

- THE -
**INFORMATION
COMMONS**

- A PUBLIC POLICY REPORT -

by NANCY KRANICH



THE FREE EXPRESSION POLICY PROJECT
BRENNAN CENTER FOR JUSTICE
AT NYU SCHOOL OF LAW

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BRENNAN CENTER FOR JUSTICE at NYU SCHOOL OF LAW
Democracy Program, Free Expression Policy Project
161 Avenue of the Americas, 12th floor New York NY 10013
Phone: (212) 998-6730 Web site: www.brennancenter.org

Free Expression Policy Project: www.fepproject.org

Author of the report: Nancy Kranich, Senior Research Fellow, Free Expression Policy Project, 2003-04

Editing: Marjorie Heins, Director, Free Expression Policy Project, 2000-04

Design: Jon Hecht

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Thanks to David Dorman, Frederick Emrich, Lewis Friedland, Michael Gurstein, Bennett Haselton, Susan Kretchmer, Daniel Kutz, Peter Levine, Mary Minow, Miriam Nisbet, Elinor Ostrom, Alice Robbin, Wendy Seltzer, Jorge Reina Schement, Peter Suber, Julie Van Camp, and Diane Zimmerman for numerous helpful and insightful comments on a draft of this report.

EXECUTIVE SUMMARY

The Internet offers unprecedented possibilities for human creativity, global communication, and access to information. Yet digital technology also invites new forms of information enclosure. In the last decade, mass media companies have developed methods of control that undermine the public's traditional rights to use, share, and reproduce information and ideas. These technologies, combined with dramatic consolidation in the media industry and new laws that increase its control over intellectual products, threaten to undermine the political discourse, free speech, and creativity needed for a healthy democracy.

In response to the crisis, librarians, cyber-activists, and other public interest advocates have sought ways to expand access to the wealth of resources that the Internet promises, and have begun to build online communities, or "commons," for producing and sharing information, creative works, and democratic discussion. This report documents the information commons movement, explains its importance, and outlines the theories and "best practices" that have developed to assist its growth.

Human societies have always used common property, from grazing fields and town halls to streets, sidewalks, and libraries. Even in today's profit-dominated markets, economists have found that communal ownership and control of resources can be efficient and effective. Scholars meanwhile have described the salient characteristics of successful "common property regimes," including clearly defined boundaries, rules, the equal exchange of goods and knowledge, and the building of trust and social capital.

Libraries, civic organizations, and scholars have begun to turn the idea of the commons into practice, with a wide variety of open democratic information resources now operating or in the planning stages. These include *software commons*, *licensing commons*, *open access scholarly journals*, *digital repositories*, *institutional commons*, and *subject matter commons* in areas ranging from knitting to music, agriculture to Supreme Court arguments.

These many examples of information sharing have certain basic characteristics in common. They are collaborative and interactive. They take advantage of the networked environment to build information communities. They benefit from network externalities, meaning that the greater the participation, the more valuable the resource. Many are free or low cost. Their governance is shared, with rules and norms that are defined and accepted by their constituents. They encourage and advance free expression.

Building the information commons is essential to 21st century democracy, but it is neither easy nor costless. Creating and sustaining common-pool resources, and combatting further information enclosure, require investment, planning, aggressive political advocacy, and nationwide coalition building. But if the public's right to know is to be protected in today's world, citizens must have optimal opportunities to acquire and exchange information. The stakes are high, for as the Supreme Court noted years ago, American democracy requires "the widest possible dissemination of information from diverse and antagonistic sources."

INTRODUCTION

For democracy to flourish, citizens need free and open access to information. In today's digital age, this means access to information online. In the early days of the Internet, new technologies promised exactly that – abundant open access to an infinite array of resources that foster political participation and enrich people's lives. Indeed, the arrival of the information age in the last half of the 20th century inspired dreams of a utopia where people could connect with myriad ideas and with each other instantly, no longer constrained by location, format, cost, time of day, on-site rules, or other barriers.

But the same technology that enables unfettered access can also restrict information choices and the free flow of ideas. Instead of a utopia, large portions of the Internet were soon dominated by media corporations that developed “technology protection measures,” licensing terms, and other “digital rights management” techniques to restrict access to information and control its use. As a result, much online content is now wrapped, packaged, and restricted – treated as private rather than common property.

This “walled garden” or “enclosure” online creates an inequitable and often inaccessible information marketplace. Today, many Americans have little access or ability to use the new technologies. Others find their access restricted because they cannot afford the high prices or comply with the rules created by media corporations.

Public interest advocates – librarians, civil liberties groups, scholars, and others favoring open access to information and ideas – have struggled against enclosure. Despite impressive efforts, they have faced an uphill battle to influence outcomes in Congress and the courts. Now, however, the public interest community is coming together around the emerging concept of the *information commons*, which offers a new model for stimulating innovation, fostering creativity, and building a movement that envisions information as a shared resource.

A commons, simply understood, is a resource, or a facility, “that is shared by a community of producers or consumers.”¹ The resources within a commons may be either “public goods” or “common-pool resources.” Some examples of public goods are streets, parks, beaches, common transit routes, stores of knowledge, and national defense. Examples of common-pool resources include fisheries, grazing areas, mainframe computers, and, most recently, information and ideas that are shared in a plethora of online communities.

In America, the public commons in cities and towns has traditionally been a place where people gather to discuss issues, exchange information, and find solutions to social problems. In the 19th century, new institutions like public schools and libraries played a major role in spreading knowledge and cultivating civic ideals. These institutions provided opportunities to participate in political debate and learn practical skills of deliberation, negotiation, bridging differences, and advocacy.²

Today, with the Internet, citizens have vastly greater opportunities to access the information and ideas necessary for civic discourse. The information commons thus

offers a way not only of understanding the challenge posed by enclosure, but of building a fundamental institution for 21st century democracy. It provides a language to explain how the extraordinary public assets invested in the nation's information infrastructure can deliver opportunities for the participation of all citizens. As the journalist-activist David Bollier explains, focusing on the commons helps people recognize that public participation and freedom of expression are at stake in the battle to control the flow of information and ideas. The commons elevates individuals to a role above mere consumers in the marketplace, shifting the focus to their rights, needs, and responsibilities as citizens.³

The commons elevates individuals to a role above mere consumers in the marketplace.

This report starts with a necessarily brief historical overview of the evolution of the information society, the promise of the Internet, and the efforts of industry and government to control access to information. It then describes the history and theories behind the idea of the commons, and offers numerous examples of online commons that are providing new ways of storing and delivering information. It concludes with a summary of why the information commons is so important today, a discussion of strategy, and a set of policy recommendations.



I. OPPORTUNITIES AND CHALLENGES OF THE INFORMATION AGE

EVOLUTION OF THE INFORMATION SOCIETY

“Culture, like science and technology, grows by accretion, each new creator building on the works of those who came before.”⁴ Pre-literate societies relied on shared stories and songs to pass on their stock of commonly held knowledge. With the advent of writing, these societies began to fix ideas in texts that gave them portability through space and time. Early texts recorded commercial transactions, religious observance, literature and history. Great libraries, as in Alexandria, Egypt, collected these texts, written on tablets, papyrus, and other media. Later, most of Europe’s manuscripts were housed in monasteries or manors and treated as precious objects. Not until the invention of the printing press in Europe by Gutenberg around 1450 did texts become a thing – a commodity – to be bought and sold.⁵

Three centuries later, the architects of American democracy maintained that a free society must ensure accessible knowledge for all its citizens. James Madison famously declared that “a popular government without popular information, or means of acquiring it, is but a Prologue to a Farce or a Tragedy, or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors must arm themselves with the power which knowledge gives.”⁶ Benjamin Franklin, a printer, established the first lending library in America in 1731, well before he helped found the republic. At the time, his idea of sharing information resources was a radical one; in the rest of the civilized world, libraries were the property of the ruling classes and religious institutions.⁷

Two provisions of the U.S. Constitution are specifically directed toward serving this need for information that is so crucial to democracy. The Copyright Clause does so both by giving authors “the exclusive right” to profit by their writings “for limited times,” and by providing that after the limited term of copyright expires, works enter the public domain, where they are freely available to all.⁸ The First Amendment prohibits government from abridging “the freedom of speech, or of the press.”

The next important step toward today’s information society came during the Industrial Revolution. New information systems and technologies, first developed as management tools, became critical to controlling the increasingly complex process of industrial production. By the second half of the 19th century, innovations such as the telegraph and telephone led to a dramatic increase in patents and copyrights, fueling new technologies as well as demand for information. The telegraph and telephone improved the country’s capacity to distribute information instantly across long distances, and unlike commodities whose worth increases with scarcity, these emerging communication networks benefited from “network externalities” – that is, they increased in value as the number of participants grew.⁹ At the same time, social innovations such as widespread literacy and universal access to public schools and libraries established a popular demand for and interest in information.

In the 20th century, the U.S. government began to recognize that the public has an interest in the deployment of broadcasting and telephone communications.

The Communications Act of 1934,¹⁰ which created the Federal Communications Commission (the FCC), signaled a recognition that government has a role to play in making information available, and set forth a “public interest, convenience, and necessity” standard¹¹ for licensing and regulating radio and later TV broadcasting over the public airwaves. This law also established the goal of universal telephone service so that everyone would have the opportunity to subscribe at a reasonable cost.¹²

In the mid-20th century, the government contracted with the defense industry to use computers to develop databases that could manage information efficiently and effectively. One company, Lockheed, launched the “Dialog” system, which indexed educational and medical information along with defense-related data.¹³ But after a decade of federal support, a new information industry that emerged in the 1960s began urging the government to curtail or eliminate its publication programs, and warned of the dangers of a government monopoly over information. As Paul Zurkowski, the director of the newly formed Information Industry Association (the “IIA”), put it: “Just as surely as the Berlin Wall stands today, in the absence of a concerted industry-wide effort, user choice in information one day soon will be replaced by ‘free information’ from one source.”¹⁴

The Reagan Administration, sympathetic to this view, eliminated scores of government-produced publications over the next decade, contracting out federal library and information programs, and placing “maximum feasible reliance” on the private sector to disseminate government information.¹⁵ The privatization platform advocated by the IIA and fostered by the Reagan Administration was the backdrop for many of the battles to come over ownership and control of information.¹⁶

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During the 1980s, the promise of new technologies shaped both the information marketplace and the nation’s policy agenda. The breakup of the American Telephone & Telegraph Company in 1984, and a political climate favoring deregulation, enabled the Regional Bell Operating Companies to branch out into information services and cable television, where they could dominate not only the conduits for information flowing to homes and offices, but also the content of that information.¹⁷ Telephone companies had previously functioned only as “common carriers” for information produced by others. Now, they expanded into production and distribution, while the new cable TV industry also began to provide both connectivity and content. The result was an inevitable tendency by those controlling the channels of access to favor their own creations over content produced by others.

In this period, a race began between local and long distance telephone, cable television, and computer companies to dominate the new telecommunications marketplace – a race that continued through the “dot.com” boom of the 1990s. No longer limited to highly regulated telephone or television services, new conglomerates positioned themselves as multi-media information, entertainment, and shopping giants, controlling both the transmission and the content of information. Freed from technological and regulatory constraints, phone, cable, and newspaper corporations pressed investors, the courts, legislatures, governors, regulatory agencies, the President,

and the public for a position of dominance over the technological future.

Media consolidation proceeded rapidly during this period. The publisher Simon and Schuster and the CBS network both became part of the giant Viacom corporation. General Electric bought NBC, and Capital Cities/ABC bought Disney.¹⁸ At the same time, the computer industry that is so integral to telecommunications also consolidated, with products from companies like Control Data Corporation (CDC), Compaq, DEC, and Wang disappearing from the marketplace and Microsoft assuming a dominant market share.¹⁹

In 1996, Congress passed the first wholesale revision of communications law since the 1934 Communications Act. To promote even more deregulation, the Telecommunications Act of 1996 relaxed earlier limits on how many radio or TV stations a single company can own, and eliminated barriers to cross-ownership of local and long distance telephone services, broadcast, cable television, and newspapers.²⁰ Despite claims that this deregulatory approach would bring down prices, lower entry barriers, and increase diversity, the 1996 law has resulted in less competition, with fewer companies controlling the sources of information, its content, and its cost. Telecommunications giants have resisted the opening of their markets, while agencies like the FCC and the Federal Trade Commission, created to serve the public interest and stop undue concentrations of economic power, have failed to intervene.²¹

When the first edition of Ben Bagdikian's *The Media Monopoly* was published in 1983, the author voiced concern about the domination of the media business by fifty companies, and warned against the chilling effects that control by such large and powerful entities could have over the free flow of diverse ideas and information. Critics at the time called Bagdikian "alarmist."²² Today, the number of corporations controlling most of America's magazines, radio and TV stations, books, movies, and daily mass-circulation newspapers has dropped from fifty to ten, with those conglomerates amassing unprecedented influence over what Americans see, hear, and read through the mass media.²³

The FCC's decision in 2003 to loosen its already relaxed media consolidation and cross-ownership rules is likely to reduce the number of media owners still further, resulting in less diversity and more concentrated control over ideas and information.²⁴ Although some observers argue that the vast resources of the World Wide Web will counteract this trend toward consolidation and top-down control, recent research from Harvard's Kennedy School of Government suggests that the way the Web's portals and search engines are constructed may actually exacerbate, rather than remedy, the effects of media concentration by making it tougher to find all those independently created resources that are now available online.²⁵

THE PROMISE OF THE INTERNET AND THE CHALLENGE OF INFORMATION ACCESS

At the outset of the Internet age, user-friendly software programs empowered consumers to become creators, producers, and distributors of information. Even before the invention of the World Wide Web, online conferencing systems like The Well, search and retrieval agents like Gopher, online forums like community freenets, bulletin boards and listservs, and newsgroups organized within the Usenet network allowed those with Internet access to generate, receive, and exchange information readily and easily.²⁶ By the mid-1990s, increasing numbers of Americans

had Internet connections and were using these resources. As the Supreme Court recognized in 1997:

Through the use of chat rooms, any person with a phone line can become a town crier with a voice that resonates farther than it could from any soapbox. Through the use of Web pages, mail exploders, and newsgroups, the same individual can become a pamphleteer. ... [In short,] “the content on the Internet is as diverse as human thought.”²⁷

As David Bollier summarized, in cyberspace, everyone can be a creator, thereby privileging “more idiosyncratic, unpredictable, and democratic genres of expression.”²⁸

The Internet facilitated not only expression “as diverse as human thought,” but “peer production” – that is, decentralized production and distribution of information that bypasses the centralized control of more traditional publishing. As the legal scholar Yochai Benkler writes, peer production is “a process by which many individuals, whose actions are coordinated neither by managers nor by price signals in the market, contribute to a joint effort that effectively produces a unit of information or culture.”²⁹ The result is commons-based production of knowledge that, while not challenging individual authorship, fundamentally alters the current system in which commercial producers and passive consumers are the primary players.³⁰

New technologies also enabled computer programmers to design their own versions of software, some of which they distributed freely. Copying and sharing of programs as well as information thus became widespread online. High-speed networks and computers provided the means for rapid and exact reproduction. Open standards and protocols eased the way for this sort of information to flow freely over the Internet. While some standards were negotiated through national and international organizations,³¹ others, such as Adobe’s Acrobat portable document format (“PDF”), became the *de facto* proprietary standard. PDF is now generally used for distributing and exchanging documents around the world.

