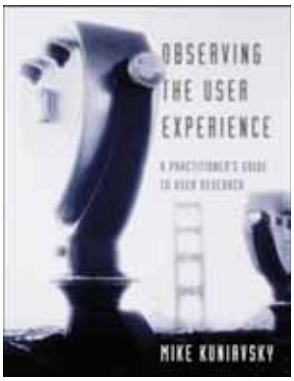
The Coming Age of Magic

Mike Kuniavsky



adaptive path

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Let me start by telling you a bit about who I am.

I am a consultant specializing in user experience design and user research.

I wrote a book on user research techniques, co-founded a user experience research and design company called Adaptive Path, and recently cofounded a new design and technology company, ThingM.

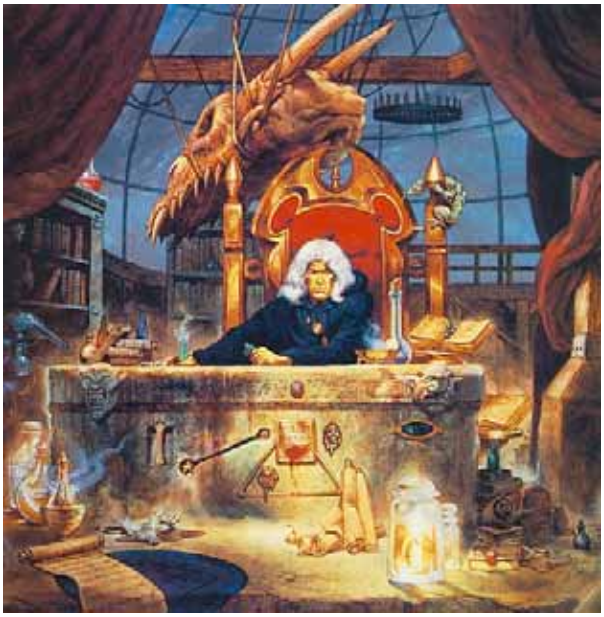
I am interested in the expressive physical aspects of technology. Here are some projects I've done. This (Stock Puppets) is a robotics project I did with Jim Mason some years ago, this (Three Dreams) is part of an installation I did with Elizabeth Goodman, this (Bass Ghost) is a generative subsonic bass project, this is a Roomba hacking project with Tod Kurt, this (C4F3) is a cafe of augmented objects I curated for the 2006 International Symposium on Electronic Art/ZeroOne Festival.

Today I want to talk about magic.

No, not that kind of magic.

Image by Clyde Caldwell. From
http://www.fortunecity.com/rivendell/chronos/445/add19.jpg

No, not really this kind of magic, either.



I want to talk about magic as a metaphor for the design of ubiquitous computing devices.

But before I get into that, let me start with the previous dominant metaphor, the desktop metaphor.

Painting by Jeff Easley. Found on http://www.fortunecity.com/rivendell/sakura/489/lan12.jpg

Here's a short history. In the 80s and early 90s, we went from this (green screen), with an insight about this (desk), to this (Star) then this (Lisa) and then finally this (laptop with screens).

I'm sure you're all familiar with that.

Now, in the mid-90s something interesting happened. And I'm not talking about the Web, though that certainly also part of it. I'm talking about low-power CPUs, Lithium Ion batteries, and mature communications standards. These allowed for the creation of a new kinds of computational devices, portable devices. Devices that weren't tied to a desk and didn't necessarily have a keyboard. Apple made Newton, then Palm made the Pilot.

Despite the physical differences, the core interaction design metaphor that nearly all of them were using was at its heart, the desktop.

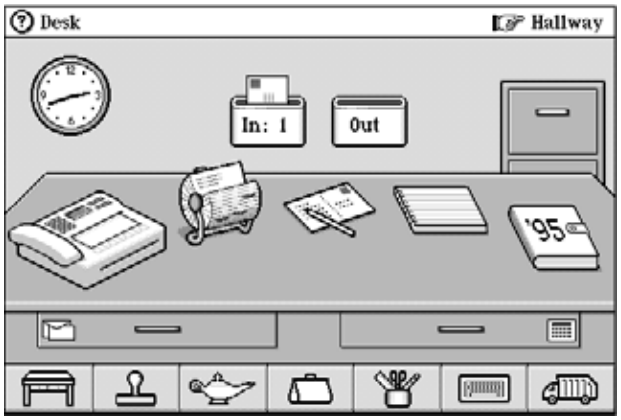
Messy desk from http://www.flickr.com/photos/pinprick/40546557/, Apple Lisa screenshot from http://www.digibarn.com/collections/systems/apple-lisa2xl/apple_lisa_screenshot.gif

I want to talk about a device from roughly the same era as the Newton and Pilot that shows how the desktop metaphor can really lead design astray when applied to portable technological devices.

