



# Calm Tech, Then and Now

re:form interviews John Seely Brown on  
the paradox of information overload and  
designing for the periphery

*This interview is a revised version of "[Calm Tech, Then and Now](#)," originally published by re:form on Medium and presented by BMW on August 11, 2014. It has been edited for clarity and more detail by Capri Mali LaRocca.  
Photos by Talia Herman.*

*“In the twenty-first century the technology revolution will move into the everyday, the small and the invisible. The impact of technology will increase ten-fold as it is imbedded in the fabric of everyday life. As technology becomes more imbedded and invisible, it calms our lives by removing annoyances while keeping us connected with what is truly important. This imbedding, this invisibility, this radical ease-of-use requires radical innovations in our connectivity infrastructure.”*

—Mark Weiser

**More than twenty years ago**, then-Xerox PARC chief technologist Mark Weiser began articulating a prescient vision of the next wave of digital technology. His concept of Ubiquitous Computing, or Ubicomp, anticipated the arrival of tiny networked sensors and the Internet of Things. More radically, he saw the resulting explosion of information leading to a new “calm” design movement as an antidote to the far more common experience of tech rage brought on by poor user experiences and data overload.

Weiser died of cancer in 1999 at the age of 46, but his ideas seem more relevant than ever. *re:form* sat down with Weiser’s PARC colleague John Seely Brown (JSB) to revisit the origins of calm technology design, and its subsequent arc. We’re also republishing by permission a joint paper by Weiser and Seely Brown, “The Coming Age of Calm Technology.”

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**re:form** To kick things off I just want to mention this interview is the result of some research we’re doing for a new design collection that we started on Medium. It’s called *re:form* and is sponsored by BMW. We came across your paper with Mark Weiser at Xerox PARC from 1996 titled *The Coming Age of Calm Technology* and we thought, wow, that’s very prescient, yet seems to be discussed very little these days despite increasing information overload and tech rage. Maybe it’s time to bring those ideas back into the design conversation.

**JSB:** Glad to be here. It’s actually quite ironic that this is sponsored by BMW because when Mark and I first spoke about calm technology, we were talking about the BMW motorcycles we both used to drive. I happen to be a motorcycle fanatic and the amount that has influenced my personal thinking on this topic is astronomical.

The reason motorcycles were so important is twofold. The first has to do with ABS brakes. They are the most beautiful example of calm computing because they anticipate your needs and automatically assist you when you need help, yet you're completely unaware they're there. It's an interesting anticipatory context, where micro sensors notice when things are about to go wrong and make subtle adjustments without interrupting the driver.

ABS brakes seamlessly move in from the periphery to the center, help you, and then back out again. The beauty is that it's a tremendous technology that is dramatically enhancing your ability to drive in a wide variety of conditions, but you're completely unaware of it. That brings a sense of calm and that was one origin of designing technology for calmness.

The second origin of calmness also comes from motorcycles. I often drove along Skyline Drive on my motorcycle and one day I realized—because we tend to drive down that twisty stretch very fast— that I was processing so much more information riding a motorcycle down Skyline Drive than any time spent sitting in front of one, two, three, or four screens.

Yet, I never felt any information overload. Why? I began to realize that lo and behold if you are still alive and a motorcyclist that you are doing a very good job processing the periphery, as well as the center. Suddenly I began to realize that the way you cognitively process the center has to do with the standard ontology of objects and predicates.

Due to the way our brains process the periphery, we're subconsciously aware of properties that are independent of objects. We notice properties like the color, shape or speed of an object in the periphery, but the object itself does not come into direct interpretation. For example, you might see something move quickly in your peripheral vision. You can't put a name to it – and maybe it's the case that you don't care what it is – but what's important is that your brain takes a weak signal in the periphery and alerts it to the center. It says, "You've got to be prepared to pay attention." It lets you shift seamlessly to bring that part of the periphery into the center of your attention and helps you quickly shift to a different context.



A good motorcyclist is processing huge amounts of peripheral information and much of that is being processed subconsciously. There is a tremendous sense of calm in streaming through the hillside at one hundred miles an hour or more, depending where the curves are. It's a state of flow as the periphery is flying by, and the cyclist is completely in sync. They don't have to pay attention to every bit of information, yet they're in the moment and so focused, looking straight ahead. It's that occasional sense of harmony with the world. But the instant something unusual happens in the periphery that doesn't make sense one way or another, it alerts your conscious mind to shift focus and pay attention. Most people don't realize that's what's going on.

