

The dotted-line world

shadows, services, subscriptions

Mike Kuniavsky

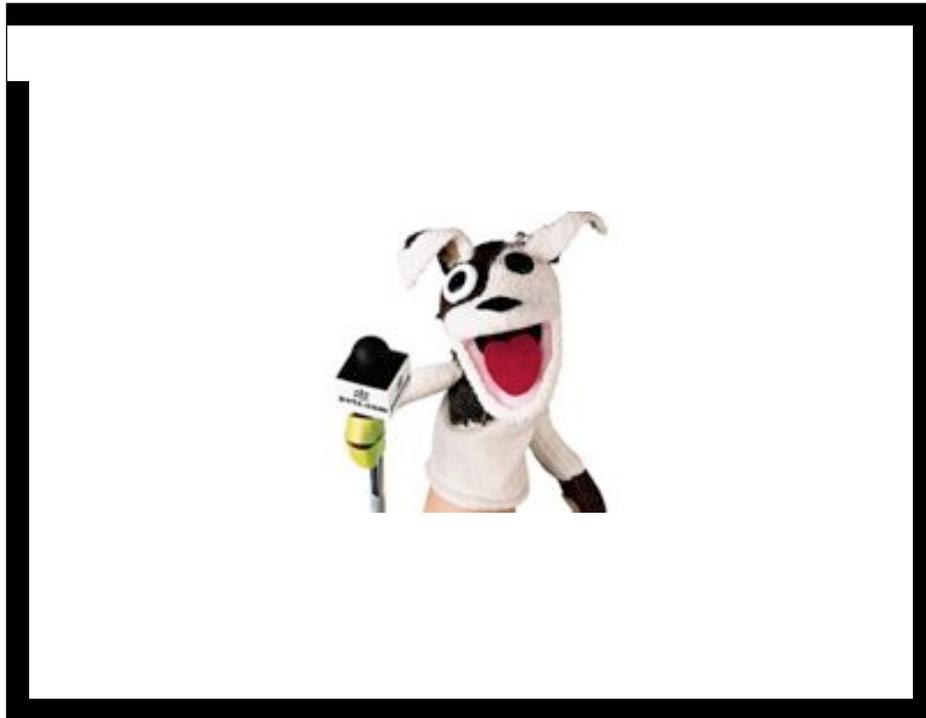
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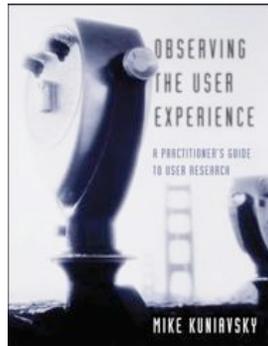


I'm a user experience researcher and designer. I spend much of my time thinking about how technologies and people affect each other from social, economic, historical and technological perspectives, and how the technological side of that relationship can be made better, or at least more interesting, for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

Junkyard photo CC by Cocoarmani. Found on Flickr.



I spent a little more than 10 years doing design and research for the web. I worked with many dotcoms, some famous, some infamous.



I sat out the first dotcom crash writing a book based on the work I had been doing. It's a cookbook of user research methods.



In 2001 I co-founded a design and consulting company called Adaptive Path. Things went very well, Adaptive Path is doing very well, but I was interested in other ways that technology was changing society.



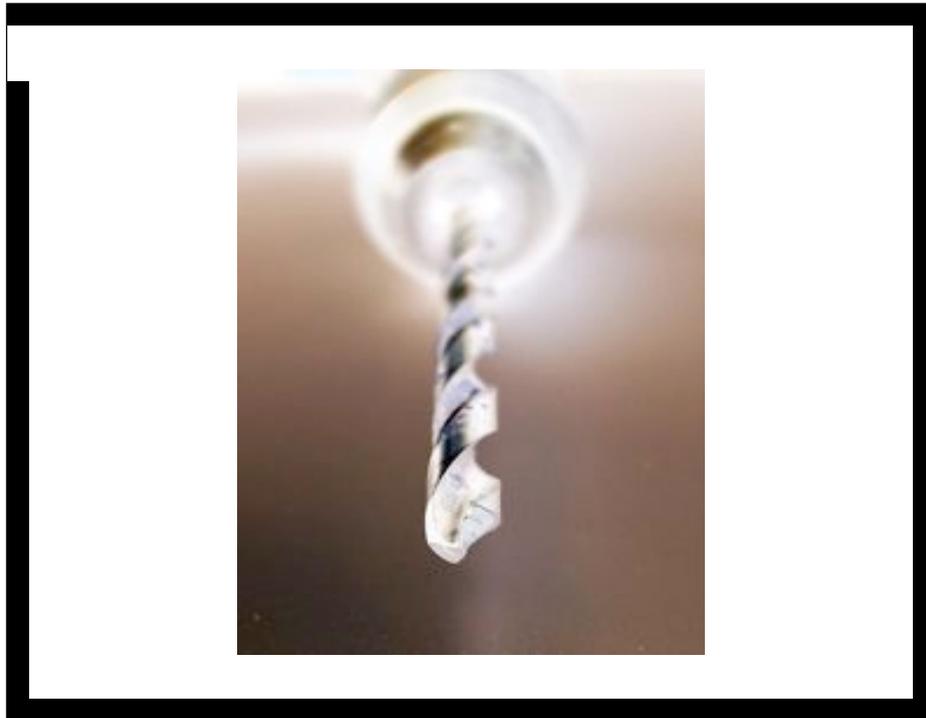
So I founded a company with Tod E. Kurt called ThingM to pursue these ideas commercially three years ago. We're a ubiquitous computing consumer electronics company, which sounds fancy, but we're pretty small. We design, manufacture and sell ubicomp hardware. I think they may have some of our stuff in the Maker Shed.