This is the Sony Magic Link, released in 1995. You probably saw it as a blip on your radar. It's running an operating system developed by a company called, appropriately enough for this talk, General Magic. General Magic was started by a bunch of Apple expats who were trying to take the ideas birthed at Apple to a new level. The operating system is called Magic Cap.

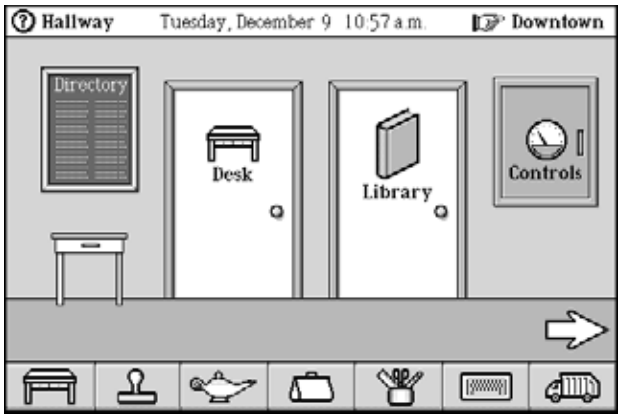
Their core development principle was to couple the idea of a portable computer with network communications. And Magic Cap, at least in concept, is a very interesting operating system. It uses a compiled byte-code language called Telescript that is designed for developing intelligent agents. Unfortunately, the company wasn't particularly successful and very little software was written for it.

From a UI standpoint, Magic Cap is also interesting. General Magic, understanding that these devices were different than desktop computers, tried to create an interaction metaphor that could encompass the power of portable, networked devices. The way they decided to do it was to leverage off of their experience creating the desktop metaphor at Apple and extend the desktop metaphor. Let's see what happened.



This happened. Here's the Magic Cap desktop. Unlike previous desktops it looks like a desk. Why is that, you may ask? Isn't that going backwards?

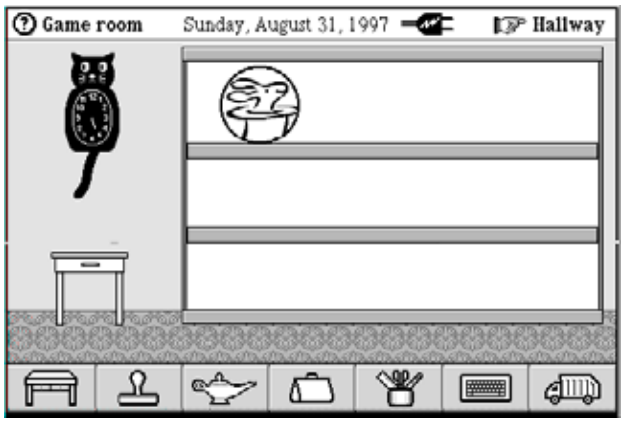
Well they had a reason for it. I don't know them, and I haven't talked to them about this theory, but I believe that they wanted to make it clear that because you were now no longer confined to a desk by the device physically, you should not be confined by the interface. Just like the device could physically leave your desk…



…you could leave the desktop in the OS. See, there's your desk, and here it says it we're in the Hallway.

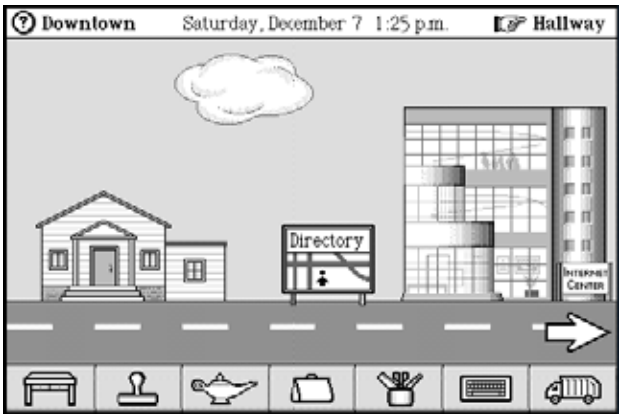
Here is where you can start to see the problem of sticking too close to a metaphor when it's no longer really applicable. We're using an operating system, but now we're in a maze of passages, all alike. What happens when we go East, er, I mean right. [point out right arrow]

Uh, we go further down the hallway! There aren't even any labels on anything anymore. What is this screen FOR? Well, it's for continuing the metaphor, of course. If you have a hallway, there should at least be two end to it. What happens if you enter a room? Like, say, the game room.

