Tunneling Ahead

LIVING IN THE INFORMATION AGE can occasionally feel like being driven by someone with tunnel vision. This unfortunate disability cuts off the peripheral visual field, allowing sufferers to see where they want to go, but little besides. For drivers, this full attention to the straight ahead may seem impressively direct. For passengers who can see what the driver does not it makes for a worrisome journey. The car may skirt the mirrors of passing cars, threaten the hands and ankles of nearby cyclists, roll close to the toes of pedestrians, occasionally scrape walls and gateposts, and once in a while take a serious sideswipe that jeopardizes the journey.

Similarly, some of the people driving us all hard into the future on the back of new technologies appear to assume that if we all focus hard enough on information, then we will get where we want to go most directly. This central focus inevitably pushes aside all the fuzzy stuff that lies around the edges—context, background, history, common knowledge, social resources. But this stuff around the edges is not as irrelevant as it may seem. It provides valuable balance and perspective. It holds alternatives,

offers breadth of vision, and indicates choices. It helps clarify purpose and support meaning. Indeed, ultimately it is only with the help of what lies beyond it that any sense can be made of the information that absorbs so much attention.

Think of the way people interact. Talk may deliver information—something that can be recorded, transcribed, digitized, and shipped in packets. But as you talk, listeners set what you say in a much larger context. Your appearance, your age, your accent, your background, and the setting all contribute to what they understand. Few people are like Sherlock Holmes, able to spot an ex–Indian Army soldier now working as a billiard marker across a street. But we are all remarkably good at picking up clues and cues that underwrite or undermine what a speaker says. Con artists have to work for their living.

Except, perhaps, in the digital world. It is no surprise, really, that cyberspace has become famous for "identity experiments" and con games.[1] The world of information is often so thin, the cues and clues so few, that in many cases it's easy to pose, even as an ex–Indian Army soldier now working as a billiard marker, and get away with it. In the tight restrictions of the information channel, without the corroboration that broader context offers (or refuses), the powerful detective skills that everyone relies on have little room to work.[2]

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TUNNEL DESIGN

Ignoring the clues that lie beyond information doesn't only lead to a narrow world of deception. It leads to a world of what we think of as *tunnel design*—a kind of purblind design of which, in the end, we are all victims. In this world we are often expected to live on a strict information-only diet. Indeed, it's a world that usually

addresses worries about information by simply offering more. Yet when only information is on offer, more often means less.

Tunnel design, we suspect, produces technologies that, in Edward Tenner's phrase, "bite back."[3] These are technologies that create as many problems as they solve. Many of the unintended consequences of design that Tenner describes and that make new technologies so frustrating arise from neglecting resources that lie outside the tight focus of information.

If badly designed technologies bite back, the good ones often fight back. Well-designed technologies, that is, refuse to retreat meekly in the face of tunnel design. Futurology is littered with the obituaries of tools that nonetheless continue a robust and healthy life. One of our own favorite examples is the hinge. This seems to be written out of every futuristic movie in favor of the sliding door; yet, it not only hangs on but is vital to many laptops and cell phones.[4] Even the typewriter still finds a place in many "infomated" offices.[5] These are trivial examples. But obituaries are now regularly written not just for tools, but for well-established practices, organizations, and institutions, not all of which seem to be fading away.

The dogged endurance of those that refuse to fade tends to produce opposing responses. Those with tunnel vision condemn the foolishness of humanity for clinging to the past. Those exasperated by tunnel design tend to cheer the downfall of new technology as if it were never likely to come to any good. There is, we believe, a better, more productive approach. It is for the new to learn from the old. Tools fight back when they offer people worthwhile resources that may be lost if they are swept away. So rather than condemning humanity as foolish, primitive, or stubborn for sticking with the old and rejecting the new, it seems better to stop and ask why.

The answer often turns out to be that the new alternatives have underestimated their targets. Paradoxically, tunnel design often takes aim at the surface of life. There it undoubtedly scores lots of worthwhile hits. But such successes can make designers blind to the difficulty of more serious challenges—primarily, to the resourcefulness that helps embed certain ways of doing things deep in our lives. Generations of confident videophones, conferencing tools, and technologies for tele-presence are still far from capturing the essence of a firm handshake or a straight look in the eye.

To say this is not to plead for a return to the buggy cart, the steam engine, or the vinyl record. It is to plead for attention—attention to stubbornness, to what will not budge, to the things that people fight for. So it's to plead for design that takes into account resources that people care about. Such design, we are confident, produces tools that people care about—a kind of tool that seems, despite modern inventiveness, in remarkably short supply. (Take a quick look over the computer applications you have bought, borrowed, or downloaded over the past five years and see how many you would actually fight for.)

Issues about the breadth or narrowness of design are not, we should stress, issues for designers alone. Increasingly, we all live in a heavily designed world and need to understand both the strengths and the limitations of the designs offered to us. In particular, we all need to be able to deal with the hype that accompanies new technological designs. In the digital world, moreover, many of the distinctions between designers and users are becoming blurred. We are all, to some extent, designers now. Many questions about design are thus becoming questions for us all. It is important, then, to understand our own limitations as designers, too, and to know where to look for resources.

FIGHT TO THE FINISH

So where might the resources that we believe are overlooked lie? Despite our metaphor of tunnel vision, our sense of the neglected periphery is not limited to the visual periphery of physical objects.[6] It also embraces what we think of as the *social periphery*, the communities, organizations, and institutions that frame human activities. These, though vital to how we all live and work, are too often missing from the design stylebooks of the information age. Or, if they are included, they come as targets, not resources for design. It is to help draw attention to these hard-to-see (and hard-to-describe) resources that we gave our book the title it has. Attending too closely to information overlooks the social context that helps people understand what that information might mean and why it matters.

