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## connectedland

November 2002

### A cellar, a tornado

I've always had a desire to make the area where people, design and technology meet my playground, but I think I fell in love with the idea of a connected culture in 1996.

What somewhat brought it all together, and pointed me in the direction I am still following professionally today, was one of [Fritjof Capra's](#) books, "[The Web of Life](#)".

Coming from a slightly more philosophical and ecological angle Capra created a coherent scenario, coupling Chaos and Complexity Theory-derived concepts with intuitions driven by the emerging internet phenomenon. He envisioned that the western world and its underlying cultural matrix were shifting towards a new *network* model.

Even though he was not the only one to do so, just like others, he was right.

Needless to say I've been interested in understanding where that model would take us and our culture ever since.

As far I know the seeds of what's blossoming now were planted in those years.

Research projects clearly showed that entomology would be the source of inspiration : MIT had [Locust Swarm](#) while Xerox had [Pollen](#).

They were all dealing with limitations and uncertainty with "how" the information would be shared over the network, but soon other research projects such as MIT's [Hypos](#), languages like Sun's [Jini](#) and transmissive technologies like [Bluetooth](#) started providing some of the missing answers.

All considered though, the first real *enabler*, at least in Europe, was the GSM phone. Its adoption spread like wildfire and introduced the idea that technology could be *mobile*. Just like us, really. Even more importantly the cell phone started to drive in people's minds the idea that anybody could be reached by anybody, all the time, anywhere.

In a few years SMS-crazed teens around the world were showing adults glimpses of what was lying ahead.

### Life in the new land

Today we are connected to one another and to an amazingly vast amount of data through many different wired and wireless technologies. [WI-FI](#) and [Mesh Networks](#) have been turning old visions into everyday life.

Human beings are increasingly surrounded by devices that keep their connection to "The Network" alive all the time. PCs, PDAs, cell phones, information appliances, e-pliances or however you want to call them, have found their way in people's offices, homes, cars, pockets. Hype notwithstanding the so-called "always-on", connected society is happening.

Sorry, it *has* happened, and we are starting to see the first tangible effects of its underlying model.

Newspapers like the New York Times and Washington Post recently published **articles** describing the swarm-like behavior of large groups of people coordinating their collective interaction. Virtual community pioneer **Howard Rheingold's** new book, "**Smart mobs, the next social revolution**" deals with similar themes and will surely be followed by many more. Studies in the area of **Social Network Analysis** show the complex inter-relationships that have been developing between people and content. As **Peter Morville** says:

*"We use people to find content. We use content to find people. Success in the former requires we know what other people know and who other people know. Success in the latter demands good search, navigation and content management systems. We might also think of the documents themselves as "human surrogates," representing the knowledge and interests of authors. And of course, we humans also serve as surrogates for one another."*

Networks.  
Information, available on the network.  
People, available on the network.  
People who know people.  
People who know content.  
People as content.  
Content as people.

To me all of the above simply means that the medium is finally starting to reveal the message.  
Or, I am tempted to say, the message is *emerging* from the medium.

### **Precious yellow bricks along the road**

If the effects of The Network have already started affecting our lives they have also created amazing opportunities for the design community to shape the way human beings relate to the information available on The Network and, even more importantly, to each other. In the near past the main issue had to do with managing *information anxiety*, a state of mind where too much available data makes it impossible for a person to think he/she "knows enough" to feel comfortable in a certain domain of knowledge. As **Richard Saul Wurman**, who first defined the concept itself, says:

*"Information anxiety is produced by the every-widening gap between what we understand and what we think we should understand. Information anxiety is the black hole between data and knowledge."*

In this scenario part of the Interactive Design community's main focus has been to try to figure out how to help people distill the always-increasing available data into knowledge, by making it accessible and digestible. While disciplines like Usability and Information Architecture have risen to offer some of the possible answers, we can hardly claim we have been completely successful. Most industries are still far in their product development processes from User-Centered Design practices, and the results are under everybody's eyes. But even though information anxiety is and will continue to be an issue we'll need to help address, being always connected to The Network is changing the way people *relate* to information itself.

A revealing moment for me happened while reading Eric Scheid's [IA Wiki's](#) pages on [Emergent Architecture](#):

"...so by having just enough information for the next step and trusting fluid interaction with the information space users avoid information overload and information anxiety..."

I couldn't agree more.

The always-connected *artifacts* we carry with us are slowly eroding the idea that we should know *all* the information we need to complete a task. A few examples? Most people I know hardly set a specific appointment (date, time, place) with anybody anymore, as they all trust mobile phones to allow them to hook up at the last minute or so. Phone numbers themselves are gone from memory, as they are always handy on silicon in a pocket.

The same can be said for driving direction to an unknown place: once a "bird's eye" travel plan has been established it's easier to rely on GPS or phone-driven data to pin-point us where we want to go.

It's as if the *granularity* of the knowledge we feel we require to move comfortably in certain domains has changed.

