

**Interface culture**  
**How new technology transforms the way**  
**we create and communicate**  
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The world of technology belongs to the world of culture. Those two worlds are united. We have a habit of imagining them as separate, the two great tributaries rolling steadily to the sea of modernity and dividing everyone in their path into two camps.

The world technoculture appears on every other page of *Wired* magazine.

The creative mind and the technical mind have long cohabited.

Internet could be considered as “the greatest thing since the invention of fire”.

Technology used to advance slower.

Newspapers had a couple of hundred years to innovate; even film ruled the roost for thirty years before the rapid-fire succession of radio then television.

McLuhan's *Understanding Media* is a book full of radical pronouncements. "Today it is the instant speed of electric information (...) Electric speed is synonymous with lights and with the understanding of causes".

McLuhan may have been the most profoundly apolitical thinker in the second half of the twentieth century, but his ruminations on the consciousness-raising powers of technological speed sound uncannily like Karl Marx's – particularly the later Marx of the second and third volumes of *Capital*. "An anarchy of permanent revolution".

McLuhan saw electric speed as synonymous with the “understanding of causes”.

There are no artists working in the interface medium who are not, in one way or another, engineers as well.

Their medium reinvents itself too quickly for false oppositions.

Like the illuminations of McLuhan’s electric speed, the commingling of traditional culture and its digital descendants should be seen as a cause of celebration, and not outrage.

The Desktop begins with the discovery of the office metaphor and then examines the difficulties of representing social life within that limited frame. “Windows” looks at the way multiple viewpoints changes not only our psychological profiles but also our ethical and legal expectations about the proper use of information.

Aristotle defined metaphor as the act of “giving the thing a name that belongs to something else”.

# Bitmapping: an introduction

Written by a high-ranking army scientist named Vannevar Bush, the essay “As We May Think” described a theoretical information processor called the Memex that enabled a user to “thread through” massive repositories of data, almost like a modern-day Web surfer.

Doug Engelbart can be called as the father of the modern interface.

# Bitmapping: an introduction

In 1968 Doug Engelbart unleashed on the world the bitmapped datasphere.

It was clear from Engelbart's first breathtaking demonstration in 1968 that windows would revolutionize the way we imagine information.

# Bitmapping: an introduction

Interface: software that shapes the interaction between user and computer. The interface serves as a kind of translator, mediating between the two parties, making one sensible to the other.

The Interface serves as a kind of translator mediating between the two parties, making one sensible to the other. In other words, the relationship governed by the interface is a semantic one, characterized by meaning and expression rather than a physical force. Digital computers are “literacy machines” as hypertext guru Ted Nelson calls them. They work with sign and symbols, although this language.

# Bitmapping: an introduction

Graphical user interface (GUI), first developed at Xerox's Palo Alto Research Center during the seventies and subsequently popularized by the Apple Macintosh.

The widespread adoption of the GUI has dramatically changed the way in which humans and computers interact, and has greatly expanded computer literacy among people.

The first generation of graphic interfaces (like the Mac or Windows) seem to incommensurate with our notions of "high art" because the tasks they represent on screen are relatively simple ones.

# Bitmapping: an introduction

Infosphere continues its exponential growth, the metaphors used to describe it will also grow both scale and complexity.

We will need a new language to describe the changes that technology brings in our lifestyle.

Some of this language will raise up *sui generis* out of the new technologies, but most of it will borrow extensively from preexisting traditions: art and architecture, the cinema and the novel.

The computer interface could be considered the most dynamic and innovative region of the modern world.

## The principle of direct manipulation

Unless the user had some control over those images, the illusion will be remote.

Instead of telling the computer to execute a particular task –”open this file”- users appeared to do it themselves.

McLuhan himself never tired of describing the electric technologies of the twentieth century as extensions of our central nervous system

# Bitmapping: an introduction

For the first time, a machine was imagined not as an attachment to our bodies, but as an environment, a space to be explored. It was more like a landscape than a machine, a “city of bits”, as MIT’s William Mitchell called it in his 1995 book.

The idiom begins and ends with information space. And that’s only a few decades after Engelbart’s original demo /imagine how far the metaphor will have traveled by the end of the next century. We are all bitmappers now.

## Bitmapping: an introduction

The Metashows, the shows interested not in telling stories but in riffing on other media, have experienced a genuine flowering in recent years.

