An excerpt from
Digital Literacy
by
Paul Gilster

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Introduction to
Excerpt
by
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"Now, at the turn of the new century, Web technologies are replacing TV, telephones, and newspapers as the primary means by which we are informed and entertained."

This century has been one of change and growth, and media and communication have been among the most rapidly developing. At the turn of the last century, theatre, the telegraph, and the newspaper entertained and informed us. By the 1930s, movies replaced theatre as popular entertainment, and telephones had replaced telegraphs as primary lines of communication. In the 1950s TV replaced movies and, later, newspapers. Now, at the turn of the new century, Web technologies are replacing all three—TV, telephones, and newspapers—as the primary means by which we are informed and entertained.
"Our ability to adapt to the Web as it adapts to us will determine its future and our own."

As each of these changes has occurred in media and communication, so too the mindset of the consuming, enjoying, learning public has changed along with them. Paul Gilster, in his book *Digital Literacy* (Wiley, 1997), describes how this latest change is occurring and how we can more readily take full advantage of the opportunities and adapt to the new possibilities, and sometimes dys-abilities, we encounter as we rely more and more on the Web.

Our ability to adapt to the Web as it adapts to us will determine its future and our own. Gilster is concerned, as the book jacket describes, with providing "Internet novices with the basic thinking skills and core competencies they'll need to thrive in an interactive environment so fundamentally different from passive media such as television or print.

Below Meridian reprints two sections from Gilster's book. One, titled "The Spinning of the Web," covers some basic history of the medium—where it comes from. The other, "Interacting with the Media," gives some examples of the Web's potential—where we're going. To transcend passive media, to go beyond "electronic print" into truly dynamic networks, we must operate the Web as dynamic thinkers no longer content to have information and entertainment merely presented to us.

As we teach the next generation of Web users about the networks available to them, we are also giving them the opportunity to learn a mindset that can allow them to stretch and explore the potential of this interactive medium. If we can help our students live up to the potential Gilster describes, we can hope one day that a final media/communication merge will erase the distinction between what it means to entertain and what it means to inform…
"The net must do all this quickly enough that we, with our modernist impatience, don't become disenchanted and find something else to do with our time."

**From Hypertext to Context**

When learning a new operating system, for example, I never read consecutively, but hit subjects I need to understand as the occasion arises.

On the other hand, hypertext is suited only to particular kinds of reading experience. I'm reading Livy's history of Rome in my spare time. Hannibal has crossed the Alps and is pushing toward Rome; no general has yet been found who can stop him, and after the disastrous battle of Cannae Rome's last army has been destroyed. Do I want to jump around in this text? Absolutely not—the text and its narrative flow demands my full attention. For the experience of story, hypertext isn't well suited; for the ability to perform research, it is useful as few tools have been. We have always had the ability to do either kind of reading. What the Internet has done through hypertext is to allow us to do one kind faster, and to consider pointers to ideas as live links to related information.

**The Spinning of the Web**

But the limits of the medium are profound. To move digital information to allow on-screen formatting, photographs, diagrams, moving video, sound, and text to appear side by side, all within the narrow constraints of bandwidth, each of these things must be turned into data packets and shipped piecemeal across the network. The packets must be reconstituted at the destination and then translated back into things we can work with on a computer screen. The Net must do all this quickly enough that we, with our modernist impatience, don't become disenchanted and find something else to do with our time.
"The key development behind the Web was Berners-Lee's creation of HyperText Transport Protocol, or HTTP."
"Remarkably, in a relatively short period of time, we're moving from an Internet that resembles an endless rummage sale to one that in striking ways resembles a library, thanks to URLs."

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user's screen. The information sent could be textual or could contain other forms of media. The World Wide Web as we know it today is the sum total of these transactions, millions upon millions of them, as they move through the universe of networked computers.

The Web uses a computer language called HyperText Markup Language (HTML)—that allows Web developers to design their pages and specify their hyperlinks, thus connecting Internet materials from files at FTP sites to Gopher menus to newsgroups, not to mention other Web pages. All this is done through the Universal Resource Locator, or URL, which can point to a particular resource no matter where it's located on the Internet. URLs compress address information into as small a space as possible. Although these "addresses" are clunky, hard to remember, and seemingly inscrutable, they tell us everything we need to know to find a particular item on the Internet. And that's no small feat, given that the Internet is composed of tens of thousands of computer networks operating off millions of separate computers and regularly traveled by tens of millions of people.