People used to push back. They'd come up to us and they'd say, "I don't want calm. I want exciting." I'd say, "Calm and exciting can go hand in hand. What you don't want is to be overwhelmed with information or bogged down with

nonsense.” Solving that is what we’re interested in.

So, the thing that initially brought Mark and me together was phenomenology. Take a blind man and give him a cane, preferably his cane. Sitting in a chair, he can tell you everything about the handle on the cane. As soon as he gets up and starts walking however, that handle completely disappears and becomes much more like a wrist. Very few of us can truly explain the feelings and protocols that happen at this junction here [points at his wrist]. We focus on what we’re touching with our hand, not what’s happening with our wrist. It completely disappears.

With that in mind, we were interested in what enables technology to profoundly disappear and let you look through the information or look through the interface onto the domain – just like how the blind man’s eyes are now touching the concrete, so to speak. The technology disappears in the same way that the cane disappears. So we were exploring how we might design technology that lets us look *through* the screen instead of *at* the screen and then play with the information as if there’s no screen there at all.

The more we started thinking about this, the more we were led to a counter-intuitive idea. Mark said we will always feel information overload unless we increase the amount of information that we have to process by a factor of at least ten. If you go by a factor of ten, then you stop thinking about putting more information on screens. It becomes more like driving down Skyline Drive; you can’t process all of the information in front of you, but through a synergistic relationship between the center and the periphery, you can reach through the information and on to the world with a sense of calm. You start thinking in a different way and that’s what got us focusing on how we process the total context.

It led to our fascination with the “Dangling String” that we describe in *Designing Calm Technology*. The string is an eight-foot piece of spaghetti-like plastic that hangs from a small electric motor mounted in the ceiling. The motor is electrically connected to a nearby Ethernet cable, so that each bit of information that goes past causes a tiny twitch of the motor. A very busy network causes a madly whirling string, the string whipping through the air

producing a characteristic whirring noise that changes octaves depending on the speed. A quiet network causes only a small set of twitches every few seconds. Placed in an unused corner of a hallway, the dangling string is visible and audible from many offices without being obtrusive. It's continuous noise and movement in the background communicates information without you having to focus on it, thereby expanding your peripheral vision. In a sense, you are attuned to it without having to attend to it. You can hear when it's twirling faster and the frequency shifts – that's the peripheral cue. You're not meant to look at the string; you just know this weak signal has changed.

Only when your flow gets interrupted by your machine slowing down do you become more attuned to what's happening around you. You enter a state of confusion and begin to look around for cues. It's clear whether or not the network is the problem based on whether or not the dangling string is spinning rapidly. A madly spinning string indicates an overloaded Ethernet is causing the problem. A slowly spinning string indicates the problem is elsewhere. Then you can attend to the issue and the string fades back into the periphery.

It's the same way that you might be hard at work at a conference, but notice when it's approaching lunchtime because suddenly you're aware of...

*r:f* People getting up and moving?

*JSB:* Yes, people moving and getting restless. You become aware that the noise and movement are signaling a change...and you start processing differently. So it's the sense – phenomenologically speaking – of how do you become attuned to information on the periphery? Attending and attunement are slightly different. We can attune to the periphery without having to consciously interpret and attend to it, and that ability is essential for maintaining calm in a world of information overload.

In computer science, user interface people often talk about making things user “centric.” Most user centric design focuses on understanding how people interpret information on the graphical user interface (GUI) and how to display information to make it most intuitively graspable. Similar to how an artist

will know how to draw your eyes to the center – to what’s important to pay attention to – user experience experts know how to design interfaces that draw your eye to the important information.

*r:f* So, how is this device [points at iPhone] user centric? Do you imagine it as basically a PC in your pocket?

*JSB:* Yes, and we did. In fact, I think it was 1998 and Comdex, the Computer Dealers’ Exhibition, showed the material that Roy Want had done with Mark and myself. We embedded all kinds of MEMS accelerometers – devices that measure acceleration – into a PDA. We actually showed a digital Rolodex on the PDA that...

