

The Digital Dilemma: Intellectual Property in the Information Age

COMMITTEE ON INTELLECTUAL PROPERTY RIGHTS AND
THE EMERGING INFORMATION INFRASTRUCTURE

COMPUTER SCIENCE AND TELECOMMUNICATIONS BOARD

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Executive Summary*

THE ORIGINS OF THE DIGITAL DILEMMA

Borrowing a book from a local public library would seem to be one of the most routine, familiar, and uncomplicated acts in modern civic life: A world of information is available with little effort and almost no out-of-pocket cost. Such access to information has played a central role in American education and civic life from the time of Thomas Jefferson, who believed in the crucial role that knowledge and an educated populace play in making democracy work. Yet the very possibility of borrowing a book, whether from a library or a friend, depends on a number of subtle, surprisingly complex, and at times conflicting elements of law, public policy, economics, and technology, elements that are in relative balance today but may well be thrown completely out of balance by the accelerating transformation of information into digital form.

The problem is illustrated simply enough: A printed book can be accessed by one or perhaps two people at once, people who must, of course, be in the same place as the book. But make that same text available in electronic form, and there is almost no technological limit to the number of people who can access it simultaneously, from literally anywhere on the planet where there is a telephone (and hence an Internet connection).

At first glance, this is wonderful news for the consumer and for society: The electronic holdings of libraries (and friends) around the world can become available from a home computer, 24 hours a day, year-round; they are never "checked out." These same advances in technology create new opportunities and markets for publishers.

But there is also a more troublesome side. For publishers and authors, the question is, How many copies of the work will be sold (or licensed) if networks

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make possible planet-wide access? Their nightmare is that the number is one. How many books (or movies, photographs, or musical pieces) will be created and published online if the entire market can be extinguished by the sale of the first electronic copy?

The nightmare of consumers is that the attempt to preserve the marketplaces leads to technical and legal protections that sharply reduce access to society's intellectual and cultural heritage, the resource that Jefferson saw as crucial to democracy.

This deceptively simple problem illustrates the combination of promise and peril that make up the digital dilemma. The information infrastructure—by which we mean information in digital form, computer networks, and the World Wide Web—has arrived accompanied by contradictory powers and promises. For intellectual property in particular it promises more—more quantity, quality, and access—while imperiling one means of rewarding those who create and publish. It is at once a remarkably powerful medium for publishing and distributing information, and the world's largest reproduction facility. It is a technology that can enormously improve access to information, yet can inhibit access in ways that were never before practical. It has the potential to be a vast leveler, bringing access to the world's information resources to millions who had little or no prior access, and the potential to be a stratifier, deepening the division between the information "haves" and "have-nots."

The information infrastructure has as well the potential to demolish a careful balancing of public good and private interest that has emerged from the evolution of U.S. intellectual property law over the past 200 years. The public good is the betterment of society that results from the constitutional mandate to promote the "progress of science and the useful arts"; the private interest is served by the time-limited monopoly (a copyright or patent) given to one who has made a contribution to that progress. The challenge is in striking and maintaining the balance, offering enough control to motivate authors, inventors, and publishers, but not so much control as to threaten important public policy goals (e.g., preservation of the cultural heritage of the nation, broad access to information, promotion of education and scholarship). As usual, the devil is in the details, and by and large the past 200 years of intellectual property history have seen a successful, albeit evolving, balancing of those details. But the evolving information infrastructure presents a leap in technology that may well upset the current balance, forcing a rethinking of many of the fundamental premises and practices associated with intellectual property.

The stakes involved in all this are high, both economically and in social terms. Decisions we make now will determine who will benefit from the technology and who will have access to what information on what terms—foundational elements of our future society.

The Committee on Intellectual Property Rights and the Emerging Information Infrastructure believes that fundamental change is afoot. As a society

we need to ask whether the existing mechanisms still work, and if not, what should be done. What options exist for accomplishing the important goals of intellectual property law and policy in the digital age? Test cases are now the stuff of daily news, as for example the upheaval in music publishing and distribution caused by digital recording and the MP3 format. The committee believes that society needs to look further out than today's crisis, try to understand the nature of the changes taking place, and determine as best it can what their consequences might be, what it would wish them to be, and how it might steer toward fulfilling the promise and avoiding the perils. Stimulating that longer-range exploration is the purpose of this report.

Although the report builds on some past efforts, it takes a broader approach, analyzing the issues from the perspective of a multiplicity of relevant disciplines: law, technology, public policy, economics, sociology, and psychology. The committee strongly believes that attempts to consider digital intellectual property issues through a single lens will necessarily yield incomplete, and often incorrect, answers. The report is narrow in one sense, focusing primarily on copyright because it protects the intellectual property most frequently encountered by the general public.