All of these developments threatened the business models of traditional content producers. The media industry responded by creating digital rights management (“DRM”) techniques, pressing for legislation to give those techniques the force of law, and intensifying its efforts to strengthen control over the use of its products at the expense of vital “free expression safety valves” within copyright law. These traditional safety valves balance the public’s interest in open access with the property interests of copyright owners. They include:

- ✱ “Fair use,” which permits artists, students, journalists, and others to quote and copy limited amounts of copyrighted works for such purposes as commentary, parody, scholarship, or news reports;
- ✱ The “first sale” rule, which allows purchasers of copyrighted materials to lend them, give them away, or share them with others; and
- ✱ The public domain – a realm of free access that includes not only government publications and other resources that are not subject to copyright, but all creative works, once the limited term of copyright protection expires.²⁹

DRM techniques are basically technologies that enable media companies to limit, monitor, and control the transport and use of their products. Restrictive licensing agreements are one example: they now control access to digital materials – both copyrighted and public domain – that are compiled in numerous databases such as Lexis/Nexis. Some licenses are imposed on consumers as a condition of entering a Web site (“clickwrap” licenses) or when they download software. These non-negotiable agreements often prohibit fair use and prevent the kind of sharing permitted by the first sale rule.³³

Other DRM techniques include encryption or scrambling of expressive material, or the embedding of a watermark or tag. They are designed to control access to and copying of online information (including backup copies for personal use).³⁴

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To prevent consumers, hackers, scholars, and others from circumventing encryption, media companies persuaded Congress to pass the 1998 Digital Millennium Copyright Act (the DMCA). The DMCA imposes criminal penalties for circumventing “technological measures” such as encryption, or even distributing circumvention tools.³⁵ The Clinton Administration, which initially

responded to the promise of the Internet with a National Information Infrastructure (or “NII”) initiative that focused on promoting and protecting both technology and information, eventually helped shape the DMCA with a 1995 white paper that rejected user rights to browse, share, and make personal copies of digital works.³⁶

Users attempting to circumvent encryption, scrambling, and other “technological measures,” even for legitimate reasons such as fair use or lending and sharing as permitted under the first sale rule, are likely to violate the DMCA. Moreover, anyone – including a scientific researcher – who creates and distributes circumvention technology is in danger of both criminal prosecution and civil liability.

Thus far, courts have upheld the DMCA against First Amendment challenges, even while acknowledging its adverse impact on first sale and fair use rights.³⁷ These courts have declined to follow a 1984 Supreme Court decision that turned back an earlier attempt by the media industry to outlaw a product of new technology – in that case, the video cassette recorder. Like circumvention tools, VCRs can be used to violate the law by copying and redistributing TV programs. But the Court ruled that a technology cannot be outlawed simply because it might be used for copyright infringement, as long as it also has “significant noninfringing uses.”³⁸

Public interest advocates have urged Congress to modify the DMCA and pass other legislation to protect first sale and fair use rights online. At the same time, media companies have lobbied for laws that would strengthen and enforce both copyright and DRM techniques.³⁹ For example, the industry has asked Congress to overrule a 1991 Supreme Court decision that rejected an attempt to expand copyright to cover factual data such as telephone directory listings. The Court in that case affirmed that only “original works of authorship,” not facts arranged in a directory, get copyright protection.⁴⁰ The proposed “Database and Collections of Information Misappropriation Act” would overrule this decision and expand copyright control to compilations of facts.⁴¹

The same year that it passed the DMCA, Congress exacerbated the problem of enclosure with the Sonny Bono Copyright Term Extension Act (the “CTEA”). The CTEA extended the already lengthy duration of copyright protection for 20 years, to the life of the author plus 70 years for individuals and their estates, and 95 years for corporate-controlled works. It thereby prevented hundreds of thousands of writings, films, songs, and documents of all kinds, some produced as long ago as the 1920s and ’30s, from entering the public domain, even though the great majority of them have no commercial value.⁴² The Supreme Court rejected a constitutional challenge to the CTEA in 2003, in a decision that seems to give Congress the power to extend the originally short copyright term almost indefinitely into the future.⁴³

Finally, the efforts of media companies to shut down file-sharing services that enable users to exchange music and many other types of expression online, and their prosecution of individuals believed to be sharing copyright-protected files, have produced sharp political and cultural conflicts.⁴⁴ Although debate continues over the right legal and policy approach to the phenomenon of file-sharing, it has many useful and legitimate purposes – for example, scholars sharing research – and its popularity suggests the need for commons-like alternatives to a monolithically property-based approach to online expression.



The tensions between information as a public good and information as a commodity in our post-industrial era have given rise to a highly contested policy environment. The different priorities – to guarantee equal access to information so that all citizens can meaningfully participate in public discourse, to enable consumers to choose among products and services, and to protect the public from government intrusion into the free flow of ideas – have strained the information chain.

The longstanding drive to commodify information goods and services often overlooks a central fact about information: it is neither a pure public good nor a pure private good. It is a good that people simply do not use up, as they do other commodities. When transmitted, information often exhibits “network externalities” – that is, its value can escalate with increased use.⁴⁵ Commodifying information also overlooks the importance of open access to innovation and creativity.

Media companies may have persuaded Congress and other policymakers that information is private property, and therefore under the control of an owner. But legal scholar Carol Rose counters that property regimes and even individual property holdings are “by no means self-evident constructs”; instead, they are “property arrangements that people have quite consciously talked themselves into.” Consequently, “if property regimes cannot get over the self-interest problem without imparting some sense of a common good, then narratives, stories, and rhetorical devices may be essential in persuading people of that common good.”⁴⁶ As Rose suggests, a new narrative of the commons is needed to persuade policymakers and the public of the promises and opportunities of equitable access, free expression, and fair use in the digital age.

II. THE EMERGING INFORMATION COMMONS

HISTORY AND THEORIES OF THE COMMONS

Americans jointly own, share, and administer a wide range of common assets, including natural resources, public lands, schools, libraries, and scientific knowledge. It is often difficult for these essential resources to attract the funding necessary to sustain their future, especially when the marketplace dominates political priorities. Yet neglecting them impoverishes culture and endangers democracy. It is for this reason that, as the legal scholar Edwin Baker notes, “most democracies use a combination of market and nonmarket devices” to assure that citizens get the information they need. Among the important nonmarket devices have been government publications, public libraries, and public broadcasting.⁴⁷

Historically, the “commons” meant the agricultural fields used freely by farmers in England to grow food and pasture animals. Between 1500 and 1800, however, many of these common fields were transformed into private property in order to boost agricultural production, accommodate population changes, improve soil, advance industrial development, and bring lands under the control of wealthy aristocrats. This “enclosure” movement transformed a traditional, communal method of agriculture into a system in which one person’s farm became separated from his neighbors’. Enclosure occurred both piecemeal and by general legislative action. No single decision or act caused the enclosure of public fields – a story similar to today’s enclosure of the commons of the mind.⁴⁸

But throughout history, people have retained common property such as forests, fields, and fisheries, and have managed these resources effectively, without depleting them. The debate that has ensued for hundreds of years over ownership of property thus remains unresolved. Traditionally, lawyers and economists have considered ownership either within the realm of a marketplace for private property or a market failure requiring government management. Resources such as common property have fallen between this private-public ownership dichotomy.⁴⁹

The 1861 publication of *Ancient Law* by Henry Sumner Maine fueled this debate about whether landed proprietors have a special role needing legal protection, and about the legitimacy of enclosing communally owned properties.⁵⁰ More recently, economists have begun to recognize common property as a legitimate framework for managing certain categories of goods. In the mid-1950s, the social scientists H. Scott Gordon and Anthony Scott kicked off their own debate about the commons by introducing an economic analysis of fisheries in two articles that are now credited with outlining the conventional theory of the commons.⁵¹ Then, Garrett Hardin wrote his now-famous 1968 article, “The Tragedy of the Commons,” which used the example of overgrazing to argue that unlimited access to resources results in excessive demand and, consequently, in overexploitation.⁵² Unwilling to concede to Hardin’s argument, scholars from several disciplines began countering with their own studies of common property resources, where group control over the resource does not lead to overuse, but to the balancing of benefits and costs.⁵³

Prominent among these scholars is Carol Rose, who has proposed the reverse of the tragedy of the commons for certain types of activities where individuals may “underinvest,” as at a festival or on a dance floor. At least within the limits of the community, the more who join, the greater the enjoyment of each participant. “Activities of this sort may have value precisely because they reinforce the solidarity and fellow feeling of the community as a whole; thus, the more members of the community who participate, even only as observers, the better for all.” Rose refers to this type of behavior as the “comedy of the commons,” because indefinite numbers and expandability of participation enhance rather than diminish value. She elaborates on this idea using the phrase “the more the merrier” and analogizing to economies of scale, where the larger the investment, the higher the rate of return. Rose contends that people need encouragement to join such nonexclusive activities, where their participation produces beneficial “externalities” for others.⁵⁴

Since Hardin, other scholars such as Siegfried Ciriacy-Wantrup and Richard Bishop have distinguished between two types of legal regimes that govern commons: *open-access* (or “no property”) regimes and *common property regimes*. With open access regimes, nobody has the legal right to exclude anyone else from using the resource, but the tragedy of the commons may ensue because of overuse or destruction. In contrast, common property regimes, which regulate the use of so-called “common-pool resources,” provide members of a clearly defined group with a bundle of legal rights, including the right to exclude nonmembers from using the resource; here, the comedy of the commons is more likely.⁵⁵ Some of the examples of information commons described later in this report fit the open access model; others are closer to common property regimes.

The common-pool resources that are regulated by common property regimes resemble what economists call public goods, such as parks, public transportation, police and fire protection, and national defense. Neither common-pool resources nor public goods can exclude beneficiaries easily. But unlike public goods, common-pool resources are managed based on intensity of use and delineation of eligible users.⁵⁶

Since the late 1960s, economists have debated the emergence, efficiency, and stability of common property regimes. One leading economist, Carl Dahlman, concluded that economic theory does not imply that communal ownership and collective control are necessarily inefficient. On the contrary, he says, economic theory will predict that under certain conditions, such arrangements are superior to private ownership and individual control.⁵⁷

A number of other social scientists and legal scholars have also examined how common property resources work. A leader in the field, Elinor Ostrom, has analyzed the characteristics of resources held in common, and concluded that the common property regimes that regulate these resources are distinguished by group, rather than individual, control; the group is then responsible for balancing benefits and costs, defining who may participate in resource use and to what degree, and designating who will make management decisions.⁵⁸ Ostrom and her colleague Edella Schlager underscore that it is “the difference between exercising a right and participating in the definition of future rights to be exercised ... [that] makes collective-choice rights so powerful.”⁵⁹

To counter Hardin's presumption that all common-pool resources are open access, Ostrom studied the behavior of these resources when they are regulated under common property regimes. In a study for the National Research Council in the mid-1980s, she outlined the components of governance necessary to sustain common property resources efficiently, focusing initially on natural resources in developing countries.⁶⁰ Later, she helped found the International Association for the Study of Common Property (IASCP), which hosted a 1995 conference entitled "Reinventing the Commons." The conference focused on new topics such as genetic resources, roads, the atmosphere, biodiversity, patents, and the Internet.⁶¹

Ostrom's seminal work, *Governing the Commons*, provided a systematic blueprint for understanding the economic and experimental foundations for common property regimes. By studying a variety of common-pool resources in order to respond to Hardin's "tragedy," Ostrom laid out a framework for assessing commons, plus eight design principles that enable people to use these resources over a long period of time. Included in the framework are conditions necessary for self-governance: clearly defined boundaries, the design and enforcement of rules, reciprocity (the equal exchange of goods and knowledge), building trust and social capital, and communication channels.⁶² Thanks to Ostrom and her colleagues, groups interested in developing and managing common property now have a useful framework for understanding how to do it.

More recently, Ostrom has applied her theories to understanding information as a common property resource. Together with Charlotte Hess, Ostrom has described the complex tangible and intangible attributes of information, particularly in digital form, with its fuzzy boundaries, diverse community of users on local, regional, national, and international levels, and multiple layers of rule-making.⁶³

APPLYING THE IDEA OF THE COMMONS TO INFORMATION

Just as common property scholars are presenting a framework for understanding and governing commons, scholars in other fields have recognized the importance of shared information spaces for promoting democracy and the free flow of ideas. Civil society researchers such as Harry Boyte, Peter Levine, and Lewis Friedland emphasize that shared public spaces are needed to rekindle civic participation.⁶⁴ Others who document the impact of technology on society, like Lawrence Grossman, Anthony Wilhelm, and Douglas Schuler, accentuate how access to cyberspace presents both promises and challenges for wider participation in a 21st century democracy.⁶⁵ Legal scholars have grasped the idea of the commons as a new approach to understanding the nature of information, and to countering restrictions imposed by copyright rules and DRM techniques.⁶⁶ Joining these scholars are librarians and other public interest advocates who see the commons as a useful tool to reclaim public space and promote the public interest in the digital age.⁶⁷

A leader in the field has been David Bollier, who considers the commons a critical contribution to a community of shared moral values and social purpose. The value of the information commons thus goes far beyond maximizing economic utility. Bollier and his colleague Tim Watts explain: "A commons analysis gives us a way to speak coherently about another matrix of concerns that are not given sufficient attention: democratic participation, openness, social equity, and diversity."⁶⁸

The legal scholar Yochai Benkler also emphasizes the importance of the commons to promoting participation. Quoting the Supreme Court, Benkler argues that a fundamental commitment of American democracy is to ensure “the widest possible dissemination of information from diverse and antagonistic sources.”⁶⁹ Such a commitment requires policies that make access to and use of information resources equally and ubiquitously available to all users of a network. Benkler concludes:

An open, free, flat, peer-to-peer network best serves the ability of anyone – individual, small group, or large group – to come together to build our information environment. It is through such open and equal participation that we will best secure both robust democratic discourse and individual expressive freedom.⁷⁰

Moving from theory to practice, library science professors Karen Fisher and Joan Durrance have examined how information communities unite people around a common interest through increased access to a diffused set of information resources. The Internet is often the hub of these communities, facilitating connections and collaborations among participants, the exchange of ideas, distribution of papers, and links with others who have similar interests and needs. They describe five characteristics that distinguish these Internet-based information communities:

- ❖ information-sharing with multiplier effects;
- ❖ collaboration;
- ❖ interaction based on needs of participants;
- ❖ low barriers to entry; and
- ❖ connectedness with the larger community.