*r:f* That flipped the page.

*JSB:* Well actually one where the pages flipped when the PDA was tilted. You never had to touch the interface for that to happen. Similar to newer systems today where you can shake a device to erase things, the PDA was picking up gestures directly. When you tilted it, the pages of the Rolodex fell as if influenced by gravity. It was the most natural thing – you tilt it and the pages start to turn. Great user centric design makes you almost unaware that there’s an actual interface. It’s more like having a gestural conversation.

Today you can see Amazon taking it much further than any of us ever thought possible with the Dynamic Perspective sensor system on the Fire phone. They have taken the whole notion of gestural conversations to the extreme with devices that respond to subtle hand tilts and head movements. Map displays are partially 3D and change perspective based on your movement. Immersed in a game you can turn your head to look around virtual corners and obstacles. Depending on which direction you tilt the phone, specific content like menus or photo carousels are revealed. Phenomenologically speaking, you extend your social practices onto the device and the device becomes an extension of you. And that transforms into a whole new world.

*r:f* So how far do you think we’ve come in terms of designers understanding and working on the problems of calm technology? Would you consider a



device like Google Glass a step in the direction of calm, as you described it earlier, in the sense of seeing through the information and past the screen?

**JSB:** There are a lot of reasons Google Glass is interesting. Why I consider it interesting relative to this conversation is something I've never talked about much and it's how Google Glass leverages Google Now. That's to say Google Now is gathering so much information about you – if you've been using it all the time in Gmail and all the other Google services – that it's capable of anticipating what you need.

It's the beginnings of an anticipatory system. The way Google Glass works you don't need to give it instructions. It anticipates what you need and that anticipation is a kind of context awareness. By codifying your context, actions and your propensity for that context, it knows what you've done, where you are and where you likely want to go next. Combined with a pretty simple



stroke interface and limited speech recognition instead of a keyboard, the interface starts to disappear and you and the device become one.

In that sense, Google Now understands the context very much like we do when processing the periphery. However, it's using a completely different set of cognitive mechanisms, I think, than what we're used to in terms of how processing the periphery actually works. Still, it strikes me as the first attempt that Google Now is making – for the purpose of Google Glass – to build and amplify an anticipatory system. It is a huge step, one that can completely transform our experience of interacting with the world.

**r:f** At the same time it feels like Google Glass is an enraging technology for many people when they are on the other side of that screen. Is attempting to address how devices can be enraging part of your concept for designing calm technology? For example, how parents can get angry when their children are constantly absorbed in their phones?

**JSB:** No, we were looking more at how to build anticipatory contexts over our systems, but part of examining how technologies engage our attention involves addressing why some are enraging while others are encalming.

In fact, it could be very interesting to build an anticipatory system like Glass without the camera lens. There are a lot of things we can do to mitigate the fact that people think they're being photographed. You could put in only a fundamentally defocusing lens so it would pick up qualities, not objects and predicates. It's a random new idea, but I mean it's interesting. We may be able to have devices that don't intrude. You'd be surprised what you might be able to do...

**r:f** So what areas of design do you see calm technology being most actively developed right now? What is not being developed where it ought to be?

**JSB:** Well let me go back to your field here. My first book was called *The Social Life of Information* and it discusses how books are social artifacts. Well-designed books have all kinds of affordances and cues to them that help you read the book; you know how to open a book and turn the pages. Usually when

you think about a book you think about the content, not the structure. A lot of attention went into the cover, the spacing, the typography, the chapter layout and so on. This is because all of the affordances that the physical artifact provides are almost all subliminal and you don't necessarily think about them directly.

The design of that artifact achieves an amazing sense of communication and – in some sense to a lot of us – a calming factor. In contrast, I have a hard time getting used to electronic books and the fact that many of the cues that I subconsciously enjoy just aren't there.

I see electronic book readers trying to keep up sometimes by creating fundamentally new forms to help compensate for the lack of cues – such as turning a page – that those of us that love physical books look for. To do this successfully requires taking the broader field of affordances around us more



seriously. How do we design the affordances in the new medium to provide some of the cues that the old medium provided in terms of reading context, not content. We tend to overlook the generative dance between context and content.