Opinions run strong on almost every issue addressed in this report, in large part because the stakes are so high. If, as is often claimed, societies are seeing a shift in economies as significant as the industrial revolution, with the transition to knowledge and information as a major source of wealth, then intellectual property may well be the most important asset in the coming decades.

(WHY) IS THERE A PROBLEM?

Origins of the Issues

Two events motivate reexamining the concepts, policies, and practices associated with intellectual property:

- *Advances in technology have produced radical shifts in the ability to reproduce, distribute, control, and publish information.*

—Information in digital form has radically changed the economics and ease of reproduction. Reproduction costs are much lower for both rights holders (content owners) and infringers alike. Digital copies are also perfect replicas, each a seed for further perfect copies. One consequence is an erosion of what were once the natural barriers to infringement, such as the expense of reproduction and the decreasing quality of successive generations of copies in analog media. The average computer owner today can easily do the kind and the extent of copying that would have required a significant investment and perhaps criminal intent only a few years ago.

—Computer networks have radically changed the economics of distribution. With transmission speeds approaching a billion characters per second, networks enable sending information products worldwide, cheaply and almost instantaneously. As a consequence, it is easier and less expensive both for a rights holder to distribute a work and for individuals or pirates to make and distribute unauthorized copies.

—The World Wide Web has radically changed the economics of publication, allowing everyone to be a publisher with worldwide reach. The astonishing variety of documents, opinions, articles, and works of all sorts on the Web demonstrate that millions of people worldwide are making use of that capability.

• With its commercialization and integration into everyday life, the information infrastructure has run headlong into intellectual property law. Today, some actions that can be taken casually by the average citizen—downloading files, forwarding information found on the Web—can at times be blatant violations of intellectual property laws; others, such as making copies of information for private use, may require subtle and difficult interpretation of the law simply to determine their legality. Individuals in their daily lives have the capability and the opportunity to access and copy vast amounts of digital information, yet lack a clear picture of what is acceptable or legal. Nor is it easy to supply a clear, “bright-line” answer, because (among other things) current intellectual property law is complex.

Why the Issues Are Difficult

The issues associated with intellectual property (IP) in digital form addressed in this report are difficult for a number of reasons:

• *The stakeholders are many and varied.* A wide variety of stakeholders present a broad range of legitimate concerns about the impacts of information technology. It is important to understand what these different concerns are and how technology affects these stakeholders. For example, the ability to self-publish on the Web may change the interaction between authors and traditional publishers, leading to shifts in power (see, for example, the discussion in Chapter 2 on music).

• *Content creators have different agendas, handle IP according to varying strategies, and look for different kinds of return on their investment.* Authors have a variety of motivations, different notions of what constitutes a return on their investment, and as a consequence, different strategies for handling intellectual property. The traditional model—content produced and sold, either directly or with advertiser support—is the most familiar and encourages a view of IP law as the foundation that provides exclusive rights. But other models include giving intellectual property away in the expectation of obtaining indirect benefit in a

positively correlated market (e.g., distributing free Web browser software in the expectation of building a market for Web server software), sharing IP to enhance the community (e.g., providing open source software such as Linux and the Apache Web server), or keeping it private (e.g., establishing trade secrets).

The multiplicity of actors, motivations, returns, and strategies matters because discussions concerning intellectual property (e.g., the effects of changes in levels of IP protection) are often set in the context of a single model, suggesting that all parties are affected equally by any change in IP law or policy. But the actors are not homogeneous, and the consequences of IP policy decisions will not be felt uniformly. Policy discussions must take into account the heterogeneity of strategies for IP (as Benkler, 1999, elaborates).

• *Fundamental legal concepts can be interpreted differently.* For example, significantly different (and emphatic) views exist on whether the notion of “fair use” is to be construed as a defense against a charge of infringement or an affirmative right that sanctions copying in specific circumstances.¹ The difference matters, for both theoretical and pragmatic reasons. If fair use is an affirmative right, for instance, then it ought to be acceptable to take positive actions, such as circumventing content protection mechanisms (e.g., decoding an encrypted file), in order to exercise fair use. But taking such positive actions may well be illegal under the regime of fair use as a defense. The basic point is very controversial; some legal scholars (and a reviewer of this report) have labeled as “absurd” the notion that fair use could be an affirmative right.

• *Laws and practices vary worldwide, yet networks have global reach.* The information infrastructure, like the communications networks on which it builds, is global, yet there is considerable variation in different countries’ laws, enforcement policies, and even cultural attitudes toward IP. This report focuses on U.S. law and practices but acknowledges that larger global issues are important and in many ways unavoidable. For example, it is typically impossible to determine where a reader of electronic information happens to be physically (and hence whose laws apply), and at times quite easy to move information from a country where certain actions may be illegal to one where laws (or enforcement) are lax.