Television storytelling -as a medium- has made only modest advances over the past twenty years.

The infosphere is now a part of our “real life”.

We are fixated with the image not because we have lost faith in reality, but because images now have an enormous impact on reality to the extent that the older image-reality opposition doesn't really work anymore.

New technologies invariably possess the aura of unreality.

## Bitmapping: an introduction

The Shadow and the Jack Benny Show weren't really great radio programs –they were just bad television shows, TV-style narratives stripped down to fit the limited dimensions of radio. They were a message waiting for the medium to come.

Metaforms don't fare well in the analog world of television.

# Bitmapping: an introduction

As more and more of the culture translates itself into the digital language of zeros and ones, these filters will become enormously important, even as their cultural roles become increasingly diverse, embracing entertainment, politics, journalism, educations, and more.

The interface is a way of mapping that strange new territory, a way for us to get our bearings in a bewildering environment.

## Bitmapping: an introduction

Decades ago, Engelbart and a few other visionaries recognized that the information implosion could be both destructive and liberating –and without a metaphor to guide us through that information-space, we´d run the risk of losing ourselves in the surplus information.

Cultural forms are not always reducible to the physical medium that contains them.

Cultural change, on the other hand, receives a powerful boost from the amalgamation and anastomosis of different traditions.

# Bitmapping: an introduction

The digital revolution will transform our experience of the world, just the Industrial Revolution transformed the experience of the nineteenth-century Westerners.

In the early sixties McLuhan famously remarked that living with electric and mechanical technologies at the same time was “the peculiar drama of the twentieth century”. The great drama of the next few decades will unfold under the crossed stars of the analog and the digital.

# The desktop

The information-space on the monitor embodies –  
”makes imaginable”.

Cathedrals, more than mere buildings, they implied a way of looking at the world, a sacred order; a sense of proportion.

Shopping malls break all the rules: their exteriors are bleak, unfinished, designed to confuse. And in fact, it has been designed to confuse: there’s good money to be made from disorientation.

A financially successful shopping environment is one that confuses you, that makes you lose your bearings, that keeps you walking –since more walking necessarily entails more exposure to merchandise that you might be suddenly compelled to buy.

In this high velocity times, anything that disorients sells product.

All works of architecture imply a worldview, which means that all architecture is in some deeper sense political.

Wittgenstein wrote: “is to imagine a way of life” The same is true of buildings, parks, cities –anything conjured up by the human imagination.

The bitmapping revolution had introduced the concept of dataspace.

You could build anything you wanted in the new information space –but it had to be simple and easy to represent-.

*Like most of Silicon Valley sagas, it begins with a plucky band of outcast and dreamers, and ends with Bill gates quering the planet.*

## The desktop

It was early 1972 at Xerox's high and computer science lab in Palo Alto (also known as PARC) were struggling with the legacy of Doug Engelbart's windows. All of the anecdotal evidence suggests that it was an enormously creative intellectually challenging place, and it summoned up an immense number of high-tech innovations in less than a decade. The modern idiom of computing was born there. But it produced a moneymaking product in all that time with one possible exception.

## The desktop

A number of Xerox PARC scientist were veterans of the Stanford Research Institute; they'd imported a selection of Engelbart's ideas about bitmapping, mice and windows to Xerox.

Engelbart and Sutherland had endowed the digital computer with space; Kay's overlapping windows gave it depth. You could move in and out of the landscape on the screen, pull things toward you or push them farther away. The bitmapping revolution had given us a visual language for information, but Kay's (Alan) stacks of paper suggested a more 3 dimensional approach, a screen space you could enter into.

# The desktop

The whole idea of imagining a computer as a environment, a virtual world, comes out of this seemingly modest innovation, although it would take many years for that legacy to become visible.

The metaphors would make the user experience more intuitive, and the playful, lively graphic metaphors made the idea of using a computer much less intimidating.

Xerox PARC team hammered out the first genuine desktop interface, as part of an experimental operating system called Smalltalk. Xerox never managed to do anything with Smalltalk.

## The desktop

Steve Jobs, one of the founders of Apple Computer, was in the market for the Next Big Thing, the technological advance that would revolutionize computing the way the original Apple II had several years before. Within 2 years, Apple has a desktop interface running on its Lisa machine, an expensive, underpowered product that never found a market. The following year; however, Apple released the Macintosh with a inventive, mesmerizing desktop metaphor, one that introduced almost every modern interface element to the popular imagination: menus, icons, folders, trash cans.