Remarkably, in a relatively short period of time, we're moving from an Internet that resembles an endless rummage sale to one that in striking ways resembles a library, thanks to URLs. At a rummage sale, you never know what you'll find, so you spend your time walking down aisles stuffed with odds and ends, occasionally running across something that catches your eye. In a library, you use the card catalog, or the electronic equivalent of it, to quickly find what you need. Like library catalog cards, URLs are pointers, so they make it possible to set up an Internet that is useful. They also let us combine Internet material, files of all kinds, into single pages
...programmers Marc Andreesen and Eric Bina, conceived the key concept that would change the Internet into today's multimedia powerhouse.
"Mosaic did for the World Wide Web what Macintosh and Microsoft Windows did for desktop computers. It democratized the process."

From Hypertext to Context

notes that could be kept on their own machines, supplementing what the Web sent over the Internet. Mosaic did for the World Wide Web what the Macintosh and Microsoft Windows did for desktop computers. It democratized the process.

It's probably not accurate to say that Mosaic launched the Internet boom that has continued unabated since 1993; after all, growth had been rapid even before this. Between January 1990 and June 1991, for example, the number of connected networks making up the Internet grew from 2,200 to 4,000, an indication that even in the text-based environment, people were becoming curious about what the network offered. Nevertheless, it seems safe to argue that without Mosaic, the widespread acceptance of the Internet by the public, and particularly its spread into the commercial world, simply would not have occurred. Doubtless it would have remained the kind of offbeat, if fascinating, tool that the commercial information services already provided in miniature, a place where modern users could work their way through the process of sending mail and downloading files, but one that would remain more or less intimidating to computer neophytes.

It was Mosaic that put the idea of the compound document firmly into the public consciousness. The Mosaic display of a well-designed Web site reminded home users of television, the medium with which they were most familiar. While a Web page didn't move, it did offer attractive graphics and the capability of at least downloading sound. Text appeared, enough to make it seem like the enterprise was content-laden, but it was pictures that made the Web so attractive to the average newcomer, because pictures aren't intimidating. The idea that you could click on a hyperlink
"The trend in Internet software development is to make it ever more television-like, combining its already powerful features with the live-picture model of the broadcast networks."
"If the Web is to compete with television (and, we hope, drive up the intellectual stakes), it must make maximum use of the things that distinguish it from traditional forms of content."

From Hypertext to Context

Companies like Progressive Networks, with RealAudio, and Xing Technology, with StreamWorks, are pursuing audio and video solutions. This means that if I'm following a major story, I can work at my desk while listening to the news on my computer over the Internet. It was only as the network began to develop these capabilities that the notion of the Net as a challenge to television began to arise. It is emerging as an alternative for viewer time, one that advertisers will have to reckon with as they plan their budgets. Time spent on the Internet is, more and more often, time spent away from the television.

Interacting with Media

If the Web is to compete with television (and, we hope, drive up the intellectual stakes), it must make maximum use of the things that distinguish it from traditional forms of content. On that score, the Web today bears disturbing parallels to CD-ROM technology. Why disturbing? CD-ROMs entered the computer world with immense promise; after all, they could hold more data than a large hard disk, making it possible to digitize entire encyclopedias on a single platter, and to include multimedia features like moving video and sound. But despite prominent exceptions like Microsoft's Encarta (an encyclopedia) and Cinemania (a moviegoer's guide to reviews), CD-ROMs have fallen victim to the "shovelware" phenomenon—it's too easy to put content on them, so developers are careless about the quality of what they sell. Few CD-ROMs on today's market live up to the potential of the medium, as witness the raft of text-based CDs that do...
"The Web is about interactivity, the ability of the user to choose information pathways and explore them with new-found ease."

nothing other than provide unedited ASCII versions of widely available out-of-copyright texts.

Numerous Web sites have fallen victim to the same carelessness. Out of an imperfect understanding of the medium, their developers have chosen to make the Web little more than a digital form of the printed page. Yes, hyperlinks are included to move you between the various documents at the site, but the potential of multimedia is often lacking, while the notion that people can read vast amounts of text on a computer screen goes unchallenged. To be effective, a Web site must transcend these limitations. The Web is about interactivity, the ability of the user to choose information pathways and explore them with new-found ease. We should be looking for sites that provide something significantly different than the usual reading and researching experience.