• *The economics of information products and IP can be subtle.* Although content-producing industries account for a sizable and growing portion of the nation’s economy and international trade, the economic significance of protecting

¹ When one author quotes another, some (presumably small) amount of literal copying has occurred. The “defense” view of fair use holds that the literal copying, while a violation of the original author’s exclusive rights, is excused by fair use and its public policy goal (namely, that society benefits from authors building on and critiquing previous work, even if they have to copy a small part of it). The affirmative right view of fair use, by contrast, holds the public policy goal as key and sees the copying not as a violation to be excused, but as a right that later authors have with respect to work that preceded them (as long as the copying stays within fair use guidelines).

IP is not completely clear. Stronger IP protection could encourage increased levels of creative output, resulting in more rapid progress and additional information products. But protecting IP also entails costs, including costs for directly related activities such as enforcement, and other less obvious costs (such as decreased ability to build on the work of others and the increased expenditure of resources to reproduce a product without violating its IP protection). The net economic effects of changes in protection levels are difficult to assess.

ISSUES IN ACCESS TO INFORMATION

Public Access

Copying and Access

In the digital world, even the most routine access to information invariably involves making a copy: Computer programs are run by copying them from disk to memory, for example (an act that some courts have ruled to be “copying” for the purposes of copyright law), and Web pages are viewed by copying them from a remote computer to the local machine. But the exclusive right to copy is the first and perhaps most basic right of a copyright holder. How can the conflict be resolved between the desire to provide access to works and the desire to control copying, if, for digital information, access is copying?

This dilemma affects authors and publishers who wish to distribute digital works and need a way to accomplish this so that the work can be accessed, yet still be protected against unauthorized reproduction. The problem affects policy makers, because the traditional first-sale rule of copyright, an important element of public policy, is undermined by information in digital form. That rule works in the world of physical artifacts because they are not easily reproduced by individuals and are not accessible to multiple, distant viewers. But neither of these limitations holds for digital works. Consumers are affected as well, because access is accomplished by copying, and in the digital world copyright’s traditional control of copying would mean control of access as well.

Conclusion: The tradition of providing for a limited degree of access to published materials that was established in the world of physical artifacts must be continued in the digital context. But the mechanisms for achieving this access and the definition of “limited degree” will need to evolve in response to the attributes of digital intellectual property and the information infrastructure.

In the physical world, publication has three important characteristics: It is public, it is irrevocable, and it provides a fixed copy of the work. In the digital

world, none of these may be true. In the physical world, publication is fundamentally public and irrevocable because, while the work does not become the property of the public, enough copies are usually purchased (e.g., by libraries and individuals) that it becomes part of the publicly available social and cultural record. Publication is irrevocable because once disseminated, the work is available. Works may go out of print, but they are never explicitly taken “out of publication” and made universally unavailable; copies of printed works persist. Publication also accomplishes a certain fixity of the work: Distributed copies represent an archival snapshot; subsequent editions may be published, but each of them adds to the public record.

Works published in electronic form are not necessarily irrevocable, fixed, or public. They can be withheld from scrutiny at the discretion of the rights holder. Nor are they inherently public: Software enables fine-grained control of access, making works as open or as restricted as the rights holder specifies, with considerable ability to fine-tune who has what kind of access. The information infrastructure also offers many options for distribution other than printing and selling copies, including distribution on electronic mailing lists, posting on a password-protected Web site, and posting on preprint servers, among others. Nor are works in electronic form fixed: Old versions are routinely overwritten with new ones, obliterating any historical record. (What is the value of citing a Web page, if the content there is easily changed?) In some ways, the properties of digital distribution are desirable; some material (e.g., privately produced reports, business data) may be distributed in digital form precisely because of these characteristics, where it would not have been published at all in the traditional manner. But those properties can also cause difficulties.

Conclusion: The information infrastructure blurs the distinction between publication and private distribution.

Recommendation: The concept of publication should be re-evaluated and clarified (or reconceptualized) by the various stakeholder groups in response to the fundamental changes caused by the information infrastructure. The public policy implications of a new concept of publication should also be determined.

Licensing and Technical Protection Services

Use of licensing is becoming more widespread, especially for information previously embedded in physical artifacts and sold under the first-sale doctrine. Increasingly, digital information acquired by libraries, for example, is available only by license. While some licenses may have advantages (e.g., providing more rights than are normally available under copyright), their use as a model for

distribution of information raises a number of concerns, particularly the potential for an adverse impact on public access.