According to Fisher and Durrance, online communities that share the production and distribution of information are likely to experience increased access to and use of information, increased access to people and organizations, and increased dialogue, communication, and collaboration among information providers and constituents.⁷¹

Civil society scholars Lewis Friedland, Harry Boyte, and Peter Levine have tested the idea of the commons by establishing information communities in St. Paul, Minnesota and Prince Georges County, Maryland, in order to promote civic engagement, particularly among young people. Levine believes that such commons are appealing because they are not controlled by bureaucrats, experts, or profit-seeking companies, and they encourage more diverse uses and participation. Yet he also recognizes the vulnerability of such endeavors if they fail to adopt appropriate governance structures, rules, and management techniques so that they are equipped to survive in the face of rival alternatives, and avoid the anarchy that can result in the tragedy of the commons as described by Hardin.⁷²

Friedland, Boyte, and Levine acknowledge the historic role of institutions such as newspapers, schools, libraries, and community festivals in providing opportunities for democratic participation and a collective deliberative voice. To promote and sustain newly emerging information commons, they urge continued sponsorship and collaboration with such institutions, along with careful attention to governance structures.⁷³ These scholars believe that by applying the framework for governance and management developed by social scientists like Ostrom, organizers of commons are more likely to succeed in offering robust, democratic alternatives to the market.

St. Paul Community Information Corps, <http://www.westsidecic.org>,⁷⁴ was the first practical experiment in building a community commons. Launched by Lewis Friedland, Harry Boyte, and Nan Skelton, it uses technology tools to involve young people in work on community projects such as mapping, creating a learning directory, and computer training.⁷⁵

The Prince Georges County Information Commons,

<http://www.princegeorges.org>, is a democratic, participatory, nonprofit association that produces Web sites, email discussions, databases, digital maps, streaming or broadcast videos, tutoring services, Internet access, free software, and local policy initiatives as a service to the community. Led by Peter Levine, it partners with similar groups in other communities to create a national movement to promote local information commons and encourage the involvement of youth in community activities.

Civic-minded organizations have also assumed a role in advancing the information commons. In 2000, Lewis Friedland's Center for Democracy and Communication at the University of Wisconsin and Harry Boyte's Center for Democracy and Citizenship at the University of Minnesota hosted a New Information Commons Conference where participants sketched out a plan for citizens, in partnership with community organizations, to build new information spaces.⁷⁶ At about the same time, the New America Foundation launched its Information Commons Project, directed by David Bollier.⁷⁷ Jeffrey Chester's new Center for Digital Democracy began a "Dot Commons" project to promote public access to noncommercial sources of information.⁷⁸ On a more local level, students created the Swarthmore Coalition for the Digital Commons, a computing freedom group dedicated to preserving the free and open exchange of information both on campus and off.⁷⁹

In the fall of 2001, the American Library Association sponsored a conference on the Information Commons, with commissioned papers on information equity, copyright and fair use, and public access.⁸⁰ A similar meeting at Duke University, sponsored by the Center for the Public Domain, a philanthropic foundation, followed.⁸¹ Funding from the Rockefeller Foundation has helped ALA continue its work on the commons, and the Mellon Foundation has enabled the Indiana University Workshop in Political Theory and Policy Analysis to study how scholars are using the concept of the commons to counteract the enclosure of academic research and publication.⁸²

In 2002 and 2003, the journals *Boston Review*, *Knowledge Quest*, and *Common Property Resource Digest* devoted full issues to the concept of the information commons.⁸³ The Friends of the Commons, started with help from David Bollier and funding from the Tides Foundation, published its first annual report, *The State of the Commons*, in 2003.⁸⁴ At the World Summit on the Information Society in December 2003, the advocacy group World-Information.org issued a newspaper for delegates focusing on the topic, and posted other articles on its Web site.⁸⁵

Meanwhile, public interest advocates such as the Electronic Frontier Foundation, the Center for Digital Democracy, the Center for Democracy and Technology, Public

Knowledge, and IP Justice began pushing for more balanced information policies.⁸⁶ Some legislators responded with bills to encourage greater access to scientific research results, enhancement of the public domain, and expanded rights for information consumers.⁸⁷ The law professor and cyber-activist Lawrence Lessig initiated an online campaign to petition Congress to amend the Copyright Term Extension Act so that owners would have to pay a \$1 renewal fee after 50 years. Since only about 2% of the works whose copyrights were extended by the CTEA have any commercial value, most owners would not bother with even this minimal exertion. The proposed legislation would thus allow much of the remainder into the public domain after 50 years rather than the longer terms dictated by the CTEA.⁸⁸

Complementing these efforts is an initiative by Public Knowledge, Creative Commons, and the Center for the Study of the Public Domain to collect “public domain stories” in order to construct a new narrative that dramatizes the value of public domain property and the cost to society when it is lost. The organizers explain:

We are collecting stories of citizens who are hampered by restrictive intellectual property laws. If you have a personal story of copyright, trademark or patent laws needlessly hindering your work and ideas, we want to hear from you. Conversely, if your work has benefited from the availability of art and information in the public domain, we want to know about it.⁸⁹

All of these activities are calling attention to the commons as a new, dynamic approach to serving the public interest in the digital age. At the same time, initiatives sponsored by scientists, librarians, nonprofit groups, and many others have demonstrated that the information commons can actually flourish. Many of these initiatives are highlighted in the next section.

EXAMPLES OF OPEN DEMOCRATIC INFORMATION RESOURCES

New initiatives with characteristics of common property regimes are emerging. They share features such as open and free access for designated communities, self-governance, collaboration, free or low cost, and sustainability. Some of these projects use the Internet itself as a commons, employing open source software, peer-to-peer file sharing, and collaborative Web sites, while others are more focused on content creation and dissemination. While some consider the whole Internet or the public domain⁹⁰ to be types of commons, these are essentially open access resources and lack the clearly defined group governance that is characteristic of common property regimes. Thus, while not every example below fully embodies all aspects of commons, they all represent exciting new alternatives to a purely private property-driven approach to information and ideas.

Software Commons

Computer software designers were among the first to recognize the importance of developing a commons-like structure to share computer code and collaborate on modifying and upgrading electronic products. Innovative programmers created hundreds of open source software applications that are available without the restrictive licensing provisions of commercial software.⁹¹ The best known example is Linux,⁹² an open source version of the UNIX operating system. Other examples include personal

digital assistants (PDAs) that use Linux, and “Wiki,” a collaborative authoring tool for Web pages.⁹³ The Google search engine also runs its servers on the Linux open source system.⁹⁴

Most open source software, while not in the public domain, is available for little or no cost and can be used and redistributed without restriction. End users are welcome to review, use, and modify the source code without payment of royalties, as long as their changes are shared with the open source community. Open source preserves the digital commons, while ensuring that breaches in licensing terms are subject to rules and an enforcement regime. The code is protected by a special license so that improvements cannot be redistributed without the source code.⁹⁵ Open source harnesses the distributive powers of the Internet, parcels the work out to thousands, and uses their contributions to build and improve the software.

While colleges and universities have long collaborated on open source projects such as Linux, financial strains are now prompting them, along with a number of national, state, and city government entities, to mandate the use of open source. While some for-profit companies like Microsoft are nervous about the increasing popularity of open source, others, such as Sun Microsystems, are offering government entities the StarOffice program for free; it is based on the open source software called OpenOffice.⁹⁶ In 2001, IBM committed to supporting Linux, and now has a growing pool of more than 6,000 customers.⁹⁷ Perhaps most significant, the next generation of computer operating system, “Grid,” is built on open source software.⁹⁸

The open collaborative software model has spread to other fields. Biologists are using open source methods to build massive databases, such as genetic sequencing, that are essential to lab research.⁹⁹ NASA uses open source principles for its Mars mission, with the help of volunteers who identify craters and map the planet.¹⁰⁰ Prentice Hall is publishing a series of computer books that readers can modify and redistribute.¹⁰¹ There is even an *Open Source Cookbook*.¹⁰²

Other examples of open source software commons include Project Gutenberg Distributed Proofreaders, which contributes to a respected online archive of works that are in the public domain; the Open Digital Rights Language Initiative, an international effort aimed at developing an open standard for managing DRM for the publishing, education, entertainment, and software industries; and the Open Directory Project, “the largest and most comprehensive human-edited directory of the Web.”¹⁰³ These and other software commons are described in the box on page 17.

Licensing Commons

Licensing is the process that copyright owners use to control reproduction, distribution, or other use of creative works. Many licenses are highly specific, restrictive, and costly. To build the information commons, creators have begun to use the licensing model to relax the stringency of commercial licenses and grant permissions for many uses in advance, while still maintaining some control over their work. By using licensing arrangements quite different from those of media companies, they are able to contribute their work to open-access publications and digital repositories.

EXAMPLES OF SOFTWARE COMMONS

Project Gutenberg Distributed Proofreaders, <http://www.pgdp.net/c/default.php>, is an initiative that enables many proofreaders to work on a book at the same time by breaking it into individual pages, thus significantly speeding up the e-book creation process. By late 2003, Project Gutenberg had more than 10,000 public domain books online. According to *Wired* magazine, “The method is proving to be as broadly effective – and, yes, as revolutionary – a means of production as the assembly line was a century ago,” while embodying “the spirit of democratic solutions to daunting problems.”¹⁰⁴

The Open Digital Rights Language Initiative (ODRL), <http://odrl.net/docs/ODRL-brochure.pdf>, provides free and open standards for describing content, permissions, conditions, and parties to agreements regarding access to and use of digital media. The aim is “to support transparent and innovative use of digital resources.” All ODRL specifications are available for general use without obligations and licensing requirements.

The Open Directory Project (ODP), <http://dmoz.org/about.html>, provides a means for organizing portions of the Internet. It is also known as DMOZ, an acronym for Directory Mozilla, reflecting its loose association with Netscape’s Mozilla project, an open source browser initiative. The ODP consists of volunteer editors who manage the Directory’s growth and make it available as a free and open resource. The Project is hosted and administered as a noncommercial subsidiary of Netscape Communication Corporation, but it functions as a self-governing community.

SETI@home, <http://setiathome.ssl.berkeley.edu>, is “a scientific experiment that uses Internet-connected computers in the Search for Extraterrestrial Intelligence (SETI).” The project allows anyone to participate by downloading its free program that analyzes radio telescope data. In turn, SETI’s computers borrow participants’ idle computer resources to crunch massive amounts of data coming from the Arecibo telescope. The goal is to analyze more data than any single computer, no matter how powerful, is able to do, and ultimately to find out if there is other intelligent life in the universe.

The Open Video Project, <http://www.open-video.org>, is a shared repository intended to help researchers study ways to catalog, retrieve, preserve, and interact with digitized video once widespread access is available. The collection is housed at the University of North Carolina and contains video and descriptive information for close to 2,000 digitized video segments. It comprises one of the first channels of the Distributed Storage Infrastructure Initiative, a project that supports distributed repository hosting for research and education in the high-speed Internet 2 community.

Still Water, <http://river.asap.um.maine.edu/%7Ejon/pool/splash.html>, a project of the University of Maine’s New Media Lab, is a collaborative online environment for creating and sharing images, music, videos, programming code, and texts. This experiment in open sourcing of creative work allows artists of all kinds to share their work more actively.

One such licensing arrangement is the GNU General Public License (GPL), developed by Richard Stallman at MIT in the 1980s. The GPL guarantees that the material is free for all its users, and that it can be copied, shared, and modified. It applies to most of the software distributed by the Free Software Foundation, the organizational sponsor of the GPL Project, and to any other program whose authors commit to using it. When users distribute copies of such programs, the license requires that they give the recipients all the same rights and make sure that they receive or can get the source code.¹⁰⁵

The GPL helps online communities of software developers maintain legal control over their collective output by ensuring that anyone can be a free-rider, which promotes use of the software code and improvements, and preventing anyone from privatizing the code and claiming proprietary control. According to David Bollier, the importance of the GPL is that it “assures that the fruits of the commons will stay in the commons. This gives the commons significant structural advantages over corporate-sponsored software development.”¹⁰⁶ Increasingly, the openness as well as the economics of supporting open source software makes it more desirable for businesses as well as governments and nonprofit institutions.

The Creative Commons was founded to offer a similar set of flexible copyright licenses for public use, with some rights reserved. It also offers a Web application that helps people dedicate their creative works to the public domain or license them as free for certain uses, under certain conditions. Established in 2001 by Lawrence Lessig, James Boyle, and other cyberlaw and computer experts with support from the Center for the Public Domain, Creative Commons aims to increase the amount of source material online, “develop a rich repository of high-quality works in a variety of media, and promote an ethos of sharing, public education, and creative interactivity.”¹⁰⁷ As of January 2004, at least one million Web pages have used a Creative Commons License.¹⁰⁸

Scholarly Communication: Open Access

In the 1980s, many professional societies turned over their journal publishing to private firms as a way to contain membership fees and generate income. The short-term financial gains, however, were offset by serious losses in terms of access to research results once journal prices outpaced library budgets. Prices of scholarly journals soared, and publishing conglomerates restricted access through expensive licenses that often require bundled or aggregated purchase of titles.¹⁰⁹

As a result, research libraries had no recourse but to cut many of their journal subscriptions. Faced with an increase in subscription prices of 220% since 1986 for journals like *Nuclear Physics*, *Brain Research*, and *Tetrahedron Letters*, which now cost close to \$20,000 per year,¹¹⁰ the academic community has sought ways to reclaim control of its research and scholarship. Librarians have joined with scholars, academic administrators, computer and information scientists, nonprofit publishers, and professional societies to create more competition in, and alternative modes of, scholarly publishing. While they may not define their efforts as a unified movement, scholars have thus succeeded in launching well-managed, self-governed research commons that promise sustainability and alternatives to the restrictive private-sector market.

