

Smart Places/Discreet Computing

Towards the Application of Appropriate Technology in Creative Business

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Digitally-mediated communications are now essential to creative businesses. However, the wholesale adoption of desktop-centric personal computing has created new challenges for organizations whose success depends, fundamentally, on social interaction and creative collaboration—too often, the digital tools brought in to assist workflow and communications have instead obstructed genuine collaboration.

This whitepaper suggests a radical framework for change, exploiting recent development in social network analysis and emerging communications technologies to restore the primacy of interpersonal communications to the creative workplace.

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Context

COLLABORATION DRIVES CREATIVE BUSINESS

Social networks are at the heart of creative business. During the '80s and '90s, progressive businesses responded to this insight through workplace innovations. Hot-desking, free-form physical environments and mobility were intended to provide opportunities for project teams and communities of practice to self-organise. At the periphery of these task-based clusters, free-form spaces encouraged serendipitous interactions between people and teams who would not otherwise come into contact.

True collaboration in creative business takes place in a *space of flows* [1].

THAT GREAT SUCKING SOUND

However, at the same time that creative businesses were tearing down office walls, these businesses became increasingly dependant on PC-mediated communications and workflow processes.

Unheeded by most, the wholesale adoption of personal computers in creative businesses had engendered a deep, yet subtle malaise—no one noticed the gentle sucking sound of attention being gradually relocated from real-world social context to the screen.

Computers were adopted to simplify document production and to free people's attention from mundane tasks. But often, people's valuable attention has been simply redirected *into the screen*, rather than being freed for interaction and genuine collaboration with colleagues, clients, suppliers and the outside world.

There are many ways that standard legacy personal computers suck attention:

- **Physical presence:** desktop workstations and laptops become the focus of people's personal space. Screens need to be in front of people, blocking sight-lines. Workspaces are organized around the physical requirements of the beige boxes, rather than the social needs of people.
- **Deep interfaces:** Most systems require time and attention to access—users need to devote their attention wholly to the screen, in order to mouse into, navigate, and retrieve information.
- **Mode switching:** Moving from real world interactions to screen-based activity requires mental mode-shifting, and different cognitive skills. PCs demand that you deal with them on their terms, using metaphors and assumptions that enforce particular mental processes.

Tools are not neutral. The Law of Unintended Consequences means that we must be constantly vigilant if we are to understand the working practices and metaphors which legacy systems tacitly enforce.

WHAT LEGACY SYSTEMS DO WELL

So, before we look at the future, let's consider the positive legacy of the past: what useful services do legacy-computing systems provide, and where are they betraying the desires of a modern creative business? Let's draw some lines in the sand.

Personal computers were originally conceived to be personal workstations for document production, a role at which they excel. Legacy computer systems are excellent tools for online research. They provide an effective platform for multimedia, and are essential for communication between distributed workgroups in networked global businesses.

But the central metaphor is still that of the *personal* computer. Although the interface metaphor is 'the desktop', that 'desktop' is more attentionally consuming than the physical object it references; the screen itself demands constant focus and interaction. Personal computers are extremely *lean-forward*—it is very difficult to lean-back and reflect while interacting digitally.

A Better Way: Discreet Computing

Discreet: \Dis*creet", a. Possessed of discernment, especially in avoiding error or evil, and in the adaptation of means to ends; prudent; sagacious; judicious; not rash or heedless; cautious. [Webster's Revised Unabridged Dictionary]

How do we 'only connect' the real-world social networks at the heart of creative work with the behind-the-screens systems which provide those networks with information and connectivity? The need for electronic mediation is real—especially for businesses operating in multiple locations and time zones. But the issue is how to maximize the connection between people, and minimize the attentional *suction* of screen-based interfaces.

Once attention is seen as a valuable resource, different attentional needs and opportunities can be identified. In the next sections, we consider *when, why* and for *how long* information needs to be visible, and how best to use digital tools to support rather than inhibit human interaction. We argue for a conceptual shift from legacy *personal computing*, with its baggage of limiting metaphors and implicit constraints, to a future of discreet, *interpersonal computing*: technology platforms which support social networks, which refract rather than absorb attention, and which free up working environments for practices based around people.

