar, like nylon was in 1940. Now that the the economic threshhold has been crossed to make it a commodity, the design challenge is to use this material to make things better, easier, more profitable, or more fun.

Identification is another piece of the Internet of Things puzzle. Manufactured things have long had identifying marks, from silversmiths' hallmarks to barcodes.

These are the link between the object and information about the object and every object that has one exists simultaneously in the physical world and in the world of data.

Photo CC from http://www.flickr.com/photos/dumbledad/298650884/

I call this data the object's information shadow. Until recently, accessing the information shadow was very difficult. The world of objects and the world of information shadows were separated by the difficulty of access. In a store, you don't know what the barcode means, the store does, because only the store had the database and the hardware. And even they only know a small part of what's going on because a barcode only identifies the class of objects, not the individual object.



The combination of new digital identification technologies such 2D barcodes or RFIDs with ubiquitous computing and wireless networking changes all that..

SmartCorq

This combination of elements let you see the information shadow of the SPECIFIC object you're looking at.

Each object is unified with its information shadow and you can query it. You can now know about where it is made, is it a real Gucci, what it is made of, what your friends think of it, how much it sells for on Ebay, how to cook it, how to fix it, how to recycle it, whether it will go with your mother's drapes, whatever. Any information that's available about an object can now be available immediately. This is the promise of Bruce's spime idea.

Like Joe showed, this is the beginning of mashups between the physical world and the data world, because the communication can go in both directions: your shoes already tell your iPod how far you've run, but now your iPod can tell your fridge how many calories you've burned and your fridge can tell you what you should eat.

The point is that the complexity of the interactions we can have with the objects in our life has just jumped about two orders of magnitude.

And it's in this space of smart, self-disclosing objects that I've been researching and designing in for the last 4 years.

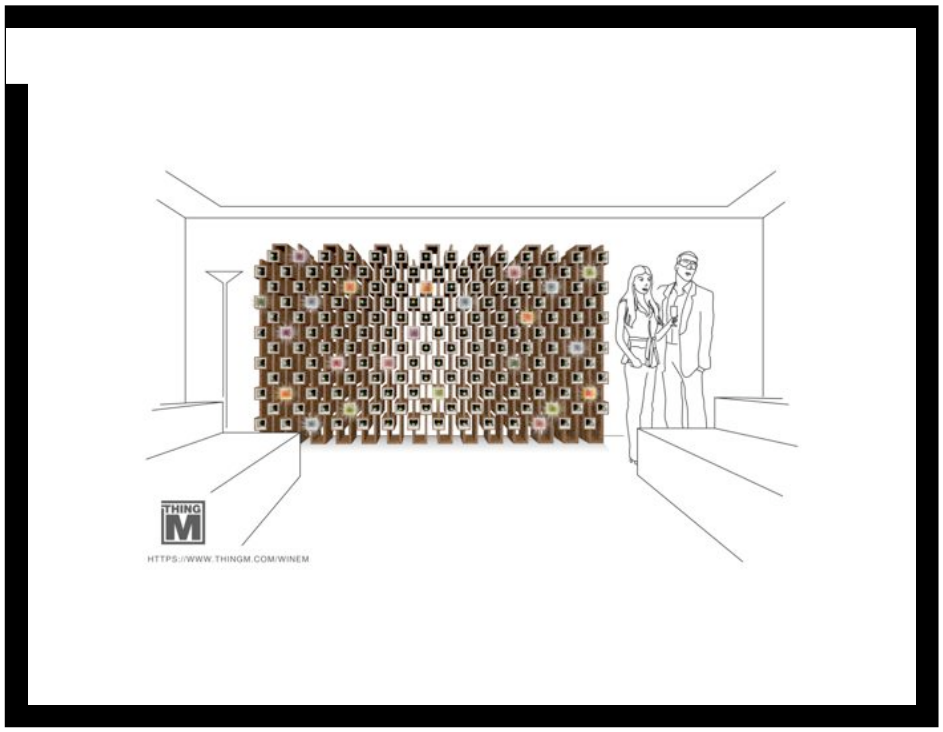
Source: Yottamark

Let me tell you about two projects that my company has done in the last year. One of my personal philosophies is that to understand the implication of ideas, you have to put them into practice, and you can see both of these as examples of that.

This one focuses on information processing as a material. It's called BlinkM and it's a smart LED. It's kind of an atomic unit of ubiquitous computing. It has a CPU, it speaks a networking protocol, and it has exactly one bit of output. It's a direct replacement for a standard LED, except it can be any color and blink in any pattern. It sells for about $12.