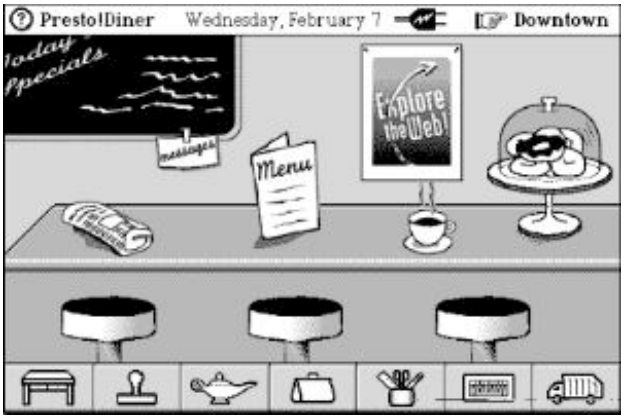


It's, uh, kinda empty. I'd better leave quick. That cat clock looks hungry.

Now hey, look, you can go downtown!



Here's our house, here's the directory…and here's the Internet! If you walk further down, you may find a diner…



And here's a Web browser.

What happens when you click on the doughnuts?

Now I don't want to criticize the General Magic folks too much. They were doing this more than 10 years ago and it's always easy to mock something in retrospect. But what's interesting is that if you extend the desktop metaphor into the quasi-virtual space as a way of extending it to portable devices, it's grossly inappropriate. How am I, Sony customer and business person, supposed to do any WORK with this thing?

Why I'm bringing this up is because the pattern is starting to repeat.

This phone from the late 90s (phone) is essentially this (greenscreen).

And Windows Mobile (windows mobile) isn't much different than this (GUI).

And although it seems like we may have avoided the literalist mistake of the General Magic design team, we are still stuck with a metaphor that treats any kind of computer as a mini desktop.

But that's not where computers are going.

This is the late Marc Weiser, the coiner of the term ubiquitous computing and the original framer of the ideas behind ubicomp. He said that "Ubiquitous computing is roughly the opposite of virtual reality." (http://sandbox.xerox.com/ubicomp/)

I agree. I define it as the practice of embedding computation into special-purpose objects, rather than trying to simulate objects in a general-purpose computer environment. To me, ubiquitous computing means treating information as a material, like plastic, bamboo or chrome. It changes the fundamental capabilities of the object you're designing in the same way that making something out of rubber is different than making it out of plastic.

I also believe that ubiquitous computing holds amazing promise for making the world a better and more interesting place. Mobile phones are the first example of widespread ubicomp, but interaction with them is mostly terrible. If we are to make full use of the capabilities of these new technologies, we must develop new ways of *thinking about* the possibilities of technology beyond the old interaction design frameworks.

I propose magic as a new metaphor for the user experience design of ubiquitous computing objects.

And let me say up front that I'm not saying that we should be trying to create actual magic or pretend that technological objects are genuinely magical. I just feel that magic is a good framework for talking about how to design ubicomp objects, so that we are not starting from scratch for every object, reinventing the wheel, from an interaction perspective.

What I'm proposing is a metaphorical relationship between magic and portable, network-aware, information processing objects which is analogous to the relationship between office supplies and computer screens in the desktop metaphor.

This will, I hope, allows us to imagine complex interactions without requiring us to explain basic ideas every time. It gives us a vocabulary and a set of examples that describe relationships between people and objects without being tied to technological details.

Now let me define what magic I mean. I don't mean augury, telepathy, rain making, clairvoyance, necromancy, demonic possession or transmutation. I'm not talking Dungeons and Dragons, Magic the Gathering, the Bride with White Hair, or World of Warcraft. In fact, I don't mean the vast majority of magical concepts that exist in every culture.

I mean enchanted objects.

Why enchantment? Because it is a widespread metaphor about *object behavior*. Ubiquitous computing objects use information processing, wireless networking, sensors, actuators and displays to engage in behaviors in the world. What differentiates them from other kinds of objects is their ability to have behaviors.

Normal objects typically do not do anything unless explicitly commanded to, but ubiquitous computing objects, smart objects, can have behaviors independent of immediate commands. That's unique in the history of people's relationship to nonliving things.