Discreet Computing systems:

- *Are lightweight, and link knowledge-holders together so they can communicate directly with each other. Discreet systems always loop information back into the social network within which information, tacit or explicit, has value as knowledge.*
- *Make information available through a glancing encounter, rather than by demanding undivided attention and conceptual mode-shifting.*
- *Acknowledge the distinct functions of computing devices—document production and interpersonal communication—and deliver these functions in ways appropriate to user needs.*
- *Are physically, as well as conceptually, discreet. No more Big Beige Boxes. Discreet computing hardware is there when you need it, and easily moved when you don't. It is cheap, reliable, and unobtrusive.*
- *Facilitate the construction of Smart Places—digitally mediated physical spaces designed to encourage particular social interactions.*

The following sections discuss simple precepts, which can guide the development of Discreet Computing systems for creative businesses.

PRECEPTS FOR DISCREET COMPUTING

Discreet computing is an attempt to redress the balance between social knowledge-sharing, and the use of technology to link people together. At its heart, the idea is to use technology for what it is good for (the creation of documents and their sharing, and the provision of communication channels between people), while as far as is possible, removing the technology itself from the centre of attention. These desires have implications for the use of communication systems, and the way that physical computing devices are deployed in a working environment.

Some systems will never be discreet—document production tools and finance systems will always, rightly, demand focussed attention from their users, and display relatively complex interfaces. Databases of pure facts and figures will often require tailored search engines.

Discreet computing is about linking people together so that they can use the 'dry facts' stored in such systems more effectively in their social networks, to collaborate and generate better ideas for their clients. Keep the dry facts accurate and up-to-date, but attempt to make all other systems as lightweight and discreet as possible, and use automated systems to surface valuable information when it has value, *in the moment*, without the need for users to engage excessively with technology.

Inevitably, the adoption of a discreet computing mindset requires process changes throughout an organisation. People may initially be disoriented and confused by diminished interaction with the technology which has long defined what they conceive of as 'work'. Do not underestimate these process needs.

BUILD SMART PLACES

Traditional working environments concentrate digital access into clusters of desktop computers. The adoption of discreet computing offers the opportunity to concentrate on needs, rather than systems. Rather than providing a space occupied by people and systems, build Smart Places (mediated spaces with a social function). Work to understand the needs of your communities, then work not to 'design the space', but rather 'design for the interactions you want to take place there' [2].

KNOW THYSELF. KNOW THY NEIGHBOUR (AND SPY ON THEM)

The development of the Internet has fuelled research into the deep structure of networks—both social and digital. Interaction via the Internet is highly amenable to study, for the simple reason that unlike real-world conversation and communication, digital systems which mediate communication are easily instrumented to provide data for analysis [3]. An emergent generation of *social network analysis* tools is being developed to turn this data into valuable social network maps—to identify the deep structure of social connectivity within diverse communities.

Use these social network mapping tools to analyse email and Instant Messaging logs to see who is actually talking with whom. Monitor usage over time to see if and how adoption of radical technologies actually changes the social organisation of your business—real-world social networks will cast shadows into the digital realm. With the informed consent of employees and their correspondents, an organisation can monitor communication channels such as email, mailing lists and instant messaging channels to identify tacit communities of practice and to *harvest* valuable conversations [5]. Use this information to power automated tools which tactically feed this stored knowledge back to people when it is relevant, without them having to become deeply engrossed in software interfaces.

UNDERSTAND ATTENTION (AND ACCOMMODATE ITS NEEDS)

Investigate the contexts in which communication is relevant *and* the attentional context in which it is received, understood and acted on. For example: pitch help and new business requests require a different attentional commitment than a meeting proposal, and may need to persist for longer in the peripheral attentional field of their recipients to accrue useful responses. Explore the attentional affordances of differing interfaces and technologies. *Value the glance* (see the next section).

- Consider technologies such as news tickers for information which is important, but which doesn't require an immediate response, rather than feeding everything through emailed alerts.
- Exploit the 'presence' information available in Instant Messaging so that people know when their correspondents are actually available and willing to talk, rather than blindly firing emails off into the ether with no knowledge of the attentional context of the intended recipient. This is not only more polite, it is more likely to open communication channels when correspondents are receptive and willing to share their valuable knowledge and attention.
- Develop systems to be presentation-neutral, and exploit the diversity of acquisition and delivery mechanisms which people *already perceive* as having a social function—such as Instant Messaging and email.
- Consider the *whole* digitally-mediated environment as available for communications—exploit the attentional affordances of news tickers, screen-savers, start-up screens, ring-tones as well as 'traditional' digital communication channels.