Today I want to talk about an opportunity for the design of a potential new class of everyday products, one that ties together physical devices and online services.

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Let's start with a fundamental question: why do we use tools? We use tools to solve problems. Sometimes we get pleasure from using tools, and sometimes tools bound problems and give us new insight, but most of the time we use tools because they help us get from point A to point B. Once B is reached, the problem is done and the tool should be put back in the toolbox.

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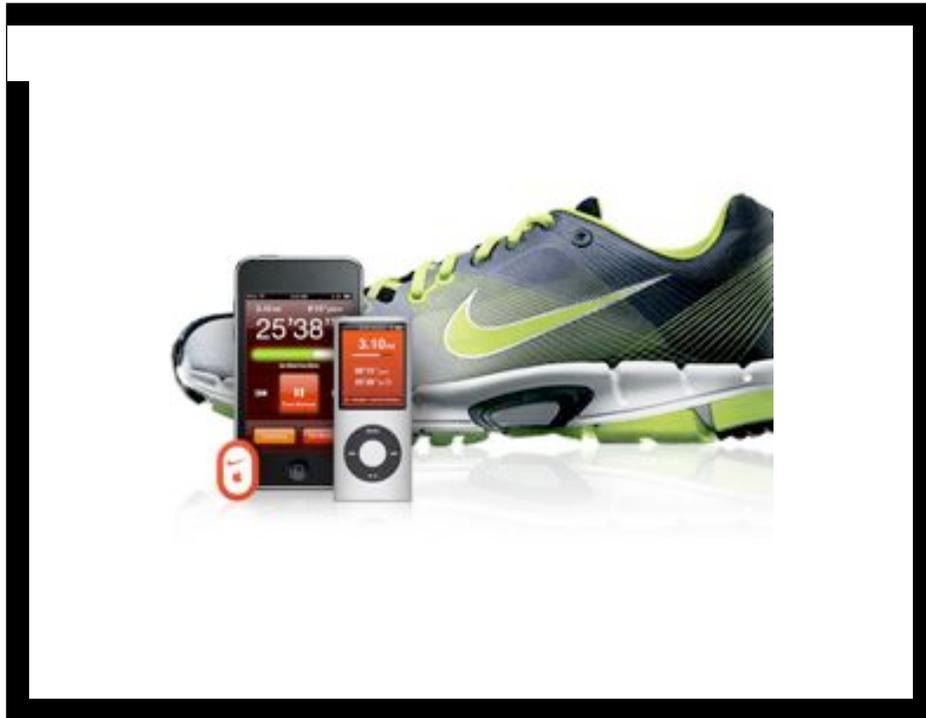
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However, that's not how digital tools are typically designed. In my experience software developers and device designers assume that people will be using a product all day long, every day, which is why it needs every feature you can imagine. That's a nice fiction, but the only product it really applies to is underwear, and not always then, either.



We are starting to see a fundamental change in this attitude in the form of widgetization. Little blobs of functionality, whether they're on your desktop, your phone or your Chumby are starting to appear. Moreover, they are now escaping from the bounds of general-purpose computing devices, whose one dominant feature is that they can do many things passably, but nothing well, and becoming dedicated devices.



MP3 players, personal video recorders, digital TVs, GPS devices, all kind of budded off of general purpose computers to become things in their own right. Other products, meanwhile, move in the other direction. Everyday things like shoes are augmented by technology, and as they do that, they become widgets on the screens of other computers.



As we develop these tools we're faced with an interesting problem: we have all of this technology, all of these ways for devices to communicate with each other and with the internet, and to process all of this data, but what do we do with it? Now that we CAN connect anything to the Internet and exchange data, why should we?



I think it's because we can use these technologies to create a new class of devices that are more better made, more durable, more ecologically sound and more responsive to market changes and people's desires.

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First, let me back out a bit and talk about a couple of key concepts. The first is item-level identification and tracking.

Manufactured things have long had identifying marks.

Image courtesy of Leopard Antiques, leopardantiques.com



They create a link between the object and information about the object.

This means that every such identified object exists simultaneously in the physical world and in the world of data.

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I call this data the object's information shadow. Until recently, accessing the information shadow was difficult. The world of objects and the world of information shadows were separated by the difficulty of getting at the information. When you're 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 and only has the data that they put into it.