The trend toward licensing also means that digital information is in some ways becoming a service rather than a product. Buy a book and you own it forever; pay for access to a digital book and when the period of service is over, you often retain nothing. This is acceptable in a variety of circumstances but can be problematic for archival purposes.

Licensors are also under no obligation to incorporate the public policy considerations (e.g., fair use) that have been carefully crafted into copyright law. Mass-marketed information products raise a more general concern, as they may substitute a contract (over which consumers have little control) for copyright law. Mass-market license terms also raise concerns about the legal uses of works in schools, libraries, and archives.

Technical protection mechanisms currently being explored are similarly a two-edged sword. They make possible the distribution of some digital information that rights holders would otherwise be reluctant to release, but also have the potential for significant adverse impact on public access. Encryption technologies under development could enable the distribution of content in such a way that consumers would find it difficult to do anything but view it: The technology can make it very difficult to save a decrypted digital version of information or even print it, should a publisher choose to package the information under those conditions. (The publisher need not set such terms, of course, or may choose simply to charge one price for viewing, an additional fee for saving, and yet another fee for printing.)

Distribution without the right to save and/or print would create a world in which information may be distributed but never easily shared. Some committee members believe that if copyright is truly to be a pact between society and authors to encourage the creation and dissemination of information for society's ultimate benefit, highly constrained models of distribution call this pact into question. Market forces may ultimately discourage this approach, but the committee believes that it is important for this issue to be tracked so that, should this more restrictive approach become widespread, consideration can be given to public policy responses.

Conclusion: The confluence of three developments—the changing nature of publication in the digital world, the increasing use of licensing rather than sale, and the use of technical protection services—creates unprecedented opportunities for individuals to access information in improved and novel ways, but also could have a negative impact on public access to information. Developments over time should be monitored closely.

Recommendation: Representatives from government, rights holders, publishers, libraries and other cultural heritage institutions, the public, and technology providers should convene to begin a discussion of models for public access to information that are mutually workable in the context of the widespread use of licensing and technical protection services.

Archiving and Preservation

The information infrastructure raises important concerns with respect to archiving and preservation. The maintenance of our history, record of social and cultural discourse, scholarship, and scientific debate and discovery are of fundamental importance to our society. In the print world, the act of publication automatically makes archiving possible, both legally and logistically. In the digital world, where licensing is increasingly prevalent, archiving is allowed by the licensee only if it is explicitly authorized in the terms of the contract. Although some publishers facilitate such provisions (e.g., a few scholarly publishers), many others have not. In addition to the issues raised by licensing, other challenges with respect to digital archiving include an inadequate base of technological knowledge, insufficient funding, concerns about copyright liability, and a lack of large-scale collective endeavors by the relevant institutions.

Recommendation: A task force on electronic deposit should be chartered to determine the desirability, feasibility, shape, and funding requirements of a system for the deposit of digital files in multiple depositories.

The task force membership should broadly represent the relevant stakeholders and should be organized by an unbiased entity with a national reputation, such as the Library of Congress or some other governmental organization that has a pertinent charter and relevant expertise. The task force should be assigned for a limited term (2 years maximum).

Recommendation: Congress should enact legislation to permit copying of digital information for archival purposes, whether the copy is in the same format or migrated to a new format.

Access to Federal Government Information

Widespread use of the Web has in general provided greatly expanded access to federal government information. However, in some parts of the government,

the evolution of the information infrastructure has instead been associated with a trend toward the commercialization of government information, increasingly limiting the amounts of information that can be accessed inexpensively by the public.

Conclusion: When commercial enterprises add value to basic data, the resulting products deserve copyright protection insofar as these products otherwise satisfy the legal requirements for copyright.

Recommendation: As a general principle, the basic data created or collected by the federal government should be available at a modest cost, usually not to exceed the direct costs associated with distribution of the data. When agencies contract with a commercial enterprise to make federally supported primary data available, and provide no other mechanism for access to the data, such agreements should provide for public access at a cost that does not exceed the direct costs associated with distribution.²

Individual Access and Use

Private Use and Fair Use

The information infrastructure raises the stakes around questions of private use and fair use and has increased copyright law's concern with private behavior. One of the most contentious copyright issues concerns the legality of private, noncommercial copying. While the issue is applicable beyond the sphere of digital information, the risks to rights holders are especially acute when the information is in digital form. Some rights holders believe that nearly all unauthorized reproductions are infringements, while many members of the general public believe that virtually all private, noncommercial copying of copyrighted works is lawful. The true legal status of private copying is somewhere in between these extremes.