How do you translate the experience of television into the World Wide Web format? If you operate The Discovery Channel, the answer is that you provide links to your television shows (including a useful e-mail notification service so your users won't miss shows of particular interest), along with background information supporting your programming. But you also provide original content, using the Web's ability to link to resources that television cannot reach. You make the site an entirely different reason to tune in to the network, and if you're successful, the network benefits from the exposure.

An example of such original content is "Get Down! An Australian Adventure." It appeared on The Discovery Channel's main menu in April 1996, telling the story of Jim Malusa. In the words of the site: "A man, his bike, and his laptop challenge the merciless outback." Along with the blurb is a photograph of
"The experience is vivid, almost an out-of-body journey, for what they've done is to move between one existence, defined by their daily routine, to another, defined by its presence on the papers and screens we all use as input devices for our traditional information."
"Thus hypertext's great potential is interactive. Its linkages can lessen the separation between what we consider news on the one hand and our own experiences on the other."
"The picture we build is formed by accretion; we learn in snatches, putting the story together link by link."
"It behooves good Web page designers to always keep a map of the site in front of us, because the Web challenges us with its many different ways to explore its riches."
"A good Web site, then, is one that continually updates its content."

"If I were watching a television account of his exploits, I would need to tune in at the scheduled time. On the Web, I can check at a time of my own choosing."
"...he's linking to the telephone system through an acoustic coupler that fits onto a conventional telephone handset. That's the only way onto the Internet, long-distance over the rare outback pay phones."
"One hyperlink is as close as another on the World Wide Web."

My wandering through the Malusa story is emblematic of what can happen at a well-planned Web site. I've entered into the story as it was ongoing, prowled around long enough to understand the scenario, returned to read the introductory passages, listened to audio accounts of the planning for the trip, read updates on Malusa's progress, and received additional information on demand. Now I go back to read the letters sequentially, starting out with Jim's departure from the tropical city of Darwin, where "... the sun is one mean skilfer in the sky," and 4-foot lizards called goannas are common sights. An index to the letters makes it easy to skip around between them, but I'm now reading sequentially, following from link to link, in chronological order. I'm filling in my background information and catching up on what I've missed.

One hyperlink is as close as another on the World Wide Web. Thus far, I've stayed within The Discovery Channel's Web site, but one link takes me to a page that displays links to other Web sources. I find Australia Online, with Australian maps, news, and tourist information. The Aboriginal Page, from Australian National University, contains extensive information about aboriginal culture. Diction-Aussie is an interactive Australian dictionary, which can explain cryptic sentences like this one uttered to Jim in Darwin by a man with felt hat and tattoos: "I was once working a mob of brumbies on a station when a jackeroo asked the boss cockle what to do if he runs across a western uapin." It translates: "I was once rounding up a herd of wild horses when a cowboy asked the foreman how to avoid a venomous snake."

There is no up or down at a Web site. While the introductory page to the Malusa story could legiti-
"Learning how to turn this hybrid medium to your advantage means mastering a set of tools designed expressly for the purpose of cataloging and retrieving Web resources."
Digital Literacy

Paul Gilster

Paul Gilster is a freelance writer specializing in computers and technology. He is the author of six books about the Internet, all from John Wiley & Sons: Digital Literacy (1998), The Web Navigator (1997), The New Internet Navigator (1995), Finding It on the Internet (1994), The Mosaic Navigator (1995) and The SLIP/PPP Connection (1995). Gilster has also contributed frequently to numerous technology and business magazines, and has published essays, feature stories, reviews and fiction in a wide range of publications both in and out of the computing field. For the past twelve years, he has written the weekly "Computer Focus" column, which now appears in The News & Observer (Raleigh, NC). Before turning to writing full-time in 1985, he was, at various times, a specialist in medieval literature, a commercial pilot, and the owner of a wine shop. Even his wife got confused.

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Digital Literacy

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Trish Watson is in her final semester of the MS Technical Communication program at NC State. Her studies, research, and work experience focus on research communication channels among researchers, students, and the general public. She has taught ENG333, Communication for Science and Research, and has been a research assistant for the Center for Communication in Science, Technology, and Management, in the College of Humanities and Social Science. Her thesis examines the factors influencing participation in an electronic journal for student research at NCSU.

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