The Macintosh was far easier to use than any other computer on the market, but it also had a sense of style.

Alan Kay had realized that computer was a medium. If the personal computer (was) a truly new medium then the very use of it would actually change the thought patterns of the entire generation. It was a lesson that he had learned from McLuhan's *Understanding Media*.

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## The desktop

PCs, with their arcade codes and hideous green-on-black monitors belonged to the suits, to Organization Man. The Mac's playful interface spoke to a different demographic: jazzier, creative types, new thinkers and iconoclasts. Buying a Mac was an expression of individual identity.

The rise of Microsoft Windows confirmed the superiority of the desktop metaphor.

In the digital world, where the need for compatibility propels consumers toward a single industry standard, this sort of power rippled out quickly into other fields.

Rooting for the Mac was no longer just a lifestyle issue; it was a way of standing up for fair competition and free markets. The stakes were political, not cultural –a battle against consolidated power rather than an act of personal expression-.

In 1995 the Justice Department began an investigation into Microsoft newly announced online service, the Microsoft Network (MSN) for alleged antitrust violations.

## The desktop

Personal Computer asked a genuinely thoughtful essay from late 1984, “or are the icons and mouse control –which many of the new systems ignore- necessary elements of the true desktop environment?”

Developed under the supervision of Melinda French (now Mrs. Gates) and tellingly code-named Utopia, Bob emerged in the spring of 1995 with a stunning amount of media fanfare particularly given the mediocre sales that followed it’s launch.

Interfaces such as Bob give us the comforting illusion of domestic life.

The other problem with the domesticity of Microsoft's Bob is that imagined space is a profoundly antisocial one. It conceptualizes the infosphere as a private home.

# The desktop

Metaphors create relationships between things that are not directly equivalent. Metaphors based on complete identity are not metaphors at all. In traditional interface design, a computer window bears a kind of superficial resemblance to a real-world window.

The original Macintosh design, your computer desktop functioned like a real-world desktop, just like your file directories functioned like real world folders.

Interfaces give us the comforting illusion of domestic life.

The digital computer turns out to be the first major technology of the twentieth century that brings strangers closer together.

## The desktop

The automobile created the insulated cloisters of suburbia; the telephone and the television went us firmly implanted in our domestic spaces; even when the public life at the cinema unfolds under a vow of silence.

Mediated conversations are not by definition shallow.

Future interfaces may allow for more physical, more gestural expressiveness.

We´re used to communicate with our friends and family by sending them snapshots of sketches or tape mixes, but in the future we will reach out those around us by sharing virtual environments.

Spatial metaphors of the original desktop will expand into more vividly realized environments over the next few years environment.

The first spatial metaphors to find their way into computer interface were mistaken for video games and it took years for the DOS snobs and command-line devotees to accept the computer desktop as anything other than a child's toy.

# Windows

The history of Internet now neatly divides into two epochs: pre-windows and post windows. Windows make our computers easy to use.

Spatial information is easier to navigate than textual information, and windows are a tool for just seeing that space.

The knowledge becomes second nature to more users. Spatial memory works only if the objects you're trying to keep back of remain anchored in one place.

Windows are more fluid, more portable. They're designed to be malleable.

You're organizing information textually in terms of categories that you've defined yourself.

What Doug Engelbart and the folks at Xerox PARC realized was that you could take these arcane command-driven modes and replace them with windows. They were a way of representing modes- and, more important, a way of switching back and forth between modes.

Now is difficult to imagine a digital world without Windows.

When the conventions are so familiar, so second nature, that they become transparent to us.

The onscreen space has grown more layered and multiplicitous, and all of the interface innovations, the window has played the most important role in making this possible.

We no longer think of virtual windows as analogs of the real-world version. They're a species unto themselves.

Modern interfaces respond to a request for another perspective by calling up another window, another view out onto the data space, separate but equal.

Design a tool to solve one problem, and soon enough you'll find another problem that the tool can solve.

Jaron Lanier's virtual-reality goggles began a quest for a visual programming language, but soon morphed into an entertainment device. The Web itself is a kind of large-scale exaptation. Originally designed as a local filing system for academic research it became a mass medium almost overnight conveying news, soap operas, diary entries, soft-core porn, and almost anything else you can imagine to an audience of information worldwide.