Librarians have led the movement to develop alternative publishing modes. For many years, the Association of Research Libraries (ARL) has collaborated with foundations and higher education colleagues to document the problem and identify solutions to the crisis faced by its members.¹¹¹ The American Library Association's Association of College and Research Libraries added another voice to the movement to reclaim the fruits of scholarship in June 2003 by endorsing a statement of *Principles and Strategies for the Reform of Scholarly Communication*.¹¹²

Following the librarians' example, the European and American academic communities have created new institutions to manage and disseminate scholarly information. Foremost among them is the Scholarly Publishing and Academic Resources Coalition (SPARC), founded in 1998 as an alliance of universities, research libraries, and organizations. SPARC now has 300 member institutions in North America, Europe, Asia, and Australia.

The Scholarly Publishing and Academic Resources Coalition (SPARC), <http://www.arl.org/sparc>, is a response to "market dysfunctions in the scholarly communication system," which "have reduced dissemination of scholarship and crippled libraries." SPARC helps "to create systems that expand information dissemination and use in a networked digital environment while responding to the needs of academe." It pursues three strategies: *incubation of alternatives* to high-priced journals and digital aggregated databases; *advocacy* "to promote fundamental changes in the system and culture of scholarly communication"; and *education* to raise awareness among scholars about new publishing possibilities.

Beyond projects undertaken by SPARC, many professional societies in the U.S. are adopting new paradigms for sharing research results. The American Anthropological Association offers its members free online access to a vast array of resources in anthropology. Similarly, the American Physical Society permits its authors to post articles to digital repositories.¹¹³ Because the crisis in scholarly publishing hit science early and hard, the scientific community has led the way in designing new modes to exchange research and data.

One significant initiative is open access publishing, which allows wide access to scholarly information online, without price and permission barriers. Committing to open access means dispensing with the financial, technical, and legal barriers that limit access to research articles to paying customers. Like thousands of other online publications, open access scholarly resources are available without charge. In addition, though, they are free of many copyright and licensing restrictions, and some of them have other attributes of common property regimes. Among the more than 700 open-access journals, as of 2004, were titles as diverse as *Cell Biology Education*, *Journal of Arabic and Islamic Studies*, *The New England Journal of Political Science*, and *Public Administration and Management*.¹¹⁴

For scholars, being published in freely available online open-access journals has dramatically increased the frequency of citation, ensuring greater impact and faster scientific progress, particularly beyond the borders of North America and Europe.¹¹⁵ As Peter Suber, a former philosophy professor who now works for SPARC and Public

Knowledge, writes, adopting these new standards and structures will not only reduce costs, but overcome barriers to access such as restrictive copyright laws, licenses, and DRM.¹¹⁶

In 2002, the Soros Foundation's Open Society Institute developed the Budapest Open Access Initiative in order to provide leadership, software, technical standards, and funding for the development of new open-access commons of scholarly literature in all academic fields. By early 2004, the Initiative had been signed by 3,190 individuals and 247 organizations worldwide, representing researchers, unions, laboratories, libraries, foundations, journals, publishers, and learned societies. A number of new, online open access journals began publication, funded by foundations, academic societies, and other nonprofits, with assistance from SPARC and the Open Society Institute.¹¹⁷

The challenge, of course, is to find additional and continuing ways to finance these ventures. So far, the most common methods have been securing grants from foundations and charging authors (or indirectly, the funders of their research) for publication. In June 2003, a group of scientists, librarians, higher education institutions, publishers, and scientific societies issued a statement acknowledging that the cost of publishing results is an essential part of scientific research and should not be passed on to readers. This "Bethesda Statement on Open Access Publishing" commits the signatory organizations to the transition to open access publishing and sharing of scientific research results as widely as possible.¹¹⁸ In October 2003, German, French, Chinese, Italian, Hungarian, and Norwegian research organizations signed a similar statement, the "Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities."¹¹⁹

Another important foray into open access publishing for scholarly journals came from Oxford University Press in August 2003, when it announced an "open access experiment" with the annual Database Issue of its *Nucleic Acids* journal. Published online in January 2004, the test issue contained a record number of 142 freely available, peer-reviewed papers, with 90% of the authors agreeing to pay the £300 author charge.¹²⁰ Martin Richardson, a managing editor of the Journals Division at the Press, observed: "The real test will come as we begin to increase the author charges to reflect the true publishing costs." He added that the Press would take a "staged approach" to explore issues surrounding transition to open access.¹²¹

In June 2003, Representative Martin Sabo of Minnesota introduced the Public Access to Science Act, a bill that would put the results of federally funded research in science and medicine into the public domain. The proposed legislation would eliminate copyright controls for any work produced as a result of substantial federal funding, and thus would offer the potential for open access to this research not only to scientists and physicians, but to anyone with access to the Internet.¹²²

Assisting with each stage of open access publishing, from managing submission reviews through online publication and indexing, is a nonprofit advocacy organization, the Public Knowledge Project at the University of British Columbia. In the fall of 2003, this Project announced the availability of a prototype called Open Journal Systems – free open source software for journal management and publishing. Such standardized tools are likely to assist organizations in adopting open access models. The Public Knowledge Project is also applying open access tools in collaborations to develop public information sources and interactive environments, including

EXAMPLES OF OPEN ACCESS SCHOLARLY JOURNALS

BioMed Central, www.biomedcentral.com, was the first scientific publisher to institute an alternative model that offers open access, fully peer-reviewed online journals. Begun in 1999, it recovers costs through author charges, some advertising, and institutional support from universities and foundations.

The Public Library of Science (PLOS), <http://www.plos.org>, conceived by Nobel Laureate Harold Varmus with his colleagues Michael Eisen and Pat Brown, began three years after the introduction of BioMed Central. Funded by a \$9 million grant from the Gordon and Betty Moore Foundation, PLoS is a nonprofit scientific publishing initiative that believes “immediate unrestricted access to scientific ideas, methods, results, and conclusions will speed the progress of science and medicine.” The tradeoff for free access to a vast store of scientific material is a \$1,500 author charge. PLoS was introduced with great fanfare; its first open access journal, *PLoS BIOLOGY*, launched in October 2003, was so popular that it received more than 500,000 hits in a matter of hours, bringing down the server temporarily.¹²³

BioOne, <http://www.bioone.org>, is “an innovative collaboration among scientific societies, libraries, academe, and the commercial sector,” which “brings to the Web a uniquely valuable aggregation of the full texts of high-interest bioscience research journals” that were previously available only in printed form. It is supported by SPARC, the American Institute of Biological Sciences, and the University of Kansas, among others.¹²⁴

Multiliteracies, a project to expand student literacy skills; *Indigenation*, a site focused on Canada’s First Nations (native Americans); *e-commons*, a project that would enable students, journalists, and others to tap into the University’s Faculty of Education resources; and *Vancouver Sun* newspaper links to articles on technology and education.¹²⁵

While promising, many open access publishing experiments carry risks and costs. Some question whether peer review will be as respected and authoritative outside of commercial publications, and whether tenure committees will recognize open access contributions. But as Hess and Ostrom have pointed out, there is no question that the role of the scholar is changing. Scholars worldwide are not only sustaining the resource (the intellectual public domain) but building equity in information access and provision, and creating more efficient methods of dissemination through shared protocols, standards, and rules.¹²⁶

Scholarly Communication: Digital Repositories

A breakthrough for alternative distribution of scholarship came in October 1999 with the development of the Open Archives Initiative (the “OAI”). Funded by the Digital Library Federation, the Coalition for Networked Information, and the National Science Foundation, this initiative works with various information

communities to develop tools for disseminating scholarly papers efficiently. OAI develops and promotes interoperability standards along with standardized descriptive cataloging, in order to provide low-barrier, free access to archives of digital materials.¹²⁷

In 2002, several institutions began using the OAI tool to launch digital repositories. A combination of factors made this possible: rapidly dropping online storage costs; progress in establishing standards for archiving, describing, and preserving electronic publications; and successful demonstrations of servers that supply material in specific academic disciplines like physics. The result has been repositories that allow universities, disciplines, and individuals to share research results and take a more active, collaborative role in modernizing scholarly publishing. A 2002 publication by the Research Libraries Group and OCLC, Inc., *Trusted Digital Repositories: Attributes and Responsibilities*, articulated the characteristics and responsibilities for large-scale, heterogeneous collections, helping digital repositories provide the reliable, long-term access to resources required by their particular communities.¹²⁸

Best known of the new institutional digital repositories is MIT's DSpace, launched in November 2002 with the goal of making MIT faculty members' scholarship widely available. DSpace has encouraged the development of other systems that provide access to the collective intellectual resources of the world's leading research institutions. According to Clifford Lynch, executive director of the Coalition for

EXAMPLES OF DIGITAL REPOSITORIES

DSpace, <http://www.dspace.org>, is "a groundbreaking digital library system to capture, store, index, preserve, and redistribute the intellectual output of a university's research faculty." Developed by MIT Libraries and Hewlett-Packard, DSpace provides articles, data sets, images, and audio and video by MIT professors as well as an open source software platform that enables other institutions to share their faculty members' output. The DSpace Federation, consisting of all the institutions that implement DSpace, will be the governance body for this ambitious online commons.

eScholarship Repository, <http://repositories.cdlib.org/escholarship>, sponsored by the University of California's Digital Library, aims at facilitating and supporting scholar-led innovations in digital access to academic research. Using the Berkeley Electronic Press, <http://www.bepress.com/index.html>, eScholarship also helps faculty members who are seeking alternative publishing mechanisms.

The Connexions Project, <http://cnx.rice.edu>, at Rice University, provides a cohesive body of free, high-quality educational content to anyone in the world through a Content Commons of collaboratively developed material that can be modified for any purpose. The Project also offers open source software to help students, instructors, and authors manage information in the Content Commons.

Networked Information, this development emerged “as a new strategy that allows universities to apply serious, systematic leverage to accelerate changes taking place in scholarship and scholarly communication.” It moves universities “beyond their historic relatively passive role of supporting established publishers,” and enables them to explore “more transformative new uses of the digital medium.”¹²⁹

Like universities, academic disciplines have also created a rich array of repositories. The first, the Los Alamos ArXiv.org, <http://www.arxiv.org>, was begun in 1991 by physicist Paul Ginsparg, in order to provide low-cost access to scientific research before it was peer-reviewed and published in journals. It is an open access, electronic archive and distribution server for research papers in physics and related disciplines such as mathematics, computer science, and quantitative biology. Originally hosted at the Los Alamos National Laboratory, this pioneering effort in free online exchange of scientific information is now maintained by the Cornell University Libraries, with advisors from several subject fields covered by the repository and partial funding from the National Science Foundation. Reciprocity is assured because scientists both depend on the ArXiv for access to others’ work and use it to deposit their own writings. Participation is governed by norms that require authors to submit only those items that are “*of refereable quality*.”¹³⁰ Authors maintain their papers on the ArXiv server, even if they are later published in peer-reviewed journals.¹³¹

The Digital Academic Repository of the University of Amsterdam (UvA-DARE), <http://dare.uva.nl/en>, is a service that automatically creates personal publication lists for scholars as well as a profile of institutional research. It thus provides worldwide access to individual articles as well as the University’s collective contributions to knowledge.

Érudit, www.erudit.org, at the University of Montreal, is a French language institutional digital repository of professional-level scholarly journals, all freely available.

Net Academy Universe, <http://www.netacademy.org>, is a global network of research communities, each of which “accumulates, disseminates, and reviews academic content and activities according to its own organizational principles and quality standards.” The fields of research include media management, electronic markets, and communications. “Its modular architecture enables any interested scientific organization to establish its own NetAcademy,” using its own organizational principles, but following “the old academic ideal: Knowledge is a shared good, [which] is openly discussed.”¹³²

The Digital Library of the Commons (“DLC”), <http://dlc.dlib.indiana.edu>, housed at Indiana University, is a free gateway to the international literature on the commons itself. It contains a Working Paper Archive of author-submitted papers, as well as full-text conference papers, dissertations, pre-prints, and reports. DLC uses “EPrints,” open source software that is compliant with OAI standards and that enables researchers to self-archive their articles efficiently.¹³³

By 2004, the ArXiv.org e-print service was receiving as many as 120,000 queries per day, and included more than 250,000 papers. It had become such a mainstream component of physics publishing that one astrophysicist said he would not consider publishing in any journal without also posting a preprint on the ArXiv.org server.¹³⁴ His attitude is understandable, since astrophysics papers on deposit in ArXiv are cited about twice as often as astrophysics papers that are not, according to a report presented at the American Astronomical Society (AAS) Publications Board in November 2003.¹³⁵

Following the success of ArXiv.org, numerous other digital repositories in specific academic disciplines have been created.

EXAMPLES OF DIGITAL REPOSITORIES IN SPECIFIC ACADEMIC FIELDS

EconWPA, <http://econwpa.wustl.edu>, is devoted to self-archiving and free distribution of working papers in economics.

The Oxford Text Archive, <http://ota.ahds.ac.uk>, makes available at no cost full-text, authorized versions of public domain, historical scholarly materials.

The PhilSci Archive, <http://philsci-archive.pitt.edu>, housed at the University of Pittsburgh, is an electronic free archive for preprints in the philosophy of science.

The New England Law Library Consortium (NELLCO) Legal Scholarship Repository, <http://lsr.nellco.org>, provides a free point of access for working papers, reports, lecture series, workshop presentations, and other scholarship created by law school faculty at NELLCO member law schools, including Cornell, Fordham, and Yale.

Individual authors are also distributing their own scholarly information through personal Web sites or independent repositories. By retaining rights to archival copies of their publications, scholars become part of an international information community that increases access and benefits for everyone. According to Stevan Harnad and other researchers at the University of Loughborough in England, 55% of journals now officially authorize self-archiving, and many others will permit it upon request, demonstrating the dedication of many scholarly publications to promoting rather than blocking research impact.¹³⁶ As with many forms of information, rewards are reaped from increased reading and use, rather than from royalties on commercial sales.

The international scholarly community is increasingly aware that its shared information assets are at risk. Recognizing that collaborative research necessitates open access and communication, groups of scholars and information specialists have begun coordinating strategies to obtain higher joint benefits and to reduce their joint harm from information enclosure. Although many of these collective-action initiatives are still experimental, their success and popularity give hope that scholarly information commons can thrive.

