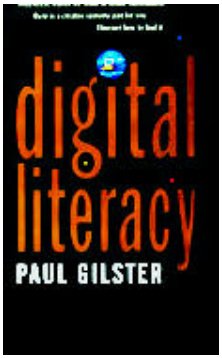
MERIDIAN

An excerpt from

Digital Literacy

by
Paul Gilster



Introduction to Excerpt

by
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Introduction

"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.

"... we must operate the Web as dynamic thinkers no longer content to have information and entertainment merely presented to us."

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…

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An excerpt from **Digital Literacy**

"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."

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.[3]

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 reconstructed 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."

These are no small problems, and no small magic is required to solve them. In typical Internet fashion, they were originally addressed by scientists out of the need to continue a far different enterprise. The physics center called CERN, for Conseil Européen pour la Recherche Nucleaire (the European Laboratory for Particle Physics), near Geneva, is world famous for its work on the smallest building blocks of matter. This is the domain of supercolliders, where particles are accelerated to near light speed and crashed into each other to create spectacular clouds of atomic debris.

The scientists who study these microcosmic incidents needed to be able to keep up with the work of their colleagues around the world, which is how Tim Berners-Lee, a British-born physicist at the laboratory, came into the picture. The idea was that hypertext, sans images, sound, and other hypermedia add-ons, could be used to foster communications between researchers, allowing them to exchange documents and data as necessary. Berners-Lee proposed the project in March 1989, and the first Web software made its appearance in 1990, running on a NeXT computer at the CERN site.

The key development behind the Web was Berners-Lee's creation of HyperText Transport Protocol, or HTTP. A Web client, or browser program, selects a particular hyperlink in a document. The link is identifiable by underlining or display in a different color from the surrounding text. When the user clicks on the hyperlink, the Web client contacts the computer at the address specified by the link and asks for the particular document being requested. The server at the other end of the connection then sends this material to the client program, which displays it on the

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***An excerpt from* Digital Literacy**

"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."

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 usefully indexed. 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."

of information. Take a file from this computer and another from that one; both can be displayed on the same World Wide Web page, for the HTML language can point to each.

The problem with hypermedia documents is that they're difficult to display. In the early days of the Web, to use a hypermedia-laden page meant downloading a file to display a graphic and calling up an external viewer to see the result. The image would appear in a separate on-screen window from the Internet session you were running to read the text. A sound file would similarly be called up through a third-party program. Each media type demanded its own player, and the result was more of a collage than a contiguous page of information. What was missing was organization, and what was needed was an appropriate software tool. Such an all-purpose viewer soon appeared in the form of a program called Mosaic.

Mosaic was developed at the National Center for Supercomputing Applications in Urbana-Champaign, Illinois, on the campus of the University of Illinois. The team that put it together, led by programmers Marc Andreessen and Eric Bina, conceived the key concept that would change the Internet into today's multimedia powerhouse. That concept was that all the resources pointed to through URLs could be displayed by a single software program, which would translate the data conveyed by HTTP into user-friendly pages. Hyperlinks would become obvious; they could be shown in blue, or underlined, or both. Text and graphics could be displayed simultaneously, while pull-down menus and mouse-driven commands could enable features like a bookmark list, where the URLs of frequently accessed pages could be stored. Annotations were possible, allowing users to write

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"Mosaic did for the World Wide Web what Macintosh and Microsoft Windows did for desktop computers. It democratized the process."

"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."

rather than submit a command also had resonance; it promised a computer network "for the rest of us," as the commercials say, one without the hassles of deep study or classroom training.

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 this seems ironic, consider that change is most likely to take deep root when it grows organically out of concepts people already understand. Thus the subsequent development of Java, a programming language created at Sun Microsystems, whose whole reason for being is to provide Web pages that are not static. Java works by downloading small applications, called *applets*, to your computer, which then run and create action on your browser's display. Static text suddenly acquires a moving logo. A ticker showing sports scores can now update itself. For the user, the effect is one of linking to something live, rather than to old information acquired through a new means.

Thus the Internet moves toward immediacy; and immediacy defines media types, a play on words that suggests an always available media presence. A newspaper is low on the immediacy scale; we read it in the morning knowing that we are seeing a summary of news as it came in several hours before. If an ongoing story catches our eye and we want an update on it, we get the update by flicking on the television, where CNN or one of the major networks points a live camera at the action.

What would stop the growth of the Internet in its tracks would be to forsake that sense of immediacy that the public now demands. Java is one way around the problem; Microsoft's ActiveX technology is another.

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