Copyright has traditionally been concerned with public acts, such as public display and public performances. But with the evolving information infrastructure, private behavior (e.g., private use copying) is having a larger impact on the market, and the distinction between public and private is (as noted above) blurred in the digital world.

² The committee did not address the status of the data and research created by federally supported researchers based at academic or other institutions outside the federal government.

Conclusion: A widespread (and incorrect) belief prevails in society that private use copying is always or almost always lawful. This viewpoint is difficult to support on either legal or ethical grounds. It is important to find ways to convince the public to consider thoughtfully the legality, ethics, and economic implications of their acts of private copying.

Conclusion: Fair use and other exceptions to copyright law derive from the fundamental purpose of copyright law and the concomitant balancing of competing interests among stakeholder groups. Although the evolution of the information infrastructure changes the processes by which fair use and other exceptions to copyright are achieved, it does not challenge the underlying public policy motivations. Thus, fair use and other exceptions to copyright law should continue to play a role in the digital environment.

The appropriate scope of fair use may be reduced by the development of new licensing regimes enabled by the digital environment that reduce transaction costs, thereby reducing market failures and some of the rationale for fair use. Even so, there are other public policy rationales for fair use that should not be overlooked.

Conclusion: Providing additional statutory limitations on copyright and/or additional statutory protection may be necessary over time to adapt copyright appropriately to the digital environment. The fair use doctrine may also prove useful as a flexible mechanism for adapting copyright to the digital environment.

Opportunities and Challenges for Authors and Publishers

Authors and publishers alike find both promise and peril in the information infrastructure. For authors, it expands the class of “published” authors and makes available inexpensive distribution methods over which authors can exercise direct control, which may well produce a realignment of interests. It has also led to changes in terms for the ownership of digital rights, often to the disadvantage of the author. The greater malleability of works in digital as opposed to hard-copy form also raises new concerns about the authenticity and integrity of the information.

Point of Discussion: Many members of the committee believe that a task force on the status of the author should be established, with the goal of preserving the spirit of the constitutional protection and incentives for authors and inventors. Such a task force would evaluate the viability of

mechanisms that facilitate both distribution and control of work (e.g., rights clearance mechanisms) and examine whether issues should be addressed with government action or kept within the framework of private-sector bargaining.

For publishers, the information infrastructure promises the possibility of reduced costs for new information products and distribution but also brings uncertainty. Publishers are unsure, for example, what their revenue models will be in the online environment and face the most fundamental of issues in the digital dilemma: How can they distribute digital information without losing control of it?

Mechanisms for Protecting Intellectual Property

Technical Protection Tools

Technical protection tools include a wide variety of software- and hardware-based mechanisms that limit access to or use of information. Although these technologies are not widely used for IP protection in 1999, a few tools have been deployed to protect IP in certain niches with some success, for example, the digital watermarking of images, and selected use of encryption, especially in the entertainment industry (e.g., the encryption used in cable TV delivery).³ Software-based tools have the advantage of ease of distribution, installation, and use. They also have a major drawback because the protected content must eventually be displayed to the user (or somehow "consumed") for its value to be realized. If the content is delivered to an ordinary PC, the information displayed can today be captured and copied by anyone with sufficient technical knowledge.

A higher level of protection for valuable content in the face of determined adversaries requires special-purpose hardware. This is (in part) the inspiration behind some "information appliances" (e.g., portable players for digital music, portable electronic books) and behind so-called "trusted systems," a combination of software and special hardware. Information appliances are beginning to have an impact in the market and may provide an effective delivery vehicle because they are not general-purpose (i.e., programmable) computers, from which displayed content can be captured fairly easily. The trusted system approach, to the extent that it relies on special-purpose hardware incorporated into ordinary PCs, faces the problem of convincing the many users of existing PCs to set aside

³ Encryption is used widely for other purposes, such as the use of the secure socket layer in communication over the Web to protect the confidentiality of transactions, but to date has been used sparingly for IP protection.

their investment in existing hardware and buy new devices that will, in some ways, be less capable.⁴

Conclusion: Technical protection mechanisms are useful but are not a panacea.

Whatever the mechanism used, it is important to keep in mind that no protection mechanism is perfect. As with any security system, defeating it is a matter of time, effort, and ingenuity. Yet, as with any security system, perfection is not required for real-world utility: Existing technical protection mechanisms can protect digital information to a degree that keeps fundamentally honest people honest; this appears to be sufficient for a wide range of uses. The deployment of mechanisms also involves trade-offs that must be judged carefully: Adding a protection mechanism involves costs to the vendor (software development and maintenance) and to the consumer (e.g., time and inconvenience). Hence, as with any security mechanism, technical protection must be carefully matched to the need.