All of the above also resonates with what people like Peter Morville (again) have been saying about "[The Age of Findability](#)".

By now we've *learned* there's already more data "out there" than we'll ever need so we won't even try to gather and absorb it all.

With varying levels of confidence we increasingly rely on the fact that the information we need will be accessible *just* when we need it, wherever we are. What matters then is that we can quickly find it.

From a world where people's main issue has been *managing information* we might be thus evolving to a connected world where problems will also come from *managing interaction*. With content. With other people. With the devices that allow us to interact with content and people.

A world where *fluidity of interaction* with information will be at least as important as information itself.

A world where we'll fear being cut off from The Network, with the resulting inability to access our sources of knowledge.

A world of *interaction anxiety*.

In this scenario the focus will partially shift from helping people filter the ever-increasing amount of available data into knowledge, to helping them manage all the complex interactions with information and with the various devices that allow them to access that information. Other people included.

All the considerations above are already significant today, when we are trying to access the *same* information with *different* devices.

Think about even very simple things, your contacts and phone numbers for example.

I personally have some of them on my phone's SIM, some of them on my computer's email client address book, some in my web-mail contacts page, some long forgotten in my old Palm.

How many times has it happened that you didn't have the "right" information with you? Or is that the "right" device?

Where should the information be stored anyway?

Somewhere on the network? Or should it be on a "master" storage unit you control and accessible through the network?  
And what about the many different interfaces you need to learn to access and manage and interact with that information?

### Behind the curtain, an old man

How do we help making Connectedland a better place for people?  
The obvious answer is an old one: by designing artifacts so that they are *transparent* to user needs and desires.  
But what does "transparency" really mean in this case? My favorite definition is actually a *meme* from IDEO's [Naoto Fukasawa](#):

*"Design dissolves in behavior."*

What Fukasawa originally meant, or at least what I think he meant, is that the real value of an artifact lies not only in its physical and esthetical characteristics, but in its behavior, in the quality of the experience we have using it.

But what that phrase inspires me to think is that the *artifact itself* should dissolve into a *user behavior*. People need not "think" to exploit its potential.

What that phrase means to me is that artifacts designed to "dissolve into behavior" should fit seamlessly in the flow of users' thoughts and actions. Consider a hammer, for example.

When holding a nail against a wall what anybody would like to do is to simply be able to turn a hand into steel and pound the nail into place. A hammer does just that and furthermore it extends the reach of the user's arm to increase his/her strength.

This is a good example of what a *tool* is, an artifact that enhances the users natural abilities allowing him/her to efficiently and effortlessly achieve his/her goals.

A hammer is designed to dissolve a need into a behavior.

Question: How many PCs, Cell Phones or hand-helds can be used in such a fashion?

Answer: none. They often force us to re-think our goals and desires in terms of processes and means to achieve them.

Take even commercially successful examples, take the Palm and its data input method, Graffiti, for example. Here's a very expensive, beautifully designed artifact that forces us first to re-learn how to write to exploit its vast potential.

Why has this been happening?

Well, for one reason because the "desktop" metaphor, conceived in the 1970's in Xerox PARC's labs, made famous by Apple and commoditized by Microsoft, has become by all means a de-facto standard.

Even now that this model has lost part of its effectiveness it has ultimately permeated most interface designs that involve a screen.

The desire to provide users with a flat learning curve has created an "adhere to known principles" effect stigmatized by [Alan Cooper](#) in his book "[The inmates are running the asylum](#)":

*"What do you get when you cross a computer and a camera?*

*A computer.*

*What do you get when you cross a computer and an alarm clock?*

*A computer."*

What do you get when you cross a non-digital, everyday object with enough processing power to change its nature? An artifact that behaves and feels like a computer.

This is more and more evident in the newest breed of connected devices: as they are becoming more powerful they are converging on user interfaces that look and feel like personal computers.

My new **Nokia 7650's Symbian OS**-based user interface has a pointing device (a joystick), an icon-based menu and a file manager. I don't "call someone" anymore, I "launch" my "contacts" application, and decide if I want to "call" him/her or "create a message" and so on.

If on one hand this adoption of a known model has made it *supposedly* easier to learn to use new devices that relate to it, it has also flattened any opportunity to optimize the interaction to the task and the device. **Don Norman's** vision on Information Appliances, expressed in his book "**The Invisible Computer**" has so far had dubious success. We have given up transparency for the sake of speed and ease of adoption. In other words, behavior has been adapting to design.

### **In search of real magic**

To make the Network Society a better place for human beings we need to look at the design of artifacts designed to dissolve desire into behavior. What follows is a quick zoom, from network-wide to the human scale, of interesting directions that might one day make Fukasawa's phrase a reality.

Huge potential lies within current efforts with the **Semantic Web**, or SemWeb.