Magic allows us to talk about how all of the pieces that make up ubiquitous computing objects can fit together *from a user's perspective*.

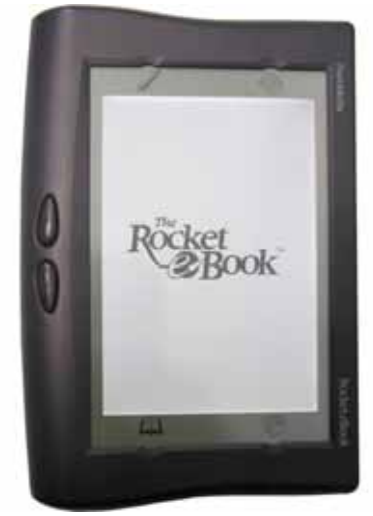
Moreover, magical objects have a number of properties that make them particularly good at presenting ubiquitous computing interaction:

1. They are everyday objects.
2. They have familiar interactions.
3. They are physical. They are not virtual objects that appear on a screen or physical representations of virtual concepts. They have a physical use mode that's built in. You don't have to teach a person to point a wand or wave it at something. Or tell them where a ring goes. Well, most rings.
4. They do not necessarily have a screen.
5. Magic objects are not humans, and we do not expect them to act human.
6. They are not superhuman. They may be hard to control, but ultimately it is we who are in control, not they, by definition. They are not our superiors, which much user experience design doesn't always make clear.
7. There is a healthy disbelief in magic, so it's already going to be treated as metaphorical. Concepts like ambient intelligence, which is what ubicomp is called in Europe, are more ambiguous. Do you REALLY mean INTELLIGENCE? Something that is like me?

Most importantly, many of today's technological objects already tap into this metaphor, although not explicitly. Let me show you.

Image found on Flickr, http://www.flickr.com/photos/mikekellyisafox/209800828/

This is the Ambient Orb from Ambient Devices. It's probably no accident that it looks like a crystal ball. As an ambient display device, its design taps familiar imagery to make it more comfortable. What imagery is it tapping? Magic.



This is the Rocket eBook, the first serious attempt at creating an eBook. It was explicitly not a laptop, but a kind of book with only one page.

Cursed Spellbook by Veronica V. Jones, found on http://www.moonshines.com/cards/Cursed-Spellbook.html; Rocket ebook

This is the Sony Eye of Judgment card game. It's a card game like Magic the Gathering, but in addition to just putting the cards down, if you have a camera on your PS2 then it uses image recognition to make the cards "come alive". You have a battle onscreen with the images by gesturing over them. For example, you can choose which of your opponents' cards get sent a fireball by which of your cards by waving your hand across the appropriate card.

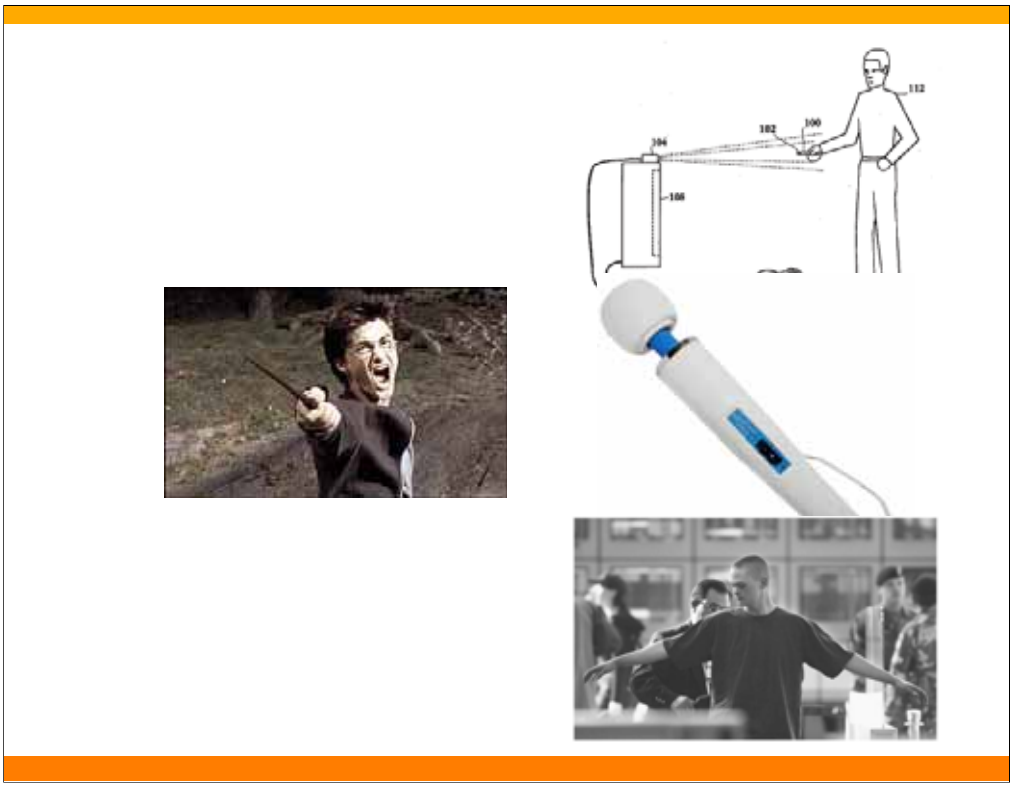
This is one of the only objects here that's not an actual shipping product. It's a concept for a memory ring that heats up one day a year to remind you of an anniversary.