Recommendation: Rights holders might consider using technical protection services to help manage digital intellectual property but should also bear in mind the potential for diminished public access and the costs involved, some of which are imposed on customers and society.

The experimental circumvention of technologies used to protect intellectual property is a common practice in the cryptology and security R&D community, one that enables the development of more efficient and effective protection technologies. This useful practice is threatened by recent developments, notably the Digital Millennium Copyright Act (DMCA), which makes circumvention illegal except under certain conditions. The overall approach favored by the cryptology and security community is to make circumvention legal, while making certain exploitations of successful circumventions illegal (including, of course, the theft of IP). Some members of the committee believe that a number of specific changes are needed to the DMCA (detailed in Chapter 6).

Conclusion: As cryptography is frequently a crucial enabling technology for technical protection services, continued advances in technical protection services require a productive and leading-edge community of cryptography and security researchers and developers.

⁴ The Trusted Computing Platform Alliance, a collaborative effort founded by Compaq, HP, IBM, Intel, and Microsoft, is apparently aimed at just such a goal, trying to provide security at the level of the hardware, BIOS, and operating system. See <http://www.trustedpc.org>.

Business Models

Intellectual property protection is often viewed in terms of just law and technology: The law indicates what may be done legally, while technology provides some degree of on-the-spot enforcement. But law and technology are not the only tools available. A third, powerful factor in the mix is the business model. By selecting an appropriate business model, a rights holder can at times significantly influence the pressure for and degree of illegal commercial copying and unauthorized reproduction by individuals.

Business models that can contribute to the protection of IP include traditional sales models (low-priced mass-market distribution with convenient purchasing, where the low price and ease of purchase make it more attractive to buy than to copy) and advertiser-supported models (selling readers' attention to keep the product price low), as well as the more radical step of giving away IP and selling a complementary product or service (e.g., open source software given away, with consulting and maintenance as the service). Simply put, because digital content is difficult to protect, it can be very profitable to find a business model that does not rely primarily on technical protection, or even one that exploits tendencies to share and redistribute content.

Recommendation: Rights holders should give careful consideration to the power that business models offer for dealing with distribution of digital information. The judicious selection of a business model may significantly reduce the need for technical protection or legal protection, thereby lowering development and enforcement costs. But the model must be carefully matched to the product: While the appropriate business model can for some products obviate the need for technical protection, for others (e.g., first-run movies) substantial protection may be necessary (and even the strongest protection mechanisms likely to be available soon may be inadequate).

Alternatives to Networks for Distribution of Content

Not every information product need be distributed by digital networks, given the availability of alternative mechanisms offering most of the advantages and far fewer risks. High-value, long-lived products (e.g., classic movies like *The Wizard of Oz*) might never be made legally available on the Internet while protected by copyright, because the consequences of someone capturing the bits are simply too great, and the technical, legal, and social enforcement costs of ensuring that this does not happen are prohibitive. Simply put, the information infrastructure need not be made completely safe for the mass marketing of every form of content.

The pressure to do so is reduced by the possibility of developing special-purpose delivery devices (such as digital video disks (DVDs)) that combine both software encryption and specialized hardware in a manner that makes the decrypted digital content very difficult to capture. While the specific encryption system used in DVDs was cracked late in 1999, it is still the case that making the content accessible only with specialized hardware can offer substantially more security than is possible with the software-only solutions used when content is delivered to general-purpose PCs. Delivering digital content in a physical medium (like a DVD) offers a combination of the advantages of digital content (e.g., compactness, low manufacturing cost) and the advantages of previous distribution media, like books, in which the content is “bound to” the physical object and hence less easily reproduced. With media like this available, there may be no need to risk the consequences of networked distribution for every work.

Conclusion: Some digital information may be distributed more securely using physical substrates rather than by computer networks.

Summary—Protecting Intellectual Property

Given the diversity of digital information products, from scholarly articles and single songs to encyclopedias and full-length movies, no single solution is likely to be a good match to the entire range, nor would it be useful to attempt to select just one: It would be as unreasonable to treat all IP as if it were an inexpensive, low-end product as it would be to treat it all as an expensive, high-value product.

Conclusion: There is great diversity in the kinds of digital intellectual property, business models, legal mechanisms, and technical protection services possible, making a one-size-fits-all solution too rigid. Currently, a wide variety of new models and mechanisms are being created, tried out, and in some cases discarded, at a furious pace. This process should be supported and encouraged, to allow all parties to find models and mechanisms well suited to their needs.

Recommendation: Legislators should not contemplate an overhaul of intellectual property laws and public policy at this time, to permit the evolutionary process described above the time to play out.