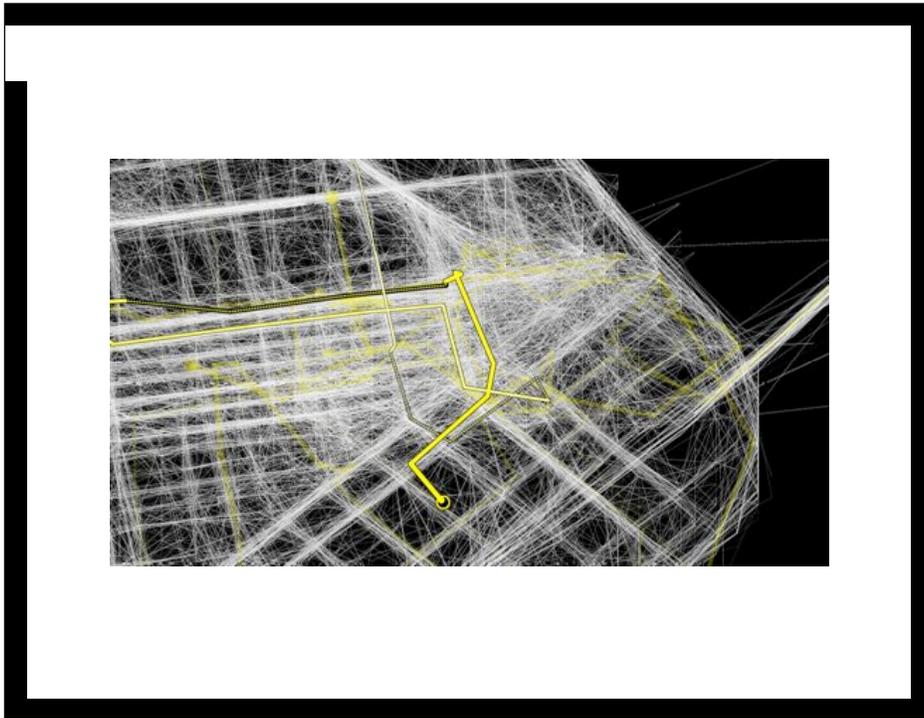
Individual item-level identification takes this to a new level. And wireless networking means that we can now instantaneously see the world of information shadows as we're interacting with the world of objects.

Image source: SmartCorq



You can, hypothetically, look at any object and know where it was made, 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, whatever. Any information that's available about an object can now be available immediately and associated with that object.

Image source: Yottamark



Connect it with location information and you have Location Based Services for anything. This is Cabspotting by Stamen.

As Tom Coates says, once we have a handle, you can throw the data around.

Source: stamen.com



Great, but before we know how to do something with this, let's go back to the "Why do we use tools?" question.

Ultimately, we use many of the tools in our lives not because we want to use them, but because we want the result. As the saying goes, "People don't want to buy a quarter-inch drill. They want a quarter-inch hole." (Theodore Levitt)

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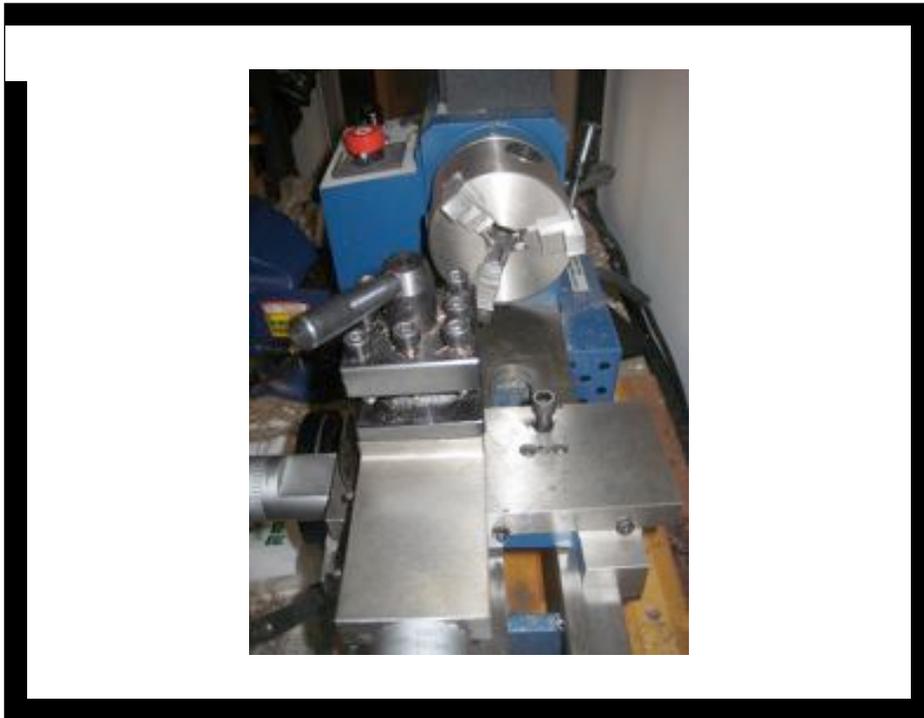


And thus we enter the realm of services.

Now there are two ways people typically talk about services.