Over many centuries, information communities resided in institutions like universities, schools, and libraries. Today, university presidents such as NYU's John Sexton recognize the importance of moving their institutions toward an information commons model. Sexton believes that universities are now threatened by the tragedy of the commons, and must respond by building a "common enterprise community" as a sanctuary for knowledge creation. One way that universities can serve the broader public interest, Sexton says, is by requiring that publicly funded research discoveries be in the public domain.¹³⁷

MIT has led the way in creating a university-level institutional commons. Its OpenCourseWare project, <http://ocw.mit.edu/index.html>, makes a huge range of course materials freely available to anyone across the globe; this includes course outlines, lecture notes, readings, problems, and solutions. More than 600 of MIT's approximately 950 faculty members participate, with more than 700 courses available online as of spring, 2004.

K-12 public schools should provide a similar shared resource for younger people. Public schools offer youngsters equitable opportunities to achieve and advance, and the skills to participate in all aspects of society, representing a commons similar to the enterprise model of universities. One state that recognizes this is Washington, which has launched a Digital Learning Commons (DLC) that will harness technology to provide all the state's students access to high-quality online courses, digital resources, and learning tools. The project will create a shared infrastructure that will centralize and coordinate a multitude of learning initiatives, in partnership with the rich array of educational and cultural organizations in the state. It will be run by a nonprofit organization, working closely with schools and students to ensure a responsive, equitable resource available to rural and urban residents alike. Initial funding for a "proof of concept" phase of the project comes from private-public partnerships with seed money from the state. When the commons is fully implemented in 2005, school districts and the state will assume the cost of delivering online courses, while a combination of state, federal, and foundation sources will pay for learning resources, technology tools, and course development.¹³⁸

Libraries are quintessential examples of institutional information commons. They embrace, embody, and practice the democratic values that characterize commons. Their mission is to provide communities with open, equitable, sustained access to ideas, and they offer individuals the tools, skills, and spaces necessary to participate in democratic discourse. Starting with free Internet services, libraries have taken a leading role in promoting alternative modes of access to information that transcend DRM, copyright term extension, and other forms of enclosure.

Over the past two decades, academic and research libraries have spearheaded the transition of scholarly communication. Efforts to digitize their own materials are evolving in the U.S. into a collaborative endeavor called the Distributed Open Digital Library (DODL), which will provide universal electronic access to public domain humanities and social science collections from multiple research institutions.¹³⁹ A similar effort in the United Kingdom will extend beyond universities to include some 20 public sector and other organizations that will form a Common Information Environment Group to serve the information needs of a wider audience of learners.¹⁴⁰

In addition to projects to expand access to collections, academic libraries at Indiana University, the University of Arizona, and elsewhere have remodeled their facilities to create physical commons that organize workspace and service delivery around an integrated digital environment, often in spaces adjacent to critical campus units such as the library, the university teaching center, and the computer center. Some of these spaces are called information commons, where disparate resources are brought together by librarians and information technology staff. Others are referred to as learning commons, where students share learning tasks.¹⁴¹

Collaborative, online libraries are also among the proliferating examples of information commons. See the box below for some prominent examples.

EXAMPLES OF INSTITUTIONAL COMMONS: ONLINE LIBRARIES

The Internet Archive/International Children's Digital Library (ICDL), <http://www.icdlbooks.org>, developed by the Internet Archive and the University of Maryland, works with the publishing community to provide a free online collection of international literature for children. The library's primary purpose is to provide access to literature that can enable children to understand the global society in which they live. It has assembled an international community of representatives from national libraries to select and oversee access to materials from their respective countries. Publishers must abide by the terms of the project if they are providing books to the collection. Advising the effort are a group of librarians, authors, publishers, children's advocates, educators, philanthropists, and technologists.¹⁴²

The Baen Free Library, <http://www.baen.com/library> is a free online commons that makes available at no cost novels in electronic format to anyone who wishes to read them with no conditions attached. The purpose of the library is to showcase authors, make it easier for a broader audience to become familiar with their work, and demonstrate that open access to full-text stimulates a net gain in book sales.

The Distributed Library Project, <http://www.communitybooks.org>, is an experiment in sharing information and building community in the San Francisco Bay Area. Library users are encouraged to create an account and then list the books and videos that they own, making them available to other participants in the project.

Ibiblio, <http://www.ibiblio.org>, is a heavily used conservancy of freely available information in the fields of music, literature, art, history, science, politics, and cultural studies. A collaboration between the Center for the Public Domain and the University of North Carolina-Chapel Hill, Ibiblio encourages users not only to view and utilize the collection and free software, but to critique and expand it, and to create and manage a new collection in their own area of interest.

Finally, the Digital Promise Project, co-chaired by Newton Minow and Lawrence Grossman, is promoting the creation of a Digital Opportunity Investment Trust (“DO IT”), a nonprofit, nongovernmental agency that would deploy the Internet and other new information technologies to ensure public access to knowledge and learning-across-a-lifetime in the sciences and humanities. DO IT would also stimulate public and private sector research into the development and use of new learning techniques and encourage digitization of cultural resources held by libraries, museums, and universities, with funding dedicated by Congress from the proceeds of spectrum auctions. Legislation was introduced in November 2003 to support this effort.¹⁴³

Subject Matter Information Commons

Beyond the cross-disciplinary archiving and publishing efforts evolving among scholars and cultural institutions, information communities worldwide have developed a broad array of projects that focus on particular subjects. These efforts incorporate many of the characteristics of commons. Examples range from civic engagement to cultural exchange, and from collaborative publishing to dissemination of specialized resources. See the box on pages 28–29 for a sampling of these projects.

In addition to the many ongoing projects, two initiatives that, as of spring 2004, were still in the design stage, demonstrate the range of possibilities for subject-matter commons. The BBC Creative Archive, a project under development by the British Broadcasting Corporation, plans to make the contents of its vast archive available to the public so long as any re-use is for noncommercial purposes. The BBC Creative Archive will enable not only the British but people across the globe to cultivate this national resource.¹⁴⁴

The Galiwinku Knowledge Centre, established to preserve and revive Australia’s indigenous cultures, is creating an elaborate digital database of words, music, and dance steps representing the entire intellectual system of the people of Galiwinku on Elcho Island, off the northeast coast of Australia. The project is probably the world’s first software system being tested and perfected by indigenous people seeking to map their knowledge.¹⁴⁵



EXAMPLES OF SUBJECT MATTER COMMONS

The Allen Brain Atlas Project, <http://www.brainatlas.org>, was created with a donation of \$100 million from Microsoft co-founder Paul Allen. The open access, collaborative, public domain Allen Brain Atlas will illustrate the functional anatomy of the brain and overlay structural imagery of the brain with specific details about the locations and functions of active genes on an unprecedented scale.

The George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES), <http://www.nees.org>, links together 15 sites to act as a single virtual earthquake engineering laboratory that enables experimentation, data analysis, simulations, theory formulation and testing, and education about earthquakes. Funded by the National Science Foundation, this scientific “collaboratory” uses the “Internet2 Commons,” a super-fast network consisting of 205 member institutions.¹⁴⁶

The Berkman Center Commons at Harvard University, <http://cyber.law.harvard.edu/berkmancommons>, is a collection of creative works made available by people associated with the Center. The works are available on the Internet for use on open, generous terms through Creative Commons licenses.

The OYEZ Supreme Court Multimedia Archives, <http://www.oyez.org/oyez/> frontpage, converts recordings of Supreme Court hearings to MP3 format, permitting offline listening and sharing through the same peer-to-peer software that is used to swap music and movies. OYEZ has been based at Northwestern University since 1989; this new project is building a digital commons of hearings that are available at no charge, and can be shared as long as OYEZ is credited and use is limited to noncommercial purposes.

Project Vote Smart, <http://www.vote-smart.org>, is a citizens’ organization formed to provide unbiased, nonpartisan, accurate, and comprehensive information for voters. In addition to profiles of elected officials and candidates, PVS monitors the status of major federal legislation and posts calendars for the U.S. Senate and House of Representatives.

The Democracy Design Workshop, <http://www.nyls.edu/pages/108.asp>, is an interactive open-source software program that fosters the exchange of information about civic engagement and democratic governance worldwide. Developed by the Democracy Design Workshop at New York Law School and the Information Society Project at Yale Law School, and supported by the Rockefeller Brothers Fund, the Council of Europe, and America Speaks, this project enables networking among communities interested in democratic governance structures and the documentation of best practices for civic participation.

Culture Online, <http://www.cultureonline.gov.uk>, sponsored by the government of the United Kingdom, is an arts and education initiative aimed at enlivening the school curriculum and adult learning. Working collaboratively, Culture Online forges connections between new digital technology and a variety of cultural institutions, and thus opens up British cultural resources to the world.

E-Democracy Public Commons, <http://www.e-democracy.org/do/commons.html>, helps communities create active “online public commons” for their towns and regions, as well as national nonpartisan online discussion on public issues. Participants are encouraged to assess their communities, draw up a charter and rules for a forum they wish to create, and then set up a nonpartisan, nonprofit working group to host it, while assigning each member a specific management task. Organizers of this effort work collaboratively with academics on research about civic engagement.

3 Rivers Connect, <http://www.3rc.org>, is creating an information commons for the Pittsburgh region to facilitate the flow of useful information among public, civic, educational, and economic development agencies throughout southwestern Pennsylvania. This nonprofit collaborative undertaken by a diverse group of community leaders is coordinating community technology efforts and presenting them as a laboratory for demonstrating how an information commons can empower grassroots participation in democracy.

Net Ring, <http://www.geocities.com/lefroglady/knitring.html>, is a collaborative exchange for knitters, created on the Internet in 1998 to reflect the historical importance of knitting and contribute to the continued growth and vibrancy of the craft. The purpose of a net ring is to link Web sites with a similar theme, this one linking sites that offer free knitting patterns. The result is an active global knitting circle that forms a community of practice not restricted by time or geography.

Berklee Shares, <http://www.berkleeshares.com>, at the Berklee College of Music, offers online lessons for download and sharing. Topics include composing, producing, engineering, remixing, and performing. Musicians are encouraged to swap audio and video clips of course material over peer-to-peer networks. Content is covered by Creative Commons licenses.

The Canadian National Institute for the Blind Digital Library, <http://webcluster.cnib.ca/AuthFiles/login.aspx?ReturnUrl=%2fDefault.aspx>, contains more than 10,000 audio, text, and Braille titles, and current editions of more than 40 national and community newspapers from across Canada, plus access to the full-text versions of thousands of magazines and databases. The library, designed to work with major adaptive technology products including screen-reading programs and Braille keyboards, offers a Children’s Discovery Portal that provides visually impaired children access to online games, books, homework help, and chats with other visually impaired children.

Access to Global Online Research in Agriculture (“AGORA”), <http://www.aginternetwork.org/en>, offers students and academics in the world’s poorest countries free or low-cost access to online scientific information on food and agriculture. Sponsored by the U.N. Food and Agriculture Organization and a range of public and private sector partners including libraries, foundations, and publishers, this initiative responds to the unfilled demand for scientific literature in developing countries to improve health, nutrition, and education of the world’s poor.

PRINCIPLES AND CHARACTERISTICS OF INFORMATION COMMONS

The examples of information commons described in this report have similar characteristics. They are collaborative. They offer shared spaces, real and virtual, where communities with common interests and concerns gather. They take advantage of the networked environment to build information communities, and they benefit from network externalities, meaning the greater the participation, the more valuable the resource. They are interactive, encouraging discourse and exchange among their members. Many are free or low cost. Their participants often contribute new creations after they gain and benefit from access. These commons enhance both human and social capital. Their governance is shared, with rules and norms that are defined and accepted by their constituents. They incorporate democratic values. Free expression and intellectual freedom prevail.

Many of these characteristics of information commons are consistent with the principles developed by public interest groups in the late 1980s and early 1990s as they tried to sort through the many disputes about information enclosure. To cope, these groups began developing principles that served as a baseline for evaluating potential policy changes. Among the first to draft such principles were the American Library Association and the Telecommunications Roundtable, an alliance of public interest groups in Washington that was active in the early 1990s.¹⁴⁷

In 1993, the Aspen Institute hosted a working meeting of industry, academic, foundation, and public interest representatives to express some of these “first principles” in the areas of communication, privacy, and information policy. Aspen’s Communication and Society Program published the outcome of these discussions as *Toward An Information Bill of Rights and Responsibilities*.¹⁴⁸ Today, numerous organizations around the globe have drafted similar principles and statements. The Appendix lists many of them, along with Web links to their documents.

*Libraries are
quintessential examples
of institutional
information commons.*

Among the most common factors highlighted in these statements are free expression and the right to communicate and gain access to information. Other commonly cited goals are diversity of content, preservation of culture, open access, protection of the public domain, bridging the digital divide, use of open source software, privacy protection, participation in democratic processes, and structural regulation of the mass media to prevent unchecked consolidation and power. While few of these statements refer specifically to commons, most support the values outlined in this report.

Of the organizations listed, technology and Internet groups have a strong focus on technical issues and the right to communicate. One example is the Association for Progressive Communications, which offers a comprehensive “Internet Rights Charter.”¹⁴⁹ Another is the UK-based *Manifesto for Online Communities*, which states that the Internet should “enhance rather than restrict democracy, [and] enable us to be active citizens.”¹⁵⁰

Groups that advocate stronger political participation, such as Greater Democracy and the Center for Digital Democracy, echo this concern for civic engagement.¹⁵¹ Media advocacy organizations stress free expression, accessibility, multiple competing channels of information, diversity of sources and voices, the public domain, and fair allocation of the broadcast spectrum. Although international organizations are more vague and generalizing in their public statements, they also proclaim the inherent communication rights of citizens. Excerpts from the statement passed by civil society groups at the World Summit on the Information Society in December 2003 are a good example:

Access to information and the means of communication as a public and global commons should be participatory, universal, inclusive and democratic. Universal access to information that is essential for human development must be ensured. ... The regulatory and legal framework in all information and communication societies must be strengthened to support broad-based sharing of technologies, information, and knowledge, and to foster community control, respectful of human rights and freedoms.¹⁵²

Finally, librarians and publishers focus extensively on free expression, open access, and affordability. Of this group, the American Library Association has updated its earlier document that now offers a comprehensive statement related to networking principles as well as another specifically addressing information commons.¹⁵³ The ALA's 2001 roundtable, "The Information Commons, New Technology, and the Future of Libraries," established 12 principles or discussion points to be used in developing the information commons, among them that "information is a key resource that has a central role in our development as citizens and human beings"; that "some elements of the commons are embodied in ideas such as fair use and the public domain"; and that "we might understand the commons as a 'place' or 'space,' but we should also understand the commons as a collection of processes for meeting the information needs of our societies."