Copyright Education

The committee believes that the public welfare would be well served by a program of education explaining why respect for copyright is beneficial for society as a whole (i.e., that copyright has benefits for all stakeholders, not only for rights holders), and detailing both the privileges and limitations of copyright protection. Copyright is the focus here because it is the form of intellectual property law most routinely encountered by the general public.

Conclusion: A better understanding of the basic principles of copyright law would lead to greater respect for this law and greater willingness to abide by it, as well as produce a more informed public better able to engage in discussions about intellectual property and public policy.

Recommendation: An educational program should be undertaken that emphasizes the benefits that copyright law provides to all parties. Such a copyright education program needs to be planned and executed with care. Appendix F discusses the rationale for and the desirable characteristics of copyright education.

The committee could not decide how extensive copyright education should be, who should conduct this education, or who should pay for it. However, the committee agreed that copyright education should focus on the basic fairness of the copyright law, should not be oversimplified, and should not be mandated by the federal government.

RECOMMENDATIONS FOR RESEARCH AND DATA COLLECTION

There are substantial gaps in the knowledge base available to policy makers who must grapple with the problems raised by digital intellectual property. In some cases, there has been little or no inquiry, while in others there are questions about the reliability of the information available. The committee urges the funders and managers of research programs to give priority to the areas of inquiry described below.

Economics of Copyright

Recommendation: Research should be conducted to characterize the economic impacts of copyright. Such research might consider, among other things, the impact of network effects in information industries and how digital networks are changing transaction costs.

To date, the methodology employed in some of the studies of illegal commercial copying has produced high-end estimates of losses in gross revenue. Trade associations would make a more useful contribution to the debate if they revised their methodology so that their estimates better reflect the losses attributable to illegal commercial copying. Notwithstanding the methodological deficiencies of the reported information, the committee concluded that the volume and the cost of illegal commercial copying are substantial.

Recommendation: Research should be initiated to better assess the social and economic impacts of illegal commercial copying and how they interact with private noncommercial copying for personal use.

The Possibility of an Alternative Foundation for Copyright

Given the challenges to the copyright regime posed by digital information, the committee concluded that alternatives to a copy-based model for protection of digital information deserve consideration, even if the implementation of any new model is not likely to occur anytime soon.

Recommendation: The committee suggests exploring whether or not the notion of copy is an appropriate foundation for copyright law, and whether a new foundation can be constructed for copyright, based on the goal set forth in the Constitution (“promote the progress of science and the useful arts”) and a tactic by which it is achieved, namely, providing incentive to authors and publishers. In this framework, the question would not be whether a copy had been made, but whether a use of a work was consistent with the goal and tactic (i.e., did it contribute to the desired “progress” and was it destructive, when taken alone or aggregated with other similar copies, of an author’s incentive?). This concept is similar to fair use but broader in scope, as it requires considering the range of factors by which to measure the impact of the activity on authors, publishers, and others.

Operation of Copyright Law in the New Digital Environment

Digital technology enables the creation of new kinds of information products and services, which raises a multitude of legal issues. Digital repositories pose difficult questions about authorship, ownership, and the boundaries among protected works. Additional issues arise concerning the meaning of digital publication and the distinctions between fair use and private use.

Recommendation: Legal research should be undertaken on the status of temporary reproductions and derivative work rights to inform the process of adapting copyright law to the digital environment, and to assist policy makers and judges in their deliberations.

As one example of the utility of such research, only a few years ago, proxy caching by online service providers and linking from one Web site to another on the Web were the subjects of considerable debate. Both are now generally thought to be lawful as a matter of U.S. copyright law, a position enabled in part by legal research that has explored the implications of alternative resolutions.

Recommendation: Legal, economic, and public policy research should be undertaken to help determine the extent to which fair use and other exceptions and limitations to copyright should apply in the digital environment. As public policy research, legal developments, and the marketplace shape the scope of fair use and other limitations on copyright, and/or demonstrate a need for additional protections, any additional actions that may be needed to adapt the law, educate the public about it, or enforce the law may become clearer.

Recommendation: Research should be undertaken in the areas that are most likely to intersect with intellectual property law, namely, contract law, communications policy, privacy policy, and First Amendment policy. The interaction of intellectual property law and contract law is likely to be of particular significance in the relatively near future, as licensing becomes a more common means of information distribution, leading to potential conflicts with the goals of IP law.

Impacts of the Broadening Use of Patents for Information Inventions

The long-term effects of the substantial de facto broadening of patent subject matter to cover information inventions such as computer programs, information design, and business methods (e.g., Internet business models) are as yet unclear, although the committee is concerned about the effects to date. Because this expansion has occurred without any oversight from the legislative branch and takes patent law into uncharted territory, this phenomenon needs to be studied on a systematic basis, empirically and theoretically, to ensure that expansion of patent protection is fulfilling its fundamental goal of promoting progress.