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Technologists talk about services as atomic unit of *functionality*. A service is like a superset of a well-constructed object in object-oriented programming, it's a collection of capabilities.

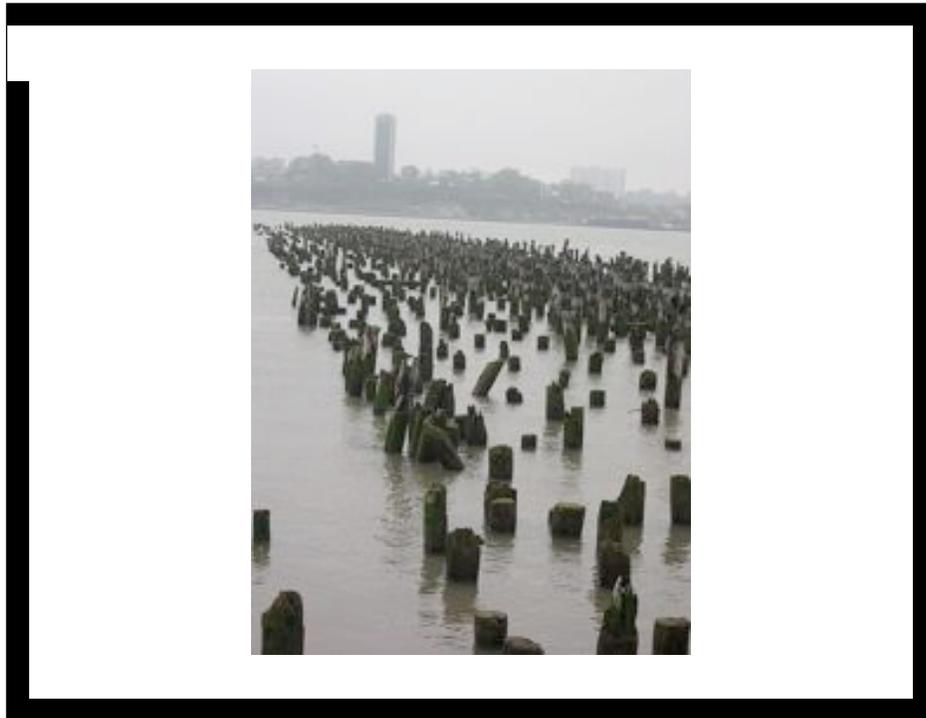
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But that's not how end-consumers think about it. From the user experience design perspective a service is an atomic unit of *activity* offered by someone or something to perform a task for us that we don't want to do, or can't do. As Dan Saffer says, it's "A chain of activities that form a process and have value for the end user."

Photo by John Althouse Cohen

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Thus, a single service from an end-user perspective may consist of a number of technological services that may be linked under the surface, but appear as distinct entities.



They are representations, physical manifestations, projections into physical space of services, but are not services themselves.

I call them avatars.

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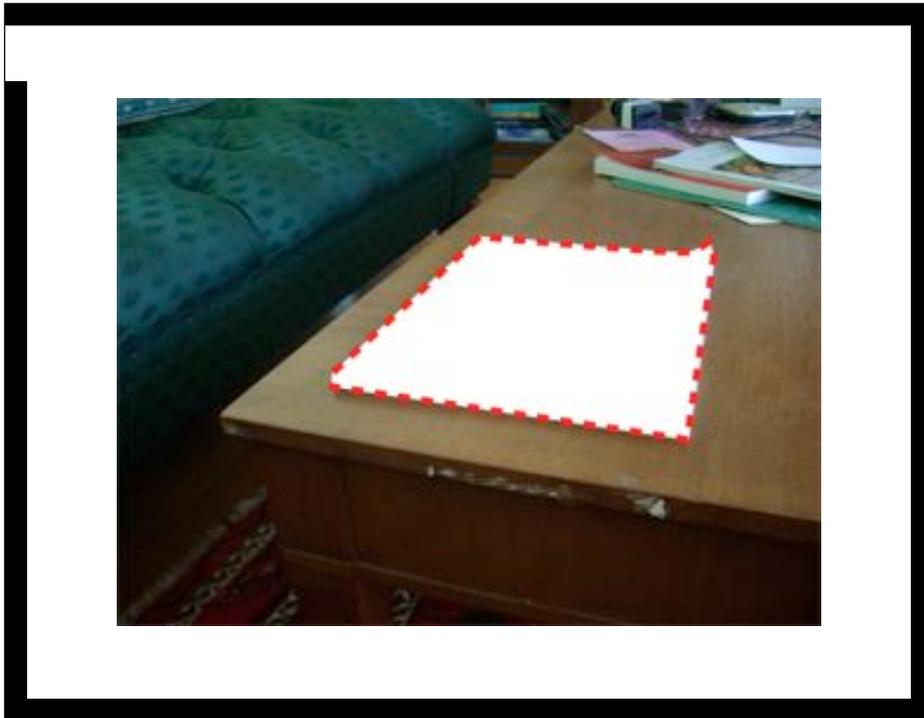


Here are two avatars of iTunes. A number of familiar appliances--cell phones, bank machines--are pure avatars of a service. They are tools that are literally worthless without the networks they're attached to. The object dematerializes into the service. This is a relatively new phenomenon, and it's spreading.