Finally, says the ALA:

Among the other institutions we might see as part of the commons are: museums, archives, and other resource centers; cultural heritage centers; religious organizations; nonprofit and social service organizations; unions; public interest broadcasters; even commercial organizations may play a role in the information commons to the extent that they benefit from and promote access to information outside strict market limits.¹⁵⁴



III. THE FUTURE OF THE INFORMATION COMMONS

Organizations large and small are developing new paradigms for creating and disseminating their information assets. These efforts incorporate many of the characteristics of commons. Yet they may not satisfy everyone's expectations for a more democratic information society. Instead, many of these commons are likely to raise the same tensions that have surfaced in other democratic organizations.

For example, commons that offer characteristics like free and open access for small, trusting homogeneous communities committed to reciprocity may end up discouraging diversity. Likewise, more diverse, creative, and freedom-loving commons, like the open-access spaces on the Internet, may engender low levels of trust and the proliferation of free-riders who pollute the common pool with spam and viruses. Furthermore, some commons may generate policies or sanctions that undermine rather than enhance individual liberties. Hence, it is unlikely, as Peter Levine has suggested, that any information commons will meet all of the desirable criteria at once.¹⁵⁵

Developing, sustaining, and governing information commons will require significant investment in infrastructure and content to pay for start-up and ongoing costs. While the public may gain more free or low-cost access, someone must pay to sustain new information commons. Many of the commons cited in this report are supported by foundations and other grantmaking agencies. At some point, these projects will need to generate revenues to replace the grants that now cover costs. For circumstances like open access publishing, the burden of production expenses is shifting from purchasers to creators. Such transitions require capital for starters, and then new streams of revenue for sustainability.

For libraries, low-cost journals and digital archives are welcome. But libraries already face serious budget constraints in paying for their long-term commitments, let alone investment in new ventures. At the same time, authors need incentives and rewards if they are to favor new publishing ventures that may demand high publication fees. Institutions like universities will need to redirect resources if they are to become publishers as well as consumers of their faculty's scholarship.

At stake in today's debates about the future of information access is not only the availability and affordability of information, but also the very basis on which citizens' information needs are met. The new information infrastructure must ensure free spaces that are filled by educational and research institutions, libraries, nonprofits, governmental organizations, and information communities committed to promoting and fulfilling the needs of citizens. People need safe gathering places where they can share interests and concerns, find information essential to civic involvement, and connect with fellow citizens. Neutrality will not work; the stakes are very high – namely, a democratic way of life that depends on an informed electorate.

To meet the challenge of information access in the digital age, public interest advocates must join together to amplify their voices and extend their reach. Only collective unified action with shared decision-making can address their common concerns. In short, what is needed is a new movement comparable to the movement

for environmental protection in the last two decades of the 20th century. As James Boyle observes in the related context of the public domain:

In one very real sense, the environmental movement *invented* the environment so that farmers, consumers, hunters, and birdwatchers could all discover themselves as environmentalists. Perhaps we need to *invent* the public domain in order to call into being the coalition that might protect it.¹⁵⁶

Boyle advocates “Information as an Ecosystem,” and recommends creating coalitions of people who are currently engaged in individual struggles but have little sense of the larger context. He is joined by a growing list of practitioners, including librarians and self-publishers, who recognize the need to identify and mobilize a broad array of individuals, information communities, and organizations concerned with the production and distribution of knowledge and ideas – people often inexperienced at working in concert to promote common concerns. The voices needing amplification range from authors, journalists, artists, musicians, scientists, and scholars to independent publishers, lawyers, librarians, public interest groups, readers, listeners, and viewers of information.

While a consensus about the need to create and sustain information commons is emerging, the challenge is to identify and bring together the voices of these disparate groups and individuals who may or may not have experience organizing advocacy campaigns. Building coalitions to counter the influence of well-financed industry groups will require extensive organizing, fund-raising, and grassroots action. Those committed to building information commons must look far beyond the normal sources for allies. Organizers need to find common threads to tie various constituents together, and to recognize that allies on some issues may become opponents on others – for example, publishers and librarians, who coalesce in support of First Amendment causes but approach copyright and fair use from very different perspectives. Furthermore, potential partners may feel threatened by shifts in a market that could reduce or undermine their income and traditional support mechanisms.

Building the information commons does not mean a total rejection of the for-profit media industry.

Many different public interest communities now recognize that information access is critical to their future. For example, the arts community has a particular interest in the information debate, particularly as it relates to file-sharing and circumvention of DRM techniques.¹⁵⁷ Lawsuits initiated by industry groups under the DMCA and traditional copyright law have galvanized support for finding alternative solutions that offer creators more public exposure without threatening litigation against those who sample and build on previous works (including fans). Another group is scholars, who have made significant strides in carving out new territory for producing and sharing their intellectual assets, although many within the academy are still unaware of the crisis and their role in solving it.

Educators are also joining the campaign to increase public access to information, but they rely heavily on other allies to lead the charge. As frequent users of free and low-cost materials, including items in the public domain, members of this community can gain a great deal by engaging more directly in the discourse about the commons

– a discourse that can reinforce the vital role of schools in building community and providing opportunity for all. Yet another constituency worth mobilizing is software creators, who have excelled at sharing tools and pioneering the concept of open source.

If everyone is to be ensured free and open access to information, advocates must change the terms of the debate by focusing on what is needed, not just on what is unacceptable. They must articulate why an information commons can advance civil society and democratic participation. They must inform themselves about a broad array of complex issues and the various perspectives held by players on all sides. Moreover, they must undertake research that demonstrates the contributions of open public access to the advancement of science and the arts, map public opinion, and compile narratives about the positive effects of access to information and the negative impact when access is denied.

Advocates must also articulate why the positive economic value of the commons outweighs potentially negative impacts on the market. Good examples and best practices abound, demonstrating that commons are a viable, effective alternative to market-driven or government-based approaches to information access. Documenting these models and sharing them widely will help tell a story that resonates with policymakers, the media, and the general public.

With a highly diffused information environment, public interest advocates must seek ways to unify their voices behind a common agenda. And they must galvanize foundations and other potential funders if they are to amass the resources needed to launch an effective “environmentalism for the Net” movement. The idea of the commons can only become reality with both substantial financial backing and political will.

Beyond advocacy and research, champions of the commons will need good governance models that ensure a viable structure and a set of rules that will transcend the tragedy of the commons described by Hardin. This is particularly true for those concerned with fortifying the public domain and ensuring its survival into the future. They will also need replicable technological solutions for managing electronic resources that rely on widely accepted standards in order to ease the burden for those who wish to offer alternatives but are ill-equipped to design their own technological solutions. Peer production ensures broader participation but it also requires a robust platform where contributors and users can exchange information in familiar, sustainable ways. Contributors must follow generally accepted standards for the mark-up, description, and archiving of content if their efforts are to succeed.

Finally, it is important to recognize that building the information commons does not mean a total rejection of the for-profit media industry. As Frederick Emrich, the editor of the ALA’s info-commons Web site, points out: “Commercial uses of information serve a vital role in ensuring that new ideas are produced. So long as commercial uses of information are balanced with effective public access to information, there is good reason to see the information commons and information commerce as mutually beneficial aspects of one system of managing ideas.”¹⁵⁸ In the 21st century, no single model for creating and distributing information is likely to emerge. But the information commons will provide a useful alternative that ensures a meaningful role for users and creators alike.

Now is the time to create alliances that will reclaim the technological future. Decisions are being made every day that will affect how information is produced and disseminated for years to come. Without access to a technologically sophisticated information commons in every community, many people will be left behind in the information age. If we are to spark innovation, revive civic communities, and build democratic participation in America, we must advocate for new information commons. Otherwise, we will endanger our most precious assets in a democratic society – our rights of free speech, inquiry, and self-governance.

POLICY RECOMMENDATIONS AND STRATEGIES

Create a movement similar to environmentalism promoting the information commons:

- ❖ Focus on what we are fighting for, not just against.
- ❖ Emphasize the public interest in information access.
- ❖ Highlight successes; document problems and chilling effects of enclosure; identify examples of harm caused by technological controls and digital rights management.
- ❖ Educate concerned individuals and groups, the press, and the public.
- ❖ Organize coalitions based on common interests among disparate groups that cut across traditional alliances.
- ❖ Encourage the development of robust information communities.
- ❖ Seek funding for demonstration projects and ongoing support.

Apply common property resource models to the information sphere:

- ❖ Spell out common property resource economic models that elevate the value of shared access.
- ❖ Involve information communities in the design, creation, governance, and management of information resources.

Support legislation that encourages information sharing and oppose legislative, regulatory, and judicial actions that undermine opportunities to participate in the information society:

- ❖ Promote legislation that ensures public access to public research.
- ❖ Oppose new copyright laws and regulations that limit the public's access rights.

Develop, make available, and adopt open source software, content, standards, and best practices:

- ❖ Publish in open access publications.
- ❖ Sign only those licenses and contracts that enable open access and guarantee user rights such as fair use and “first sale” sharing of copyrighted works.
- ❖ Encourage peer production of information.

Apply open access, digital repository, and other practices developed by scholars more widely.

Value the public domain:

- ❖ Protect it as a sanctuary against enclosure.
- ❖ Develop advocacy programs, governance structures, and new laws that ensure it is well preserved, governed, managed, and valued.
- ❖ Resist attempts to apply technological measures that control access to ideas.

APPENDIX

POLICIES AND PRINCIPLES RELATED TO INFORMATION AND COMMUNICATIONS TECHNOLOGIES

(all Web sites accessed May 2004)

Technology/Internet Organizations

A Manifesto for Online Communities, <http://www.partnerships.org.uk/cyber/manifest.htm>

Aspen Institute, Communication and Society Program, *Toward an Information Bill of Rights and Responsibilities*, Washington, DC: Aspen Institute, 1995

Association for Progressive Communications, *APC Internet Rights Charter*
<http://www.apc.org/english/rights/charter.shtml>

Communication Rights in the Information Society,
<http://www.crisinfo.org/live/index.php?section=5&subsection=0&doc=1>

Global Internet Policy Initiative, *Policy Principles – The ICT Framework*,
<http://www.gipiproject.org/principles>

IP Justice, *Principles*, <http://www.ipjustice.org/principles.shtml>

New America Foundation and Public Knowledge, “A Return to First Principles,” in *Saving the Information Commons: A New Public Interest Agenda in Digital Media*, by David Bollier and Tim Watts, May 2002, pps. 67–69, http://www.newamerica.net/Download_Docs/pdfs/Pub_File_866_1.pdf

People’s Communication Charter, <http://www.pccharter.net/charteren.html>

Platform for Communication Rights, <http://www.comunica.org/platform/index.htm>

Somos@Telecentros Network, <http://www.tele-centros.org/english/index.html>

TechFunders Collaborative, *Principles*, <http://www.techfunders.org/principles.html>

Wireless Commons Manifesto, http://www.sarai.net/journal/03pdf/366_367_wirelessmanifesto.pdf

Democracy and Mass Media Advocacy Organizations

Campaign for Press and Broadcasting Freedom (CPBF), *CPBF Manifesto: Shaping the Democratic Vision*, <http://www.cpbfdemon.co.uk/manifesto.htm>, and
Campaign Statement, <http://www.presscampaign.org/statement.htm>

Center for Digital Democracy, *Declaration of Digital Democracy*,
<http://www.democraticmedia.org/issues/decDigitalDemocracy.html>, and
Cable Broadband and Beyond: Open Access Principles for Public Interest Programming,
<http://www.democraticmedia.org/issues/openaccess/principles.html>

Computer Professionals for Social Responsibility (CPSR), *The Seattle Statement: Moving the Democratic Communication Agenda Forward*,
<http://www.cpsr.org/publications/newsletters/issues/2000/Summer2000/seattle1.html>

Consumer Federation of America, *et al.*, *Democratic Discourse and the Public Interest: Media Ownership Policies and Digital Communications Networks*, <http://www.consumerfed.org/principles.pdf>

Forum on Globalisation and Cultural Diversity: The Challenge to the Audiovisual Industry, *Valencia Statement on Globalisation and Cultural Diversity*, <http://www.audiovisualforum.net/manifest/index.htm>

Greater Democracy, <http://www.greaterdemocracy.org/about.html>

The MacBride Round Table on Communication, *Many Voices, One World: Conclusions and Recommendations*, <http://www2.hawaii.edu/~rvincent/mcbcon2.htm>

Media Alliance, *A Call for a Communications Bill of Rights*, <http://www.media-alliance.org/mediafile/20-1/kidd.html>

Media Channel, *A Declaration of Media Independence*, <http://www.mediachannel.org/views/dissector/declaration.shtml>

Voices 21, *A Global Movement for People's Voices in Media and Communication in the 21st Century*, <http://www.comunica.org/v21/statement.htm>

Libraries/Publishing/Print Media Organizations

American Library Association, *Principles for the Networked World*, <http://www.ala.org/ala/washoff/washpubs/principles.pdf>, and *Principles for an Effective Information Commons*, <http://info-commons.org/arch/1/icwg.html>

Association of College and Research Libraries, *Principles and Strategies for the Reform of Scholarly Communication*, <http://www.ala.org/ala/acrl/acrlpubs/whitepapers/principlesstrategies.htm>

International Federation of Library Associations and International Publishers' Association, *Joint IFLA/IPA Statement on Freedom of Expression on the Internet*, <http://www.ipa-ue.org/librarians/relationship/Joint%20Statement%2021%20August%202003.htm>

The Wellcome Trust, *Scientific Publishing: A Position Statement in Support of Open Access Publishing*, <http://www.wellcome.ac.uk/en/1/awtvispolpub.html>

World Organizations

Japan Government, *Okinawa Charter on Global Information Society*, <http://www.dotforce.org/reports/it1.html>

UNESCO, *UNESCO's Contribution to the World Summit on the Information Society* (Geneva 2003 and Tunis 2005), <http://unesdoc.unesco.org/images/0012/001295/129531e.pdf>, and *Toward Knowledge Societies*, http://portal.unesco.org/ci/ev.php?URL_ID=13201&URL_DO=DO_TOPIC&URL_SECTION=201

World Summit on the Information Society, Civil Society Declaration, *Shaping Information Societies for Human Needs*, http://wsis-online.net/smsi/file-storage/download/WSIS-CS-Dec1-08Dec2003-eng1.htm?version_id=313554#accesstoinfo

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(all URLs accessed 3-4-04)

¹ Ronald J. Oakerson, "Analyzing the Commons: A Framework," in *Making the Commons Work: Theory, Practice, and Policy*, Daniel W. Bromley, ed., San Francisco: Institute for Contemporary Studies, 1992, p. 41.