Well-honed resources for living tend to fall out of sight, lost to the immediate demands of daily life. New technologies, by contrast, draw and deserve a lot of attention. Consequently, it's easy to overlook the resources that lie beyond the immediacy of the information tunnel, even when they are quite substantial.

For example, a colleague at the University of California, Berkeley, recently sang the praises of the digital world to us. He can now, he told us, through the university's digital library, get direct access to information. He felt, he said, in touch with information as never before.

His enthusiasm was justifiable. New technologies have changed the life of researchers tremendously. Nonetheless, his enthusiasm had screened out an enormous array of people, organizations, and institutions involved in this "direct" touch. The university, the library, publishers, editors, referees, authors, the computer and infrastructure designers, the cataloguers and

library collections managers, right down to the students making their way through college by shelving and unshelving books, copying and scanning, and delivering files across the campus had no place in his story. When they do their job well, they do it more or less invisibly. But without them, there would have been no story.

Similarly, those who talk about having direct, unmediated access to the news sometimes sound equally oblivious to how news is made. They sound as if to find the "real" news on Russia, for example, they would expect to pick up the phone and get Boris Yeltsin on the other end of the line. But it requires a profoundly naïve belief in "disintermediation" (see chapter 1) to assume that all the links that fall between Yeltsin and the news are somehow interference in the information channel. Rather, it is in these steps—from sources to reporters to editors and news organizations—that news is made. Without them, again, there would be no story. Nonetheless, when information takes center stage and lights dim on the periphery, it's easy to forget these necessary intermediaries. But while these may be invisible, they are not inconsequential.

Occasionally, the naïve neglect of the world beyond information reminds us of an old Popeye cartoon. In this, if we remember right, Popeye finds Sweet Pea, the baby, crawling along the ledge outside the bedroom, oblivious to the danger below. While Popeye frantically slips, slides, and dangles way above the street trying to reach the baby, Sweet Pea crawls giggling to the end of the ledge and off. But one of those swinging girders that obligingly come by in the cartoon world leads her on undisturbed. Popeye meanwhile, much disturbed, falls down the stairs, trips on the sidewalk, and collides with lampposts trying to keep up. From the edge of the swinging girder,

Sweet Pea next crawls onto the roof of a conveniently passing truck. The truck nearly runs Popeye over. And so the chase goes on until Sweet Pea manages to end happily back in the bedroom, all the while oblivious to the extraordinary resources that have provided support and protection. In Sweet Pea's mind, Sweet Pea did it all. Popeye, meanwhile, has met the sharp end of each of these resources.

Some digital champions can appear a little like Sweet Pea, oblivious to the resources of the world that support them. Others, more worryingly, are actively hostile. They see society's resources as constraints on information and yearn to be free of them. Material objects appear as the unwanted antithesis to bits, communities and organizations as enemies to individualism, institutions as "second wave."

It's not hard to understand this antagonism. For the most part people notice these supports primarily when something goes wrong. When everything works well, we are all a little like Sweet Pea, most ignorant of what makes us most secure. When things go wrong, we are more like Popeye, feeling that the stairs betrayed us, the lamppost attacked us, and that the world would be a better place without such things.

We hope that in the course of this book we can steer a path between blindness and bruises. We want to draw attention to the resources people use in the belief that what are resources for people are, by extension, resources for the design of useful tools. Tools that ignore these resources will be, in great part, tools that are at best ignored, at worst a burden on those who have to use them.

To make this case, we look at plans, prognostications, and designs that have been much applauded in theory yet significantly ignored in practice. We include prognostications about, for example, the world of information, digital agents, the home

office, the paperless society, the virtual firm, and the digital university. From here we try to explain why so many confident predictions remain just that, predictions. Too often, we conclude, the light at the end of an information tunnel is merely the gleam in a visionary's eye. The way forward is paradoxically to look not ahead, but to look around.

CONVERSATIONS

The essays that follow attempt to address the social context of information from a variety of different perspectives. They have grown out of long-running conversations that the two of us have conducted in public and in private over the last dozen years or so—conversations in which we found that, though the topic shifted, the way in which we addressed it had common threads.

These threads allow us to talk from a single standpoint about the limits of infopunditry (chapter 1), the challenges of software agents (chapter 2), the social character of work and learning—and the limits of management theory (chapters 3–5), resources for innovation (chapter 6), unnoticed aspects of the document and their implications for design more generally (chapter 7), and the future of institutions, in particular the university (chapter 8). Despite what we see as the common threads, each chapter, we hope, can be read on its own.

These essays, like the conversations they reflect, try to avoid the blinkered euphoria of the infoenthusiast. Though we are enthusiasts for technologies, we focus predominantly elsewhere—on society, practice, and institutions. We look this way because we know that while information and its technologies cannot solve all society's problems, society and social resources can solve many of

the problems of both information and technology. But it is society and social resources to which many designs are blinkered, if not blind.

Though we point to social resources for solutions, this is, we must admit, more a book of questions than answers. This may not seem a very constructive approach. We are, after all, writing in a genre where people often seem to identify the major problems of the world and then announce that the solution is running on the machine of a colleague in the office next door. We are enormously proud to be associated with our colleagues at the Xerox Palo Alto Research Center (PARC) and of the work they do. And we do point to their work quite often. In general, however, we have tried to avoid short-circuiting the loop between problem and solution. Our aim, though associated as we are with Xerox we are a little hesitant to say it, has been to keep the conversation going and even change its direction a little.