*r:f* That's interesting. It reminds me of calm reading and the calm reading movement where people are taking web pages, stripping them down, and removing a lot of the clutter to really focus on a much cleaner space for reading. It's a reading context that is much more conducive to engagement and focus. Medium pages are designed that way.

*JSB:* Yes, I think Medium knows more about design than many other publishers today. There are a lot of other factors that go into the subliminal affordances that you can also look at. The actual page layout matters and how that page gets read. Think about the page layout of a newspaper. How do you decide what story should be adjacent to another? How do you orchestrate serendipity?

Well-designed newspapers—which we don't have much of anymore – have front-page designers that understand what's happening above the fold versus below the fold. They understand how adjacent articles might capture your eye, even if you didn't necessarily think you wanted to know about the topic. They're capturing enough to make you say, "Oh." These newspapers actually orchestrate serendipity for you. But to orchestrate serendipity, you have to be a darn good designer.

Ubiquitous computing makes orchestrating serendipity even easier. It reminds me of back at PARC in the early nineties when we put the coffee pot on the Ethernet. It was the Internet of Things before the Internet of Things! The coffee machine would announce on the Ethernet when a fresh pot of coffee was ready, prompting people to get up and go where they were bound to interact with other coffee-hungry employees. That's orchestrating serendipity. What's more is that we had a floor to ceiling whiteboard next to the coffee pot where people could write down ideas so that the whole discussion would be rendered or given enough context for others to quickly enter the conversation. A digital camera was there to take a snapshot of what was on the whiteboard

so that people could take it back to their own office and continue working on it if they wanted; it helped scaffold the serendipitous conversations for later expansion. A lot of thought went into making it an inviting space where if you chose to participate you could get up to speed quickly. The space was transformed by putting the coffee pot online into a nano creation space where context was captured, rendered and designed to foster emergence. The technology fades into the woodwork and people are able to focus on the ideas and interactions with each other. Ubiquitous computing really amplifies what you can do.

**r:f** I hear you have a new book. What's it about?

**JSB:** It's called *Design Unbound: Designing for Emergence in a White Water World* by Ann Pendleton-Jullian and myself. It presents new tools, skills and methodologies for addressing today's most complex issues and by complex we don't mean just complicated, we mean issues that don't lend themselves to fixed solutions at all: education, overpopulation, water shortages, climate change...to work in and on these problems requires more than working on things in contexts. It requires that we work on the contexts themselves.

So the book starts with an operational construct about how to have agency in the twenty-first century. We then present a series of toolsets that are strongly influenced by architectural methodologies – landscape design, urban design – but supercharged for this specific type of work. The types of problems we're addressing are unique to the twenty-first century where technology-fueled change is happening at an exponential rate. I'm fond of saying that we're now living in a "white water world," where in order to be successful we must be more like the white water kayaker – skillfully reading the currents and disruptions of the context around us. We must respond in real time and to novel problems for which there is no guidebook to reference. Innovation arises – most often – in action. Therefore *Design Unbound* also presents a series of case studies from fifteen years of practice – both Ann and myself – on projects in the field that have not been able to be approached with the old toolset and from others who have brought about major change in difficult, highly intractable environments and on highly trans-disciplinary, radically contingent – otherwise called wicked – problems. The methodologies we discuss go beyond the content of these issues to address and design contexts specifically.

Calm technology is very much related in that it also elevates context to a first class item for consideration.

*r:f* When you talk about designing calm technology, it sounds like a prescription for using technology to solve the problems of technology. Would you say that's fair? Some people might say it is a cultural shift that's required to get control of our devices and our information obsession, and not so much a problem of more and better design engineering.

*JSB:* I wouldn't say calm technology is going to solve all the problems associated with technology. We never viewed technology as solving the problem. We often viewed technology as a complicating factor since the design was rarely informed, and that's the whole thrust of this new book. It's really re-thinking the design game and up-leveling our relationship with technology through the kind of aesthetics that architects have where the interplay between context and content or landscape architecture and building architecture work hand in hand. So, as the world gets more and more complicated, I think that the need for designing context increases exponentially. And sometimes you've got to really break the paradigm and think about design in brand new ways.