² Lewis Friedland and Harry C. Boyte, "The New Information Commons: Community Information Partnerships and Civic Change," University of Minnesota Hubert Humphrey Institute, Center for Democracy and Citizenship, Jan. 2000, <http://www.publicwork.org/pdf/workingpapers/New%20information%20commons.pdf>.

³ See David Bollier, "The Missing Language of the Digital Age: The Commons," *The Common Property Resource Digest*, no. 65 (June 2003): 1-4, <http://www.indiana.edu/~iascp/E-CPR/cpr65.pdf>; David Bollier, *Public Assets, Private Profits: Reclaiming the American Commons in an Age of Market Enclosure*, Washington, DC: New America Foundation, 2001, http://www.newamerica.net/Download_Docs/pdfs/Pub_File_650_1.pdf; David Bollier and Tim Watts, *Saving the Information Commons: A New Public Interest Agenda in Digital Media*, Washington, DC: New America Foundation and Public Knowledge, 2002, http://www.newamerica.net/Download_Docs/pdfs/Pub_File_866_1.pdf; David Bollier, *Silent Theft: The Private Plunder of Our Common Wealth*, NY: Routledge, 2002.

⁴ Judge Alex Kozinski, dissenting in *White v. Samsung Electronics America Ltd.*, 989 F.2d 1512, 1513 (9th Cir. 1993).

⁵ See Jorge Reina Schement and Terry Curtis, *Tendencies and Tensions of the Information Age*, New Brunswick, NJ: Transaction, 1995, p. 6, and the timeline of the historical evolution of information, pp. 257-278; World Information.Org, World Infostructure, *Timeline of Communications*, <http://world-information.org/wio/infostructure/100437611796/100438659725?opmode=contents>.

⁶ James Madison, *Letter to W. T. Berry*, Aug. 4, 1822, in *Letters and Other Writings of James Madison*, 4 volumes, Philip R. Fendall, ed., Philadelphia: Lippincott, 1865, III, p. 276.

⁷ *The Life and Times of Benjamin Franklin*, The Franklin Institute Online, <http://sln.fi.edu/franklin/timeline/timeline.html>. On circulating libraries in England and their contribution to the spread of reading and knowledge, see Diane Zimmerman, "Authorship Without Ownership: Reconsidering Incentives in a Digital Age," *DePaul L. Rev.*, vol. 52, pp. 1121, 1131 (2003).

⁸ U.S. Constitution, Art. I, §8, cl. 8.

⁹ See Schement and Curtis, *supra* n. 5; James R. Beniger, *The Control Revolution*, Cambridge, MA: Harvard U. Press, 1986; James R. Beniger, "Origins of the Information Society," *Wilson Library Bulletin*, vol. 61, #9 (Nov. 1986): 12-19; Jorge Reina Schement and Leah A. Lievrouw, eds., *Competing Visions, Complex Realities: Social Aspects of the Information Society*, Norwood, NJ: Ablex, 1988: 33-45.

¹⁰ Communications Act of 1934, 47 U.S. Code §§151-614.

¹¹ The "public interest" is not defined in the 1934 law, the Telecommunications Act of 1996, or other federal statutes that use the term. Although the nature of the public interest may be difficult to determine (see, e.g., Brian M. Barry, "The Use and Abuse of 'The Public Interest,'" in *Nomos V, The Public Interest*, Carl J. Friedrich, ed., NY: Aldine-Atherton, 1962, p. 203), one scholar defines a public interest policy as one that, "at least in the long run, affects everyone in an equally beneficial manner, receives

public support through a principle of unanimity, and has costs that are widely and equally shared.” William C. Dennis, “The Public and Private Interest in Wilderness Protection,” *Cato Journal*, vol. 1, #2 (Fall 1981), <http://www.cato.org/pubs/journal/cj1n2-3.html>.

¹² 47 U.S. Code §151. On the Communications Act of 1934, particularly its public interest and universal service provisions, see Max D. Paglin, *A Legislative History of the Communications Act of 1934*, NY: Oxford U. Press, 1989; Robert McChesney, *Telecommunications, Mass Media, and Democracy: The Battle for Control of U.S. Broadcasting, 1928-1935*, NY: Oxford U. Press, 1993; and Milton Mueller, *Universal Service: Competition, Interconnection, and Monopoly in the Making of the American Political System*, Cambridge, MA: MIT Press, 1997.

¹³ Roger Summit, “Reflections on the Beginnings of Dialog: The Birth of Online Information Access,” *Dialog Corporation History*, June 2002, <http://support.dialog.com/publications/chronolog/200206/1020628.shtml>; see also Christine Borgman, *From Gutenberg to the Global Information Infrastructure: Access to Information in the Networked World*, Cambridge, MA: MIT Press, 2000.

¹⁴ Quoted in John N. Berry III, “Free Information and the IIA,” *Library Journal*, vol. 100, #8 (Apr. 15, 1975), p. 795.

¹⁵ The privatization policy was promulgated by the Office of Management and Budget through its Circular A-130, “The Management of Federal Information Resources,” 50 *Federal Register* 52730-51 (Dec. 24, 1985). When the policy was revised in 1993, it eliminated the phrase “maximum feasible reliance on the private sector.” Office of Management and Budget, “The Management of Federal Information Resources, Circular A-130 Revised,” 58 *Federal Register* 36070-86 (July 2, 1993).

¹⁶ Peter Hernon and Charles McClure, *Federal Information Policies in the 1980s: Conflicts and Issues*, Norwood, NJ: Ablex, 1987. See also Charles McClure, Peter Hernon, and Harold Reylea, eds., *United States Government Information Policies: Views and Perspectives*, Norwood, NJ: Ablex, 1989; Toby McIntosh, *Federal Information in the Electronic Age: Policy Issues for the 1990s*, Washington, DC: Bureau of National Affairs, 1990.

¹⁷ Walter Bolter, *Telecommunications Policy for the 1980s: the Transition to Competition*, Englewood Cliffs, NJ: Prentice-Hall, 1984. See also Barry G. Cole, ed., *After the Breakup: Assessing the New Post-AT&T Divestiture Era*, NY: Columbia U. Press, 1991; and Steve Coll, *The Deal of the Century: The Breakup of AT&T*, NY: Touchstone, 1986.

¹⁸ See Edward S. Herman and Robert McChesney, *The Global Media: the New Missionaries of Corporate Capitalism*, Washington, DC: Cassell, 1997; Patricia Aufderheide, Erik Barnouw, et. al., *Conglomerates and the Media*, NY: New Press, 1997; André Schiffrin, *The Business of Books: How International Conglomerates Took Over Publishing and Changed the Way We Read*, NY: Verso, 2000.

¹⁹ For more on mergers and acquisitions in the computer and networking fields, see John C. Dvorak, *An Insider's Look at the Computer Industry*, Berkeley, CA: Osborne McGraw-Hill, 1994; Jerry Ellig, ed., *Dynamic Competition and Public Policy: Technology, Innovation, and Antitrust Issues*, NY: Cambridge U. Press, 2001; and Michael Cusumano and David B. Yoffie, *Competing on Internet Time: Lessons from Netscape and Its Battle with Microsoft*, NY: Free Press, 1998.

²⁰ Telecommunications Act of 1996, 110 Stat. 56 (1996); see Patricia Aufderheide, *Communications Policy and the Public Interest: the Telecommunications Act of 1996*, NY: Guilford Press, 1999; Reed Hundt, *You Say You Want a Revolution: A Story of Information Age Politics*, New Haven: Yale U. Press, 2000.

²¹ See C. Edwin Baker, *Media, Markets, and Democracy*, Cambridge, UK: Cambridge U. Press, 2002;

Mark Cooper, “Abracadabra! Hocus-Pocus! Making Media Market Power Disappear with the FCC’s Diversity Index,” Washington, DC: Consumer Federation of America, July 2003, <http://www.consumersunion.org/abrafinal721.pdf>; Mark Cooper, *Media Ownership and Democracy in the Digital Information Age: Promoting Diversity with First Amendment Principles and Market Structure Analysis*, Palo Alto, CA: Center for Internet & Society, Stanford Law School, 2003, p. 21, <http://cyberlaw.stanford.edu/blogs/cooper/archives/mediabooke.pdf>; Robert McChesney, *Rich Media, Poor Democracy*, Urbana, IL: U. of Illinois Press, 1999; Peter DiCola and Kristin Thomson, Future of Music Coalition, *Radio Deregulation: Has It Served Citizens and Musicians?: A Report on the Effects of Radio Ownership Consolidation Following the 1996 Telecommunications Act*, Washington, DC: Future of Music Coalition, Nov. 2002, <http://www.futureofmusic.org/research/radiostudy.cfm>; Consumer Federation of America/Consumers Union, *Lessons From the 1996 Telecommunications Act: Deregulation Before Meaningful Competition Spells Consumer Disaster*, Washington, DC: Consumers Union, Feb. 2001, <http://www.consumersunion.org/telecom/lessondc201.htm>. For arguments that the 1996 Act and deregulation have not resulted in more top-down media control, see Benjamin M. Compaine, *Who Owns the Media: Competition and Concentration in the Mass Communications Industry*, 3rd ed. Mahwah, NJ: L. Erlbaum Associates, 2000; Benjamin M. Compaine, “Domination Fantasies: Does Rupert Murdoch Control the Media? Does Anyone?,” *Reason*, Jan. 2004, <http://www.reason.com/0401/fe.bc.domination.shtml>; Gerald W. Brock, *Telecommunications Policy for the Information Age: From Monopoly to Competition*, Cambridge, MA: Harvard U. Press, 1998; Thomas W. Hazlett, “Economic and Political Consequences of the 1996 Telecommunications Act,” *Regulation*, vol. 23, #3 (Fall 2000): 36-45, <http://www.cato.org/pubs/regulation/regv23n3/hazlett.pdf>; Jonathan A. Knee, “Should We Fear Media Cross-Ownership?” *Regulation*, vol. 26, #2 (Summer 2003): 16-20, <http://www.cato.org/pubs/regulation/regv26n2/v26n2-3.pdf>.

²² Quoted from the publisher’s blurb for Ben Bagdikian, *The Media Monopoly*, 6th ed., Boston: Beacon Press, 2000; see also Laurence Zuckerman, “Media Megadeal: The Power: Questions Abound as Media Influence Grows for a Handful,” *New York Times*, Jan. 13, 2000: C6.

²³ Bagdikian, *supra* n. 22.

²⁴ FCC, 2002 Biennial Regulatory Review, 68 *Federal Register* 46286 (Aug. 5, 2003). This rulemaking increased any single company’s permissible national TV market share from 35% to 45%, eased restrictions on the number of TV stations one company can own in a single market, and repealed a ban on one company owning both a newspaper and a broadcast station in most markets. Congress later reduced the 45% market share figure to 39%. In September 2003, in a case brought by the Media Access Project and other public interest groups, a federal appeals court issued a preliminary injunction blocking the rule changes. *Prometheus Radio Project v. FCC*, No. 03-3388 and consolidated cases (3^d Cir., argued Feb. 11, 2004). On media ownership, see Lexis Nexis, *Corporate Affiliations: Who Owns Whom*, New Providence, N.J.: LexisNexis Group, 2003; Columbia Journalism Review, *Who Owns What*, <http://www.cjr.org/tools/owners>; The Center for Public Integrity, “Media Tracker,” www.openairwaves.org; and Mark Crispin Miller, “The Big Ten Media Conglomerates,” *The Nation*, vol. 274, #1, (Jan. 7/14, 2002): 26-31.

²⁵ Mathew Hindman and Kenneth Neil Cukier, “Measuring Media Concentration Online and Offline,” Paper Presented at the Ford Foundation Conference on Media Diversity, Dec. 15-16, 2003, <http://www.cukier.com/writings/webmedia-jan04.htm>.

²⁶ “About the Well,” 2002, <http://www.well.com/aboutwell.html>; see also Howard Rheingold, *The Virtual Community, Homesteading on the Electronic Frontier*, Reading, MA: Addison-Wesley, 1993, <http://www.rheingold.com/vc/book/intro.html>; “Gopher Protocol,” *Wikipedia*, http://en.wikipedia.org/wiki/Gopher_protocol.

²⁷ *Reno v. American Civil Liberties Union*, 521 U.S. 842, 870 (1997) (quoting in part from the lower court decision). Mail exploders is another term for listservs.

²⁸ David Bollier, "Artists, Technology and the Ownership of Creative Content," Center for the Creative Community, Nov. 2003, p. 98, <http://www.culturalcommons.org/comment-print.cfm?ID=10>.

²⁹ Yochai Benkler, "Freedom in the Commons: Towards a Political Economy of Information," *Duke L. J.*, vol. 55, #6 (Apr. 2003): 1245-76, p. 1256, <http://www.law.duke.edu/shell/cite.pl?52+Duke+L.+J.+1245>.

³⁰ Yochai Benkler, "From Consumers to Users: Shifting the Deeper Structures of Regulation Toward Sustainable Commons and User Access," *Federal Communications L. J.*, vol. 52, # 3 (2000), p. 579, <http://www.law.indiana.edu/fclj/pubs/v52/no3/benkler1.pdf>.

³¹ See, e.g., the National Information Standards Organization (NISO), <http://www.niso.org>, and the International Organization for Standardization (ISO), <http://www.iso.ch/iso/en/ISOOnline.openerspage>. The importance of standards development to an open and accessible information commons is elaborated by Bollier and Watts, *supra* n. 3, pp. 25-38.

³² The first sale rule is found in 17 U.S. Code §109; the fair use defense to copyright infringement in 17 U.S. Code §107. For background, see Jessica Litman, *Digital Copyright*, Amherst, NY: Prometheus Press, 2001; Siva Vaidhyanathan, *Copyrights and Copywrongs: The Rise of Intellectual Property and How It Threatens Creativity*, NY: NYU Press, 2001; Pamela Samuelson, "The Copyright Grab," *Wired*, vol. 4, #1, Jan. 1996, http://www.wired.com/wired/archive/4.01/white.paper_pr.html; National Research Council, *The Digital Dilemma: Intellectual Property in the Information Age*, Washington, DC: National Academy Press, 2000; Marjorie Heins, "The Progress of Science and Useful Arts": Why Copyright Today Threatens Intellectual Freedom, NY: Free Expression Policy Project, 2003, pp. 24-34; Chilling Effects Clearinghouse, <http://www.chillingeffects.org> (cataloguing cease and desist letters that industry sometimes uses to suppress fair use of copyrighted material).