While most of the activities in this area seem focused on technological aspects, one of the core ideas behind the SemWeb is that information will end up "speaking for itself", relieving human beings of the burden to check its relevance and trustworthiness. Successes in this area would thus enable easier, more humane ways to find and relate to resources. As **Aaron Swartz** says:

*" For some, the defining feature of the Semantic Web will be the ease with which your PDA, your laptop, your desktop, your server, and your car will communicate with each other.*

...

*For others, it will be the ability to assess the trustworthiness of documents on the Web and the remarkable ease with which we'll be able to find the answers to our questions, a process that is currently fraught with frustration."*

To get a glimpse at what the Semantic Web might soon bring, you only need look at what **RSS** feeds have already enabled. The use of tools like **NetNewsWire** has given users access to information in its rawest form and full control over its presentation layer, effectively bypassing a site's user interface design (a situation that incidentally should have pleased **Jacob Nielsen** by making **one** of his most absurd and **debated** predictions suddenly relevant).

The Semantic Web and what it implies will also turbo-charge a **Ubiquitous Computing** and *diffuse intelligence* scenario where complex, intelligent-like behavior could emerge from combining apparently simple behavioral patterns .

Without disturbing the realm of Artificial Intelligence I am simply envisioning a world where connected artifacts will share context-sensitive information that will have users perceive things happening "as if by magic", without their direct intervention.

How many times have we entered a meeting room and forgotten to switch our phone to "silent"?

In a Connectedland scenario the meeting room would "know" what *basic* characteristics human being usually associate with that kind of environment, for example expecting "silence" or "not to be disturbed". All it would take is for the room's "intelligence" to inform your phone and the phone should only "know" how to adapt to those instructions, or *where* to find *what* those instructions mean.

Similarly your *Personal Digital Tools* could surround you with a *data-cloud* about yourself that would inform the environment about certain expectations or needs you might have, for example informing other artifacts that you are hearing impaired so that their interfaces could adapt to your specific needs. From mixing these apparently simple behaviors you'd get interactive objects that would start showing what **Nathan Shedroff** has called "**Computer Human Values**":

*"Interfaces must...be more aware of themselves, of their surroundings and participants, offer more help and guidance when needed, in more natural and understandable ways, be more autonomous when necessary...adapt more automatically to behavior and conditions."*

In this case a human-centered approach to machine-to-machine interfaces would act as an enabler to reduce the stress posed on people to act as "synchronizers" among the supposedly intelligent artifacts that surround them.

A slightly more futuristic interpretation of this scenario is that interfaces could slowly become *invisible*, taking the "dissolve into behavior" theme to its extremes. The most fascinating (and fashionable) ideas in this direction look at turning thin air into an interface tool, an idea movies like **Final Fantasy** and **Minority Report** have already visualized for the masses, and people like **Adam Greenfield** have recently addressed.

What *I* personally feel is the most intriguing and promising direction in the short-term is the upcoming integration of *RealSpace* and *DataSpace*, using **Yoz Grahame**'s words: through the new connected devices we'll overlay and integrate physical objects and spaces with digital information.

These ideas has long been part of research projects or even corporate design visions such as Philips' "**Visions of the future**", but lately designers like **Anthony Dunne** and **Fiona Raby** and companies like **Ambient Devices** have started turning them into products.

The integration of mobile connected tools with GPS-like features that enable "location based" services, possibly hold the greatest potential to ease user's lives by providing personalized information that's also relevant to the context (time, space) where the information is accessed. At the heart of the use of a GSM mobile phone lies the principle that The Network (the operator) has to know *who* I am (through my SIM card) and *where* I am all the time. This fact opens up very interesting possibilities that go from the basic and obvious marketer's "show me the closest gas station" concept to really interesting ideas with strong social implications, such as those highlighted by collectives like **Headmap**. Obviously the potential for a "Big Brother" scenario in this case is a real possibility, and again I think the Design community as a whole should try to lead developments in this area in a direction that will allow users to be

in control of the information *they* generate and to benefit from it, also economically.

The merging of physical and digital experiences also brings up an old desire of mine to see the Interactive Design and Product Design communities come together, as it should have been in the first place.

### **The infamous final words**

This article is far from providing a real overview on what's happening on the *edge of chaos* in Connectedland.

We haven't even touched themes like Agent-based interfaces or innovative user interface concepts such as those you'll find on sites like [Nooface](#).

Hopefully though some of the ideas above will have you think a bit about what's lying ahead and how you'll want to play a role.

Where would I like to be?  
Smack in the middle of the maelstrom.  
See you there.

### **A-knowledge-ments**

This article is a typical example of the power of connected-ness, and it would not have been possible without all the great *voices* that help me daily to expand my horizons: [Matt Jones](#), [Dan Hill](#), [Matt Webb](#), [Peter Merholz](#), [Adam Greenfield](#).

Particular thanks to [Nathan Shedroff](#), who has been kind enough to review and discuss the article beforehand...even though he doesn't share my concerns over interaction anxiety.

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