Recommendation: Research should be conducted to ensure that expansion of patent protection for information inventions is aligned with

the constitutional intent of promoting the progress of science and the useful arts.

Improved Information on Perceptions and Behavior of the General Public Toward Intellectual Property

Little is known about how frequently individuals duplicate copyrighted materials and whether they even pause to question whether this activity may be illegal.

Recommendation: Research and data collection should be pursued to develop a better understanding of what types of digital copying people think are permissible, what they regard as infringements, and what falls into murky ill-defined areas. Such research should address how these views differ from one community to another, how they differ according to type of material, how user behavior follows user beliefs, and to what extent further knowledge about copyright law is likely to change user behavior.

A series of careful studies would help in assessing how various groups of individuals perceive copyright, and aid in determining when the law is violated through lack of knowledge versus when it is violated knowingly. Such studies are critical to shaping workable laws and designing educational campaigns to promote compliance.

GUIDELINES FOR USE IN FORMULATING LAW AND PUBLIC POLICY

The committee tried to develop several recommendations for specific changes to laws and public policy. This proved to be a formidable and often frustrating process and perhaps, in retrospect, an imprudent effort, because of the uncertainty created by the evolving information infrastructure, business models, and social responses to the uncertainty. A significant portion of the committee's deliberations can be characterized as spirited and energetic discussions. That this committee, a diverse and balanced group of experts, had difficulty in achieving consensus in many areas, despite extensive briefings, background reading, and deliberations, should serve as a caution to policy makers to contemplate changes to law or policy with the utmost care. Nevertheless, the committee offers some general principles that should prove useful in the formulation of law and public policy in the future.

Law constrains (or at least affects) behavior, but so do markets, social norms, and the constraints embedded in software, as for example, the computer program

that controls access to a Web site. Being aware of the multiplicity of forces aids in understanding and analyzing issues and may open up additional routes for dealing with issues; not every problem need be legislated (or priced) into submission. In addition, content itself should not be viewed as a monolith: Some content (e.g., classic movies) has a high and persistent value; other content (e.g., today's traffic report) may have a modest value for a limited time period before becoming economically worthless (though perhaps of historical value later on). Thus, not all content needs the same kind of IP protection.

Conclusion: Law and public policy must be crafted to consider all the relevant forces in the digital environment. Initiatives that consider or rely on only one or a subset of the relevant forces are not likely to serve the nation well.

The rapid evolution in technology will be an ongoing source of uncertainty and, likely, frustration for policy makers who conceive of and attempt to deal with issues narrowly, in terms of the extant technology.

Conclusion: Policy makers must conceive of and analyze issues in a manner that is as technology-independent as possible, drafting policies and legislation in a similar fashion. The question to focus on is not so much exactly what device is causing a problem today, as what the underlying issue is. Nor should policy makers base their decisions on the specifics of any particular business model.

The information infrastructure makes private infringement of IP rights vastly easier to carry out and correspondingly more difficult to detect and prevent. As a result, individual standards of moral and ethical conduct, and individual perceptions of right and wrong, become more important. Laws that are simple, clear, and comprehensible are needed, particularly those parts of the IP law that are most directly relevant to consumer behavior in daily life. Support and adherence are far more likely if IP law is clearly understood and viewed by the general public as embodying reasonable standards of normative behavior. If intellectual property law is perceived as being so absolute in its prohibitions as to sweep within those prohibitions behavior that most individuals feel is not morally or ethically culpable, then even the more reasonable restrictions contained in the same body of law may be painted with the same brush and viewed as illegitimate.

Conclusion: Public compliance with intellectual property law requires a high degree of simplicity, clarity, straightforwardness, and comprehensibility for all aspects of copyright law that deal with individual behavior. New or revised intellectual property laws should be drafted accordingly.

Recommendation: Policy makers should use the principles outlined in Box 6.2 [Chapter 6] in the formulation of intellectual property law and public policy.

A FINAL WORD

Intellectual property will surely survive the digital age, although substantial time and effort may be required to achieve a workable balance between private rights and the public interest in information. Major adaptations may need to take place to ensure that content creators and rights holders have sufficient incentives to produce an extensive and diverse supply of intellectual property. Policy makers and stakeholders will have to work together to ensure that the important public purposes embodied in copyright law continue to be fulfilled in the digital context. The information infrastructure promises the possibility of greatly improved access to information for all of society. We as a society share the responsibility for developing reasonable compromises to allow the nation to benefit from the opportunities it can bring.