³³ See Julie Cohen, "The Challenge of Digital Rights Management Technologies," in National Research Council, *The Role of Scientific and Technical Data and Information in the Public Domain*, Washington, DC: National Academies Press, 2003: 109-16, <http://books.nap.edu/books/030908850X/html/109.html>; Christopher May, "Digital Rights Management and the Breakdown of Social Norms," *First Monday*, Nov. 2003, http://www.firstmonday.org/issues/issue8_11/may/index.html; Michael Godwin, *What Every Citizen Should Know About DRM*, a.k.a. "Digital Rights Management," Washington, DC: Public Knowledge and the New America Foundation, 2004, <http://www.publicknowledge.org/content/overviews/citizens-guide-to-drm/attachment>; John Walker, *The Digital Imprimatur: How Big Brother and Big Media Can Put the Internet Genie Back in the Bottle*, Oct. 9, 2003, <http://www.fourmilab.ch/documents/digital-imprimatur>; Bill Rosenblatt, "2003 in Review: DRM Technology," *DRM Watch*, Dec. 31, 2003, <http://www.drmwatch.com/drmtech/article.php/3294391>; American Library Association Washington Office, "Digital Rights Management and Libraries," <http://www.ala.org/ala/washoff/WOissues/copyrightb/digitalrights/digitalrightsmanagement.htm>; "Digital Rights Management (DRM) Systems and Copy Protection Schemes," <http://www.eff.org/IP/DRM>; and Electronic Privacy Information Center (EPIC), "Digital Rights Management and Privacy," <http://www.epic.org/privacy/drm>.

³⁴ Another DRM tool is the "broadcast flag," a digital mark that signals conditions allowing or disallowing TV programs to be copied. In November 2003, the FCC mandated that all digital television (DTV) equipment recognize and obey a broadcast flag. "Report and Order and Further Notice of Proposed Rulemaking," *In the Matter of: Digital Broadcast Content Protection*, MB Docket 02-230, Nov. 4, 2003, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-273A1.pdf. In March 2004, the American Library Association and Public Knowledge filed suit challenging the FCC's

authority to issue these regulations. *American Library Association v. FCC*, No. 04-1037 (D.C. Cir., filed Mar. 3, 2004). See also Center for Democracy and Technology, *Implications of the Broadcast Flag: A Public Interest Primer (version 2.0)*, Washington, DC: Center for Democracy and Technology, Dec. 2003, <http://www.cdt.org/copyright/031216broadcastflag.pdf>; Public Knowledge, *Broadcast Flag*, <http://www.publicknowledge.org/issues/current-issues/issue-broadcast-flag>; Motion Picture Association of America, "Broadcast Flag: Frequently Asked Questions," <http://www.mpa.org/Press>.

³⁵ Digital Millennium Copyright Act, 112 Stat. 2863, 17 U.S. Code §§1201-1205.

³⁶ U.S. Information Infrastructure Task Force, Working Group on Intellectual Property Rights, *Intellectual Property and the National Information Infrastructure*, Washington, DC: U.S. Department of Commerce, Patent and Trademark Office, Sept. 1995, <http://www.uspto.gov/web/offices/com/doc/ipnii/ipnii.pdf>.

³⁷ See, e.g. *Universal City Studios v. Corley*, 273 F.3d 429 (2^d Cir. 2001) (distribution of circumvention tool for DVDs violates DMCA); *United States v. Elcom Ltd.*, 203 F. Supp.2d 1125 (N.D. Cal. 2002) (denying motion to dismiss DMCA prosecution for distributing e-book circumvention tool).

³⁸ *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417 (1984).

³⁹ See, e.g., "Author, Consumer, and Computer Owner Protection and Security Act of 2003" (H.R. 2752), introduced by Reps. John Conyers and Howard Berman to curtail peer-to-peer file sharing of copyrighted music and videos; "Piracy Deterrence and Education Act of 2003" (H. R. 2517), introduced by Rep. Lamar Smith, and co-sponsored by Reps. Berman and Conyers, to enhance criminal enforcement of copyright law and "to clarify" the authority to seize unauthorized copies.

⁴⁰ *Feist Publications, Inc. v. Rural Telephone Service Co.*, 499 U.S. 340 (1991).

⁴¹ "Database and Collections of Information Misappropriation Act of 2003" (H.R. 3261), introduced by Rep. Howard Coble and co-sponsored by Reps. James Greenwood, Dave Hobson, James Sensenbrenner, Lamar Smith, and Billy Tauzin, Oct. 8, 2003. See Carol Ebbinghouse, "If at First You Don't Succeed, Stop!: Proposed Legislation to Set Up New Intellectual Property Right in Facts Themselves," *Information Today*, vol. 12, #1 (Jan. 16, 2004), <http://www.infotoday.com/searcher/jan04/ebbinghouse.shtml>; American Library Association, "Database Protection Legislation," <http://www.ala.org/ala/washoff/WOissues/copyrightb/dbprotection/databaseprotection.htm>.

Another example of restrictive legislation, the Uniform Computer Information Transactions Act (UCITA), supersedes consumer and privacy protections as well as copyright law by validating a "clickwrap" approach to electronic licensing. UCITA has been passed in Virginia and Maryland. Although the National Conference of Commissioners on Uniform State Laws announced in August 2003 that it would stop promoting UCITA, it did not formally withdraw the proposed law; thus, UCITA remains a viable option for legislators or others who might modify it to make it more palatable to its detractors. West Virginia, North Carolina, Iowa, and Vermont have enacted "bomb-shelter" legislation that protects residents from being subject to UCITA as enacted in Virginia and Maryland. See American Library Association, "UCITA," <http://www.ala.org/ala/washoff/WOissues/copyrightb/ucita/ucita.htm>; and AFFECT: Americans for Fair Electronic Commerce Transactions, "UCITA," <http://www.affect.ucita.com>.

⁴² Sonny Bono Copyright Term Extension Act, 17 U.S. Code §§301-304.

⁴³ *Eldred v. Ashcroft*, 123 S.Ct. 769 (2003). The original term under the nation's first copyright law was 14 years.

- ⁴⁴ In 2000, federal courts shut down the music file-sharing service Napster (*AESM Records v. Napster*, 239 F.3d 1004 (9th Cir. 2001)), but less centralized systems like Grokster and KaZaA took Napster's place. They too have been sued by the music industry, but as of spring 2004, the courts had not found the distributors of these software tools liable for "contributory" copyright infringement. *Metro-Goldwyn-Mayer Studios v. Grokster*, 259 F. Supp.2d 1029 (C.D. Cal. 2003), appeal pending.
- ⁴⁵ See Yochai Benkler, "The Political Economy of Commons," *Upgrade*, vol. 4, #3, (June 2003), <http://www.upgrade-cepis.org/issues/2003/3/up4-3Benkler.pdf>; Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World*, NY: Random House, 2001; Joseph E. Stiglitz, "Knowledge as a Global Public Good," in Inge Kaul, et. al., *Global Public Goods: International Cooperation in the 21st Century*, NY: Oxford U. Press for The United Nations Development Program, 1999: 308-25; Vincent Mosco and Janet Wasco, eds., *The Political Economy of Information*, Madison, WI: U. of Wisconsin Press, 1988.
- ⁴⁶ Carol M. Rose, *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership*, Boulder, CO: Westview Press, 1994, p. 6.
- ⁴⁷ Baker, *supra* n. 21, p. 73.
- ⁴⁸ See J. A. Yelling, *Common Field and Enclosure in England 1450-1850*, Hamden, CT: Archon Books, 1977; Michael Turner, *Enclosures in Britain 1750-1830*, London: Macmillan, 1984.
- ⁴⁹ Charlotte Hess and Elinor Ostrom, "Ideas, Artifacts, and Facilities: Information as a Common-Pool Resource," *Law & Contemporary Problems*, vol. 66, #1 & 2 (Winter/Spring 2003), pp. 114-18, <http://www.law.duke.edu/journals/lcp/indexpd.htm>.
- ⁵⁰ Henry Sumner Maine, *Ancient Law: its Connection with the Early History of Society and its Relation to Modern Ideas*, Tucson: U. of Arizona Press, 1986.
- ⁵¹ H. Scott Gordon, "The Economic Theory of a Common-Property Resource: The Fishery," *Journal of Political Economy*, vol. 62, #2 (Apr. 1954): 124-142; Anthony D. Scott, "The Fishery: The Objectives of Sole Ownership," *Journal of Political Economy*, vol. 63, # 2 (Apr. 1955): 116-124.
- ⁵² Garrett Hardin, "The Tragedy of the Commons," *Science*, vol. 162, (Dec. 1968): 1243-48.
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- ⁵⁴ Rose, *supra* n. 46, p. 141.
- ⁵⁵ Siegfried V. Ciriacy-Wantrup and Richard C. Bishop, "'Common Property' as a Concept in Natural Resource Policy," *Natural Resources Journal*, vol. 15 (1975): 713-27.
- ⁵⁶ See Glenn G. Stevenson, *Common Property Economics: A General Theory and Land Use Applications*, NY: Cambridge U. Press, 1991, pp. 54-57.

⁵⁷ Carl Dahlman, *The Open Field System and Beyond: A Property Rights Analysis of an Economic Institution*, NY: Cambridge U. Press, 1980, p. 6. See also Vincent Ostrom and Elinor Ostrom, "Public Goods and Public Choices," in *Alternatives for Delivering Public Services: Toward Improved Performance*, Emanuel S. Savas, ed., Boulder, CO: Westview Press, 1977, pp. 7, 9-14. Another economist, Glenn Stevenson, has identified seven useful characteristics that distinguish common goods from public and private goods: (1) well defined boundaries; (2) well-delineated group of users; (3) multiple users of the resource; (4) well-understood rules; (5) shared rights to use the resource; (6) competition for the resource; and, (7) well-delineated group of rights holders. His examples include communal forests in Europe that are group-managed for a limited, well-defined community, and grazing lands available to residents of a particular village during certain pre-determined dates for a limited number of animals. Stevenson, *supra* n.56, p. 47.

⁵⁸ Ostrom, 1990, *supra* n. 53; see also Edella Schlager and Elinor Ostrom, "Property-Rights Regimes and Natural Resources: A Conceptual Analysis," *Land Economics*, vol. 68, #3 (1992): 249-62; Elinor Ostrom, "Property-Right Regimes and Common Goods: A Complex Link," in *Common Goods*, *supra* n. 53.

⁵⁹ Schlager and Ostrom, *supra* n. 58, pp. 250-51.

⁶⁰ See National Research Council, *supra* n. 53; Elinor Ostrom, "A Method of Institutional Analysis," in F.X. Kaufmann, G. Majone, and V. Ostrom, *Guidance, Control, and Evaluation in the Public Sector*, NY: Walter de Gruyter, 1986: 459-75; Oakerson, 1992, *supra* n. 1; Buck, *supra* n. 53, pp. 21-44.

⁶¹ IASCP, "Reinventing the Commons," The Fifth Annual IASCP Conference, Bodoe, Norway: Agricultural U. of Norway, U. of Trondheim and Partners, May 24-28, 1995, <http://www.indiana.edu/~iascp/past.html>; see also <http://www.indiana.edu/~iascp>; Charlotte Hess, "Is There Anything New Under the Sun?: A Discussion and Survey of Studies on New Commons and the Internet," Paper presented at "Constituting the Commons," 8th biennial conference of the International Association for the Study of Common Property, May 31-June 4, 2000, Bloomington, IN, <http://dlc.dlib.indiana.edu/documents/dir0/00/00/05/12/dlc-00000512-00/iascp2000.pdf>.

⁶² Ostrom, 1990, *supra* n. 53; see also Elinor Ostrom, Roy Gardner and James Walker, *Rules, Games, and Common-Pool Resources*, Ann Arbor: U. of Michigan Press, 1994: 23-50; Vincent Ostrom and Elinor Ostrom, *supra* n. 57, pp. 7, 9-14; Thomas Dietz, Elinor Ostrom, and Paul C. Stern, "The Struggle to Govern the Commons," *Science*, vol. 302, # 5652, (Dec. 12 2003): 1907-12; Jules Pretty, "Social Capital and the Collective Management of Resources," *Science*, vol. 302, # 5652 (Dec. 12 2003): 1912-13.

⁶³ Hess and Ostrom, *supra* n. 49, p. 132.

⁶⁴ See, e.g., Benjamin Barber, *Strong Democracy*, Berkeley: U. of California Press, 1984; Benjamin Barber, *A Place for Us: How to Make Society Civil and Strong*, NY: Hill & Wang, 1998; Harry C. Boyte, *The Backyard Revolution: Understanding the New Citizen Movement*, Philadelphia: Temple U. Press, 1980; Harry C. Boyte, *Commonwealth: A Return to Citizen Politics*, NY: The Free Press, 1989; Harry C. Boyte and Sara M. Evans, *Free Spaces: The Sources of Democratic Change in America*, NY: Harper & Row, 1986, rev. ed. Chicago: U. of Chicago Press, 1992; Friedland and Boyte, *supra* n. 2; Peter Levine, "Building the Electronic Commons," *The Good Society*, vol. 11, #3, 2002: 4-9, <http://www.peterlevine.ws/goodsociety.pdf>; Peter Levine, "Civic Renewal and the Commons of Cyberspace," *National Civic Review*, vol. 90, # 3 (Fall 2001): 205-12, <http://www.ncl.org/publications/ncr/90-3/chapter1.pdf>; Ronald Hayuk and Kevin Mattson, eds., *Democracy's Moment: Reforming the American Political System for the 21st Century*, Lanham, MD: Rowman & Littlefield, 2002; Carmen Sirianni and Lewis Friedland, *Civic Innovation in America: Community Empowerment, Public Policy, and the Movement for Civic Renewal*, Berkeley: U. of California Press, 2001.

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The Free Expression Policy Project is supported by grants from the Robert Sterling Clark Foundation, the Rockefeller Foundation, the Nathan Cummings Foundation and the Andy Warhol Foundation for the Visual Arts.