Courtesy of Apple Computer.



What's a subscription? Well, it's an agreement between a publisher and subscriber that one will provide a service of a certain type to the other. In the case of the New England Journal of Medicine, it's medical information, with one of the avatars being a softcover book that's delivered every week.

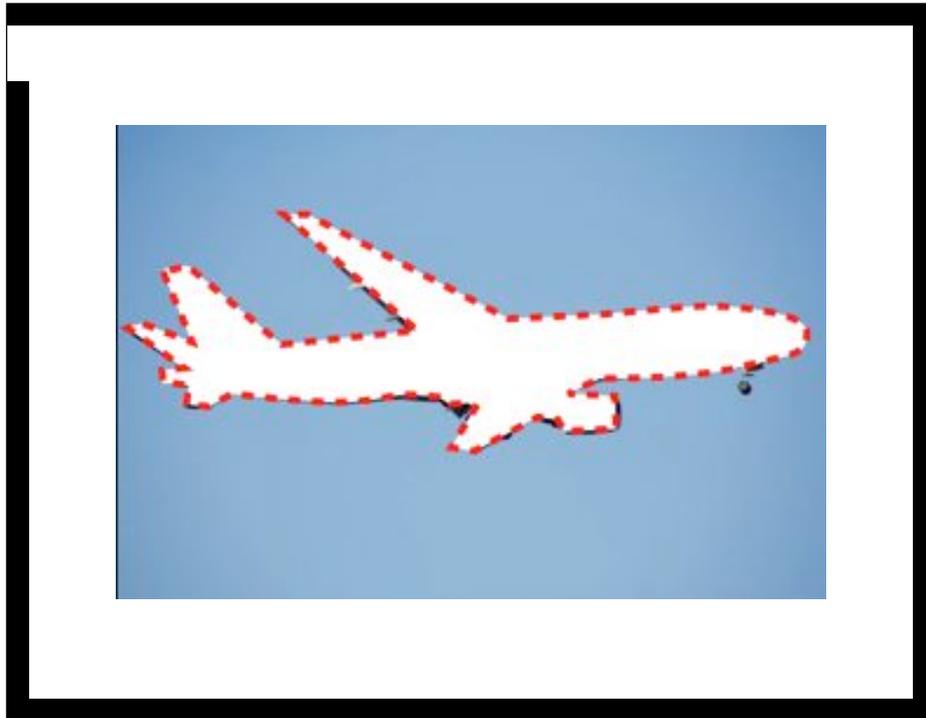


In actuality, the book is just an avatar. As a subscriber, what you own is the right to the information contained within that book, which can be delivered in a number of ways.



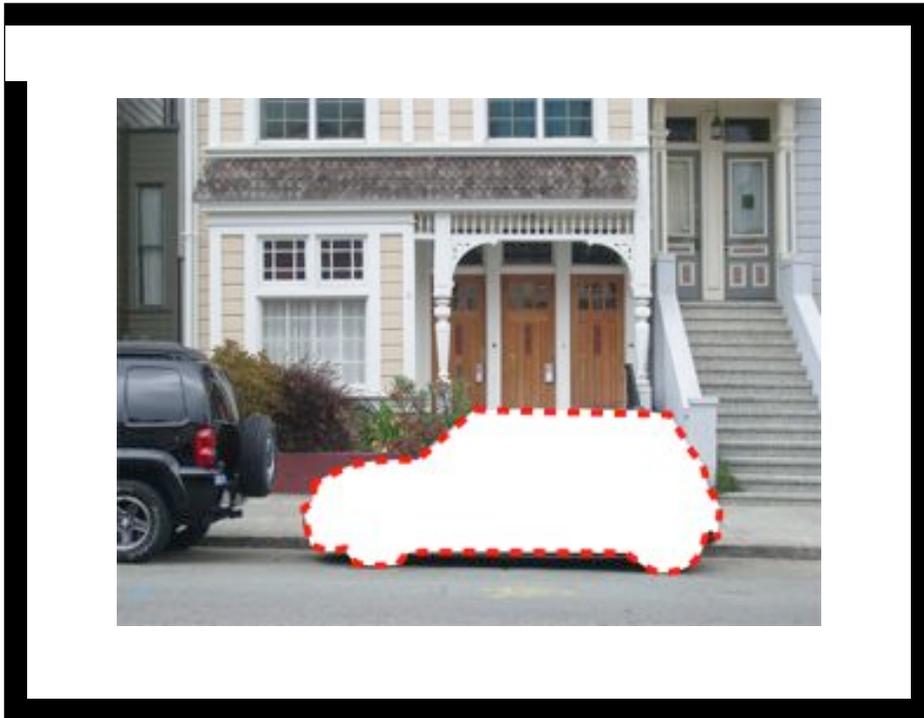
A subscription represents a slice through a larger information space, where the specific contents of each slice are different, I can take out the slices I need from it, assuming they've already been created. I can take them out in paper form, on a website, or on a mobile device. The specific avatar is not the service, it's a representative of the service.