Intellectual property law, as it stands now, doesn't have a language to describe the new realities of digital information.

Intellectual property laws don't know how to deal with windows with metaforms that hover in that strange zone between medium and message.

A browser, of course, is a Web-friendly derivation of the original window.

# Windows

The browser is a metaform, a mediator, a filter.

Reporters and op-ed writers and television pundits have always offered a window on the world, a distinct point of view on the day's events.

The window made it possible, to think of journalism as a filtering process, a view that looks out onto other views.

The hyperlink let us stitch that world together into a more coherent shape.

The desktop helped millions of users to acclimate to the idea of information-space. There are always threshold points and variations that separate the metaphor from the thing itself. Sometimes the gap is so wide that the translation obscures more than it reveals.

Jeff Spicoli says that Web surfing, after all, is a derivation of channel surfing the term thrust upon the world by the rise of remote controls and cable panoply in the eighties. But web surfing and channel surfing are genuinely different pursuits.

A channel surfer hops back and forth between different channels because he is bored. A web surfer clicks on a link because he is interested.

Hypertext suggests a whole new grammar of possibilities, a new way of writing and telling stories. A link is a way of drawing connections between things, a way of forging semantic relationships. The link plays a conjunctive rule, binding together disparate ideas in digital prose.

The WWW, where this imaginative crisis is most sorely felt, it is the link that finally supplies that sense of coherence.

The Memex “consist of a desk, and while it can presumably be operated from a distance, it is primarily the piece of furniture at which (the user) works. On the top are slanting translucent screens, on which material can be projected for convenient reading. There is a keyboard, and sets of buttons and levers. Otherwise it looks like and ordinary desk”.

The Memex would not see the world as a librarian does, as an endless series of items to be filled away on the proper shelf. It would see the world the way a poet does: a world teeming with associations, minglings, continuities.

The Web surfer depends on the charity of others for this associative links; the trailblazer rolls his own.

You can create a master list of your favorite resources, but there is no way to describe the relationship between them, the links of association that make that personal web intelligible to you.

The best way to understand a technology is to approach it with no expectations, no preconceived ideas.

The link was going to engender a whole new way of telling stories. It turned out to be an element of style.

Pen and paper feel profoundly different to me now – they have the air of an inferior technology about them, the sort of contraption well suited for jotting down a phone number, but not much beyond that. I am a typer, not a writer.

The software has grown more seductive, more visually appealing over that period.

The word processor changes how we write.

The computer had not only made it easier for me to write, it had also changed the very substance of what I was writing, and in that sense, I suspect it had an enormous effect on my thinking as well.

New technologies are always misunderstood at their birth.

Edison mistakenly assumed that the phonograph would be primarily a personal recording medium.

The history of technological innovation is a story of happy accidents and brilliant mistakes.

Being digital means being able to reinvent yourself at the click of a mouse.

IBM president Thomas Watson Jr's legendary announcement in 1943 that the ultimate worldwide market for computers would be around five machines.

Computers began as number crunchers, but they spent most of their adolescence under the tyranny of text –all those inscrutable commands and instructions sets emblazoned on green phosphor monitors and etched into punch cards.

Progress happened in a nonlinear, staggered fashion, with steady, incremental growth punctuated by sudden leaps forward.

The most significant change would be this: a semantic file system would give the computer much more control over the organization of your data. You'd define the broad categories, but the machine would make the hard decisions of what goes where, including –inevitability- judgment calls that are better left to humans.

# Agents

The Macintosh had ushered in the entire rhetoric of visual metaphors: the desktop, the trash can, the folder, the mouse.

Part of McLuhan's point in *Understanding Media* was that new technologies forms –the television, the radio, the book- transform not only the balance of power between our senses but also our experience of other media. Radio changed the form of the news story as much as it altered the film media in the talkies, McLuhan argued. “TV causes drastic changes to radio programming, and in the form of the film of documentary novel.

There are 3 kind of agents: personal, traveling and social.

The modern graphic interface is defined by “direct manipulation”.

The illusion of the graphic interface is that you seem to be doing the work yourself.

The original graphic-interface revolution was about empowering the user.

The idea of intelligent agents is wrong and evil, Lanier writes. This is an issue of real consequence to the term future of culture and society.

New technologies rarely speak with a single voice.