Fantasy ring by Veronica V. Jones, found on http://www.moonshines.com/cards/Ring-of-Spiritwrack.html

Remember ring: http://www.alaskajewelry.com/remember-rings-never-forget-anniversary-p-2040.html

This is Nokia's Medallion, which came out about 3 years ago. It lets you upload pictures from your phone to the medallion, which then scrolls through the images.

Nokia Medallion II



This is from a patent Sony filed for a game controller. The Wii controller is another obviously similar device, but there are already many wandlike devices. Here's (Hitachi) Hitachi's Magic Wand, and most of you will recognize this bit of necromancy (airport).

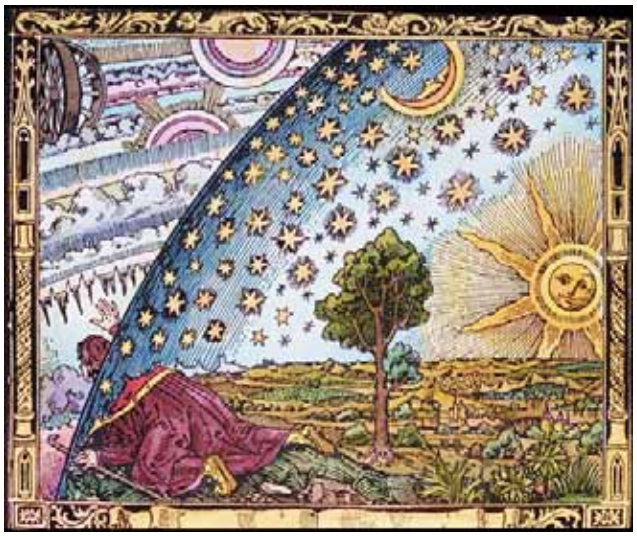
Sony magic wand patent

Hitachi Magic Wand

Here's a particularly fanciful piece of technology that came across the gizmo blogs a while back. If you didn't see it, it's a Japanese USB Lodestone. You put pictures of things that you lost on it and it'll find them for you, just like Jack Sparrow's compass in Pirates of the Caribbean. Obviously actual compasses and sextants were replaced by talking GPS receivers.

Amulet from Solid Alliance

And now we even have enchanted animals. The Nabaztag rabbit is an responsive ambient display device, but it's also an explicit personification of data display.



So, in conclusion, the age of magic is coming.

Chip manufacturers low-power roadmaps and congealing wireless communication standards ensure that there are going to be many more objects like this.

I believe that we need to systematically approach the user experience design of these devices. One way that's been shown to be successful is the adoption of a strong metaphor that can be leveraged to explain the functionality of many of the ideas embedded in a new set of technological tools. I believe that magic as a metaphor is an incredibly rich vein that can be mined for interesting and familiar user experience design tropes. It would be a mistake to pass up the opportunity to use it extensively at this early stage in the proliferation of these devices and ideas.

Thanks!

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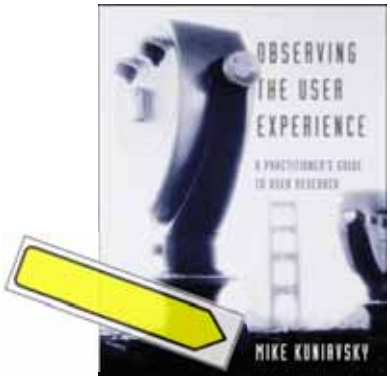

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