Information is not the only thing that acts this way.



Most airlines, for example, don't own their own planes and haven't since 1965. They lease them from General Electric, sometimes complete with flight crew and ground crew. GE actually owns them and, as I understand it, in turn leases the engines from another division of itself. When an airline needs more capacity, it leases some more. What an airline owns is a promise from GE that it will provide the service of flight to the airline for a specific period. GE's engine division, in turn provides the plane division with the service of thrust.

Let me bring this down to earth. Large-scale sharing of resources like this is not a new concept. Real estate has been leased for aeons and transportation and factory equipment for centuries. However, new technologies are making this affordable and profitable at ever smaller scales.



When you buy into a car sharing service such as City Carshare or Zip car you subscribe to a service.

Each car is connected to a central network. You can only open the car and start the engine when your specific keyfob RFID is scheduled to open and start it. It uses a GPS to track where the car is, whether it's been dropped off at the right location, and how far it's been driven. All of that is transparent to you, the subscriber. The relationship you have with these cars is very different than rentals. Your experience of the service is much like your own car because you have access to it 24 hours a day, 7 days a week, with very little advance notice.

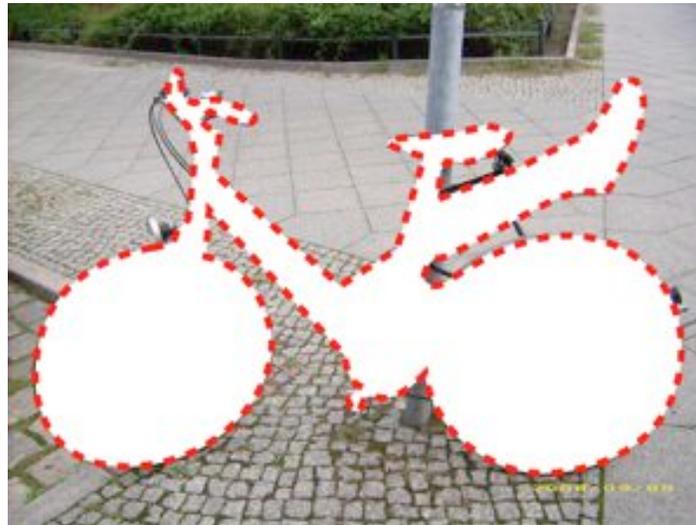


However, unlike an owned car, it's a car possibility space. This is an ad from Zipcar that shows the implicit power of this kind of system, from the consumer perspective. From the social perspective, it means that resources are used more efficiently: the economies of scale for buying and repairing a fleet of vehicles is significantly lower than individual ownership. From the corporate perspective, it represents an ongoing source of revenue.



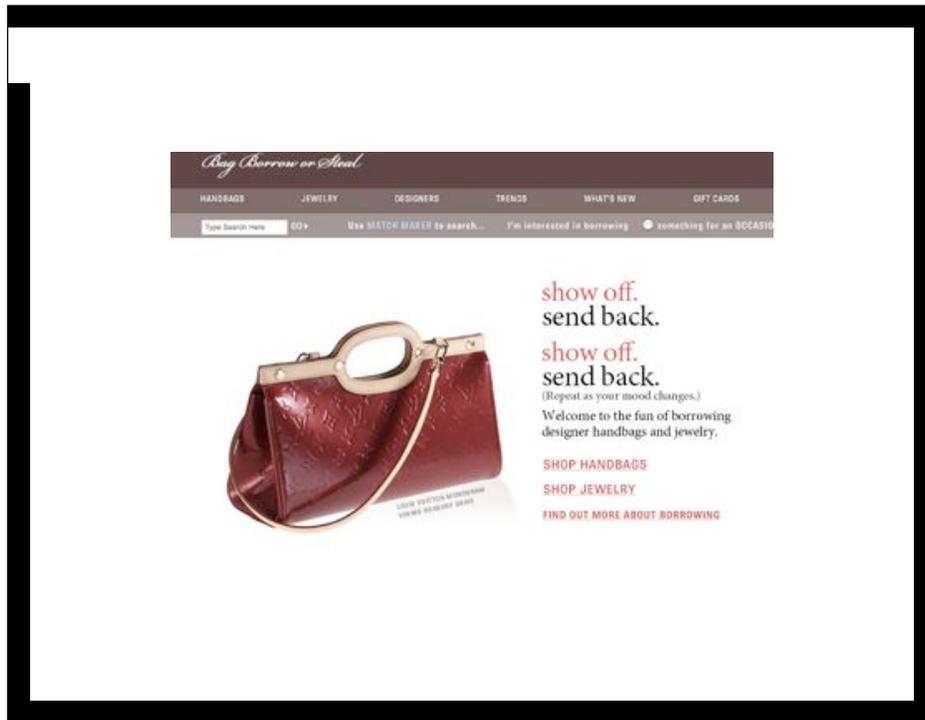
It also starts to raise questions about ownership. To paraphrase Bruce Sterling, why should I own a bicycle and my neighbor own a bicycle, when we typically don't need to use one at the same time? Why does everyone on the block need to own their own wheelbarrow?