To answer the question of the question that's the name of this workshop, this IS a toy for hackers, but it's also our entry into meaningful light. We aim to make the light in our environments tell us things about ourselves and our world. So what's an example? Well, imagine an office cubicle door that's connected to your calendar and that changes color based on your activity.

We've sold about 3000 of these since we started selling them in March. We have a high power version coming out in the next couple of weeks that can run either ultrabright LEDs that are 50 times brighter than a regular LED or you can run a string of 50 LEDs and it runs off of 12 volts, so you can use it to your car brake lights.



Let me show you another product we've developed. It's called WineM and it's a smart wine rack. It's designed to unify the information shadow of wine with the bottles themselves.

Wine has a very rich information shadow. There's a huge amount of structured information about where it was made, what it's made of, how it was made, what critics think about it, etc. In addition, every bottle is a social object, like what Jyri talked about. There's a community of collectors, aficionados, etc.

Our goal was to create a service that would unify the information shadow with the object without interrupting the experience of drinking wine, embedding the technology into the experience.

This is our RFID bottle tag. It connects the physical bottle with a database of information about the bottle.

We then project the information about every bottle on the bottle itself.

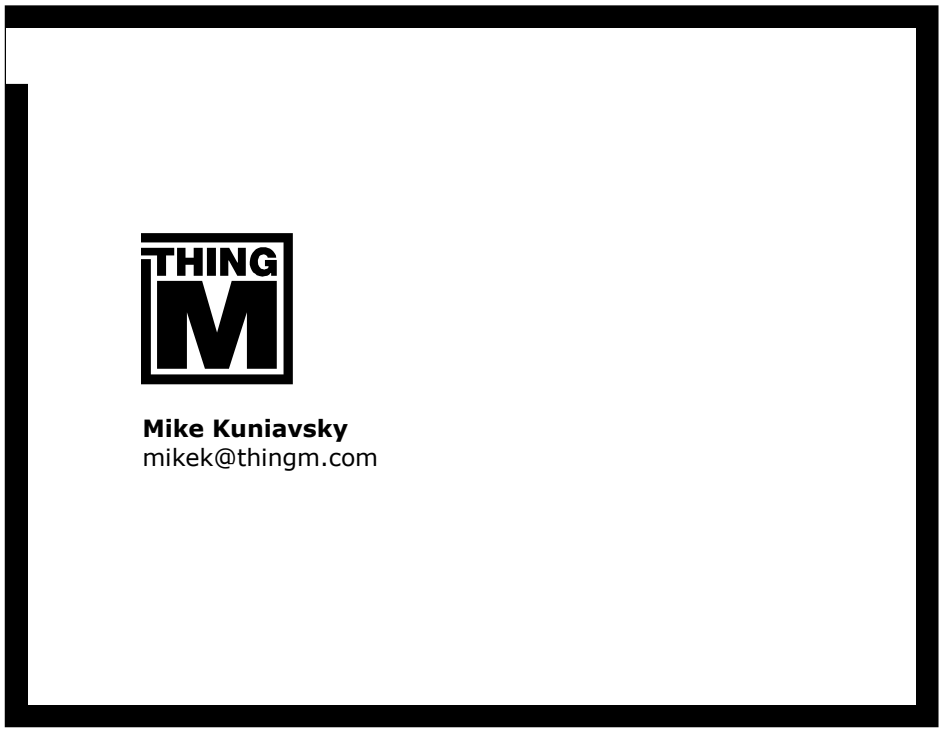
[Go to video]

For example, you can say: show me all the French wine in different colors by region. Now show me the Bordeaux wines. Now show me the ones whose current market value, as determined by an onoine auction service like WineBid, is between 50 and 100 dollars. Since it's on the net, you can subscribe to an RSS feed from the winery and it'll light up when there's news, or an exclusive sale. In other words, now every bottle can get mail. You can compare your wine collection with your friends', You can get an update on the kind of wine you've been drinking for the last six months. You can get a text message when the last bottle of a case is removed, etc. Basically, you can start mashing up the physical and the data spaces in completely new ways that are still mostly part of the experience.

[Let me show you it in action]

We see the implication of all of these technologies in a similar way to the others here. We imagine everyday objects becoming subscriptions, becoming avatars of services and fundamentally changing our relationship with ownership, with meaning and, pretty much with everything.

Photo CC by bs70, found on Flickr



Thanks!