The traveling agent imagined here is probably the most clearly realized model of the agent as representative idea: the agent represents you in the dealings with other agents, shifting through an entire repertoire of personae over the course of a day: a clothes buyer one moment, a personal secretary the next.

The lesson of most cyborg literature is that the commingling of human and machine in the life of libido is inevitable, and inevitably destructive.

The real breakthrough, we're told, will come when our agents start anticipating our needs.

As in the world of espionage, the central problem with intelligent agents is that it's not always clear who they're working for.

“Push media” in the most basic sense, it is information that comes to you, as opposed to information that you go get yourself (traditional Web browsing is accordingly thought of “pull media”. Think junk mail.

You could build an entire personality profile just by shuffling through a week’s worth of my mail.

Just because it’s customized junk mail, it doesn’t mean it’s not junk.

The pushers will strain mightily to transform their ads into information services.

We need better road maps for information-space, not better home delivery.

What we really need are better ways to pull.

Intelligent agents are not just in the business of anticipating.

# Agents

An agent that could evaluate your tastes in movies or wine or even people, an agent that could built a nuanced model of your aesthetic or interpersonal sensibility...

When the agent starts coming up with ideas of its own, based on its appraisal of your personal tastes...

The trouble begins when our agents start meddling with our subjective appraisals of the world, when they start telling us what we like and don't like, like an astrologer or a focus group.

But how are our agents going to get that smart? Lanier thinks they won't, not ever. The humans will just get more stupid, in a kind of a regressive coevolution.

The more information in the data base, the more feedback from the users, the smarter the agent gets. The bottom-up organization lets the computer perceive relationships that might otherwise fly below the radar of human perception. The feedback loop lets it learn.

The mainstream music world is a conservative system, in the most basic sense of the word: it reinforces the existing state of affairs. Record executives, as a rule, prefer successful bands to less successful ones.

Subcultures, on the other hand, are much receptive to innovation.

Subcultures invariably feeds into the dominant culture, and it is a steady trickle of innovation that keep the mainstream lively.

Thomas Alva himself, the man may have powered up the first electricity grid and sung “Mary had a little lamb” into the first phonograph...

As “always, “the street finds new uses for things”.

Bush speculations on the associative powers of the Memex anticipated much of modern PC's storage and retrieval capabilities, as well as the hyperlinks of the WWW.

The power of manipulation is the sine qua non of the modern computer, its core competency. And Vannevar Bush missed it altogether.

Bush couldn't see the PC's defining characteristic, the malleability of digital information.

The tyranny of image over text, the limitations of the desktop metaphor, the potential chaos of intelligent agents.

The rise of the Mac and Windows introduced a mass audience to desktop and icons, while the Web popularity endowed browsers and hypertext with a certain subcultural sexiness.

The most profound change ushered in by the digital revolution will not involve bells and whistles or new programming tricks. It will not come in the form of a 3-D Web browser or voice recognition or artificial intelligence.

Information-space is the great symbolic accomplishment of our era.

As our culture is rapidly becoming electronic are less and less what we were, a society of isolated individuals. We are hurrying to get on-line, and the natural corollary to this is that the idea of individuality must come under siege... In time we will all live, at least partially, inside a kind network consciousness... Our spells of unbroken subjective immersion will become rarer, and may even vanish altogether.

The cinema, for instance, has a dual tradition of psychological depth and social extroversion.

Nothing will propel the interface toward the status of art more quickly than the development of a functional interface subculture –small pockets of designers working in opposition to the mainstream.

But the real revolution unleashed by HTML, may well be the democratization of Interface design.

Subcultures won't go very far, of course, if their more enigmatic spaces can't eventually be conquered, made sense of.

Apple gets a great deal of credit for translating the XEROX Parc desktop metaphor into a working product.

You can have the most powerful visual metaphor in the world, but if it doesn't look the same from application to application. If the user must relearn the interface's language with each new project, then the power of that original metaphor is greatly compromised.

Never make the user learn how to use the same thing twice.

One easy way to built a consistent user interface is to follow the codes and conventions of the real world.

Interface, finally is a synthetic form. Fake landscape that passes for the real thing, and it is a form that works in the interest of synthesis, bringing disparate elements together into a cohesive whole.

Experiencing godhead usually involves some kind of mediation.

Experiencing godhead usually involves some kind of mediation.