Photo CC by alykat, found on Flickr.



In fact, bicycles are the next step. This is the German Call-a-Bike program, run by the rail service. You need a bike, you find one of these bikes, which are usually at major street corners. You use your mobile phone to call the number on the bike. It gives you a code that you punch in to unlock the bike lock. You ride the bike around and when you've arrived, you lock it. The amount of time you rode it automatically gets billed to your phone, by the minute. The program would not be possible without item-level identification and wireless networking technology and is much more successful than all of the free bike programs because it has built in financial incentives for everyone involved, and yet provides significant social goods.

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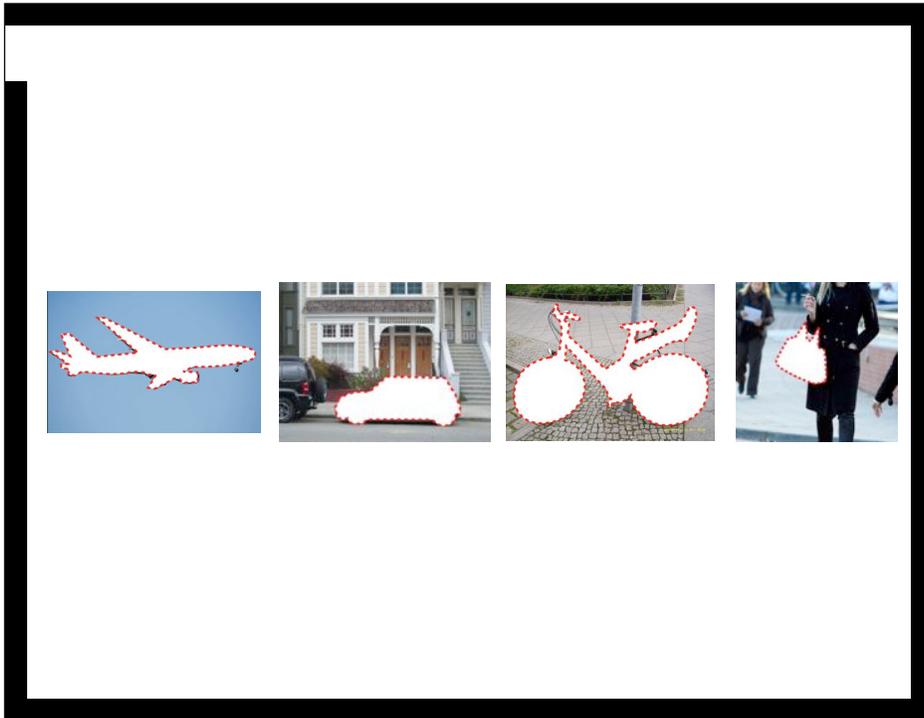


Here's another example that points to some exciting possibilities. Bag, Borrow or Steal is a designer purse subscription site. It works like Netflix, but for really expensive handbags.



It's fashion by subscription and it again points to a new way of thinking about everyday objects. It changes the meaning of ownership and it changes the incentives in the design of everyday objects in a profound way.

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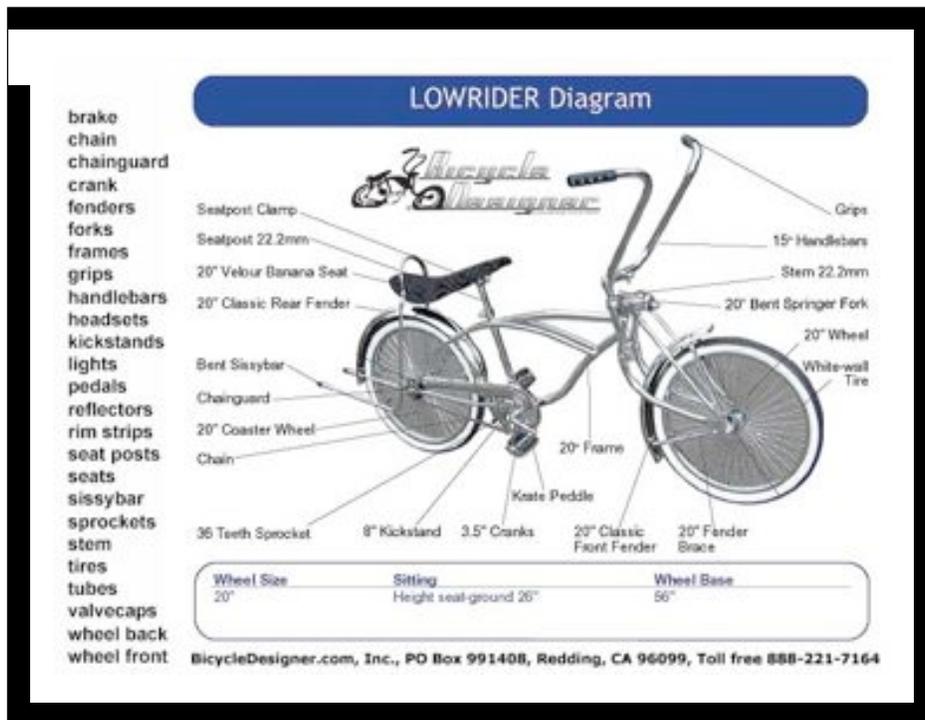


Notice a trend? It's getting cheaper all the time, roughly tracking the price of tracking individual objects and communicating their status.