VALUE THE GLANCE

Make important information amenable to a glance [2], rather than mouse-clicks and focused attention. This is the basis for what I call In Your Face (IYF) systems, or *glanceware* [6]. There is little point having valuable knowledge tucked away in a database if the only way into it involves many mouse-clicks and a shift of modalities away from where people's attention is already focused.

Move from the metaphor of desktop and overlaid application windows, where possible, to something like the 'control surfaces' used in music production studios, where everything important is visible immediately at the top level of the interface. Think sticky notes.

Remove the necessity for people to burrow through layers of applications and confusingly differing interfaces to get at information—make access to surrounding social and business contexts *lean-back*, rather than *lean-forward*.

Build channels into systems which are always *in front of users*, and which facilitate communication—in creative businesses, value comes from injecting knowledge tactically into social interactions. Get that knowledge out to people in a form where it can be quickly shared and enable extant communities of practice, be they project teams or other workgroups, quickly and easily.

LIBERATE THROUGH PERVASIVENESS

Liberate your people from the necessity to be within a network-cable's reach of a wall socket. Make your networks pervasive, wireless, easy to access.

Form partnerships with interesting outside businesses and spaces to provide wireless 'hotspots' where your people can work and interact with others. Encourage your clients to come and work in your space, or to come and share space you have networked.

ENCOURAGE INTIMICY

Adopt reliable, always-on portable devices like Blackberry. Such devices allow important systems to receive continuous *partial* attention, rather than sucking attention wholesale into an on-screen environment.

KEEP A LIGHT TOUCH – NURTURE SELF-ORGANISATION

Desktop systems are still valuable—documents still need to be produced and shared. But make your systems compact, light and cheap—easy for people to move around, or to get rid of entirely if they want clear space to work. This might imply a move to laptop computers. Consider also the benefits of extremely cheap, ultra-small desktop devices, which can be quickly depreciated and replaced, as needs change. In all ways, make it easy for people to self-organise the way they use space and tools as their needs change, even within the working day.

THINK OUTSIDE THE (BEIGE) BOX

Many systems and tools other than computers command unnecessary attention—after all, the attention commanded by filing cabinets, mail trays and typing pools was an important driver for the initial adoption of desktop computing! The paperless office will probably never happen (paper is a very effective technology with five thousand years of constant development behind it [7]), but consider the mounds of video and audio tapes which clutter up creative offices, taking time and effort to move, sort and archive. Moving the content of these media online, and providing access via discreet computing devices is another way to help people use technology for what it is good for—storage and retrieval of 'dry facts' or digitised media, and research—while freeing up attention elsewhere for the creative work which really matters.

APPLYING THE IDEAS

Discreet computing is a matter of philosophy and usage, rather than new technology. Many of the ideas we've covered involve repurposing of existing technology, or its elimination altogether, rather than heavy systems work.

Work outwards from the needs of your teams and communities of practice—look at their needs, then find ways to provide them through Smart Places and Discreet Computing tools. Don't conflate the belief that all your people are valuable with the assumption that they all need the same tools, in the same way, all the time: ensure that the tools you use to answer their needs are as appropriate and discreet as possible for the needs of a particular group, in the moment.

The major areas for development and exploration are in social network analysis, and backend agents for the consensual surveillance of communications channels. There is much research activity in these areas, both commercially and academically, but few commercial products.

PHILOSOPHICAL FOOTNOTE

Discreet computing is a way of looking at and reflecting on how we *experience*—and engage with—tools. The belief that *attention* is at the core of an impasse in our use of digital tools comes from this phenomenological approach [8].

The way out of the impasse proposed here can be traced back to important two theories from cognitive science and learning theory.

The first regards ‘embodied intelligence’—the idea that we build our world to surround ourselves with *scaffolding* which in turn amplifies our innate abilities for pattern-match and symbol processing. “Our brains make the world smart so that we can be dumb in peace.” [4].

The second is that true collaboration and learning depend on social interaction. Conventions emerge through communities of use. They emerge when expectations and patterns of use are visible to all. In communities of computer mediated communication, conventions spread through shared use and legitimate peripheral participation, a concept with its roots in studies of learning made by Lev Vygotsky [9], and later applied to work studies [10]. Discreet Computing provides multiple channels and opportunities for legitimate peripheral participation through Smart Spaces—mediated social environments (real, virtual and hybrid) where information is always ‘within reach’, wherever people are, and whatever the task is at hand.

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