If this trend continues, and I believe it will, it means a profound shift in our relationship to everyday objects in terms of how things are designed, how they are manufactured and how they're owned.

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The design of these avatars is quite challenging. They can't really be as personalized. You just can't pimp your City Carshare car. You only get one kind of bike in the call a bike program. That's an important problem to solve. We love to have our stuff be ours. However, the same technologies can bring that, too. Our key fob can bring our whole world with us, and whether sit down in a minivan, on a chair or in a plane we can bring our world with us. The thing can become our preferred colors, with our favorite music, and a picture of our loved ones on the dahboard, desk, or wall. Is it the same thing as owning it and leaving your stuff in it? No, but it's closer.



The replacement cycle is longer, because there is less market incentive. If you're already on the hook for a subscription, the company's incentive to innovate is much lower, other than to reduce their maintenance costs. This is why old phones, which are early service avatars, are such tanks and changed so slowly. The way I believe that this will be overcome is through open standards and competing services. If you have ten services vying for your service contract, they're more likely to innovate.

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The design of the services will be very tricky, too. Two of the main downfalls of services I've looked at are that:

1. They assume they can control the whole experience. This is the Modernist model. It assumes that if we think hard enough about all the pieces, we'll be able to control the whole experience. It's a guaranteed failure. It failed for Henry Ford, it failed for the Soviet Union, it failed for IBM. Central planning doesn't work in the long run

2. They assume people are rational and that functionality and price are the key drivers to technological adoption. "Any color as long as it's black."

We must think of service design as going beyond functionality and beyond monolithic lock-in, but as a process of addressing specific needs. First, let's get the lightbulb right, make it something people love, then move on to the toaster.

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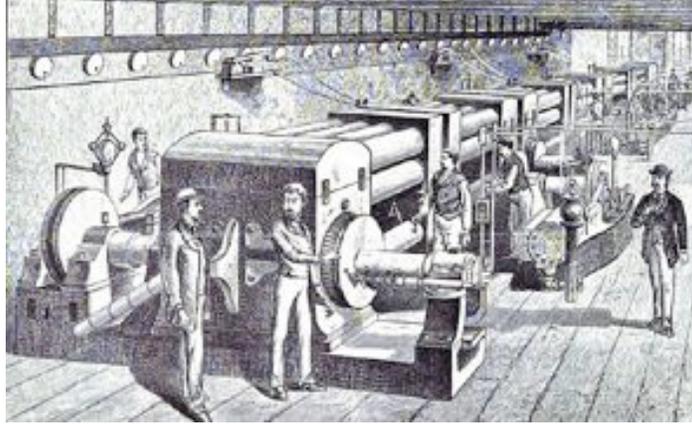


However, I think that the potential here is immense. More durable because they have to be repaired, rather than replaced.

The devices themselves can be more flexible, and repairable because the components can be interchangeable.

We can upgrade functionality through software, or through replaceable hardware.

Ironically, one pioneer in this is Vertu, the ultra-luxury phone company. Because their phones are made of exotic materials like solid gold, the guts have to be upgradable, which the company will supposedly do free of charge and dispose of the old hardware appropriately. This may actually make the Vertu the world's most ecologically and socially responsible phone, assuming any of their customers ever takes them up on the offer.



To create these new experiences we need to think about the design of both digital devices and infrastructures differently. We need step back from standalone tools and think about what service those tools deliver, then construct new avatars that fit better into people's everyday experiences. We also need to step back from our infrastructural products and think about what services they enable. The electrical grid did not first start out as an abstract electrical grid in South Manhattan; it started as a way to deliver electric light. The electric bulb was not a standalone device, it was an avatar of Edison's light delivery service and it was, first and foremost, designed to solve a specific problem for a large consumer market. Only then did the infrastructure it created expand to solve other kinds of problems.



I started by saying that this represents a potential new class of products. Why potential? Because for a technological solution to become successful—in the sense that it is widespread, widely used, and provides a net benefit to its end users—it need to have a good cultural fit.

There's great opportunity here to create an ecology of services embodied as robust, valuable, exciting new tools with focused, limited functionality, tied together with item-level identification and wireless networks. Whole classes of things that can enrich our lives and bank accounts are now possible thanks to the way ubiquitous computing interweaves services and devices at an intimate, everyday level.

We are working on these things at ThingM, we've developed a wine information shadow service with several avatars, and we believe that the potential is immense. People do not not use computers because they love to compute, they use them because they're the best tool that lets them get on with their lives. Abstract infrastructures are important, but they're a tiny piece of what makes technology important and powerful. We now have the technology to create whole new classes of tools for living in a way that is more useful and fun for individuals, more sustainable for society, and more profitable for companies. That way is to recognize the connectedness of all everyday things, and to build on it, rather than ignoring it.



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Thanks!