

Chapter 10

Strategic Choices for Congress

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Strategic Choices for Congress

PROBLEM FOR CONGRESS

The system of intellectual property rights and practices, as it has evolved in the United States, represents a balance of social, political, and economic interests that was arrived at over time and in response to changing historical circumstances. The basic framework was provided for in Section 8, Article 1 of the Constitution, which authorized Congress to grant exclusive ownership rights, for a limited period of time, for writings and inventions. The purpose of the grants of rights was twofold: 1) to foster the progress of science and the useful arts, and 2) to encourage the creation and dissemination of information and knowledge to the public.

Although this system of intellectual property rights was originally designed around the technologies of its time, the approach that it embodied was flexible enough to incorporate new technological developments as they appeared. Today, however, advances in technologies are so far reaching that they pose fundamental questions about the system itself. They raise issues, for example, about the appropriate goals of the system, the basic framework of the law, the mechanisms for enforcing rights, the criteria for granting incentives and rewards, as well as about the scope of the intellectual property problem itself.

Concerned about the problem that the new technologies pose, interested parties are urging Congress to initiate legislation to take these technological developments into account. Holders of existing intellectual property rights, for example, concerned lest the new technologies undermine their ability to enforce their property rights, are calling on Congress to provide new ways to assure their remuneration. Creators of new kinds of information products and services are requesting Congress to extend existing law to include their creative activities within its provisions. In addition, the creators and providers of goods and services that, prior

to the information era, were of little economic value are looking to intellectual property law to justify for themselves a greater economic recompense. Meanwhile, the general public, having greater expectations of, and growing increasingly accustomed to, the information products and services afforded by the new technologies, as well as their reduced costs and increased accessibility, are looking to Congress to preserve these gains.

Faced with a growing number of requests for congressional action, in addition to a ubiquitous and rapidly changing technology, the problem for Congress is to try to take the magnitude and the scope of technological change into account, while balancing interests and responding to present day concerns. The resolution of these issues maybe more difficult than in the past when information-based products and services were peripheral to the performance of many social and economic activities, and when people had lower expectations about their use and the profits that might be derived from them. In such an environment, issues involving the granting of intellectual property rights were easily worked out among the major players without much disagreement or public involvement.

Today, on the other hand, given the variety of opportunities that the new technologies afford, the increased value of information, changing relationships among the traditional participants in the intellectual property system, and rising expectations about the benefits of these technologies, the number of stakeholders with disparate interests and competing claims on the system will be greater than ever before. Under these circumstances, the resolution of intellectual property issues will be more problematic, requiring that more viewpoints be taken into account, and that policy decisions about the distribution of incentives and rewards be made much more explicit.

OTA APPROACH

It was to assist Congress in addressing these issues that the Office of Technology Assessment was asked to undertake this assessment, *Intellectual Property Rights in an Age of Electronics and Information*.

In thinking about how the new communications and information technologies might affect intellectual property rights, OTA has adopted an *abroad* approach, looking at the kinds of stresses that technology might place on the intellectual property system, as a whole, and on each of its parts. Such an approach was required because the new technologies do not necessarily have a direct effect on intellectual property rights. Rather, more often than not, their influence on the law is felt indirectly, as a result of such things as technologically induced changes in norms, values, and expectations, as well as in the ways in which intellectual works are created, produced, marketed, and distributed.

Such an approach has also been useful because, given the political intensity of the intellectual property debate today, and the high economic stakes involved, it is extremely important to view the situation in its entirety. Those involved in the policy debate have often defined issues narrowly, in terms limited to their own interests and world views.

Examining how the new information and communication technologies might affect the intellectual property system, OTA found that these technologies are creating a wide variety of opportunities and problems that, taken together, present Congress with five major strategic choices: 1) what policy goals to pursue, 2) whether and when to act, 3) what legal framework to use, 4) how broadly to define the problem, and 5) within what institutional framework should issues be resolved. These choices, and a description of some of the issues and options that they entail, are discussed below.

What Policy Goals To Pursue

Which policy goals a particular intellectual property system is designed to serve depends, in large measure, on history, circumstances, and the particular needs of a society at the time when such considerations are being made. Concerned primarily about building a nation, and thus about the need to establish communication links, develop a unified market, forge a common culture, and build a democratic polity, the Founding Fathers intended the granting of intellectual property rights to increase the flow of knowledge and information throughout the country. The granting of rewards was not considered to be an end in and of itself, but rather a means to achieve the goal of learning.

Given the changing role of information in society, the question is raised as to whether a goal established for an agrarian era is still appropriate in an information age. Because information-based products and services now constitute a major source of economic growth, and are essential to our balance of trade, some people, for example, are urging that the intellectual property system be restructured to give priority to economic goals. They propose a number of changes in the system that would presumably foster such a goal. One suggestion, for example, is to extend protection to information itself. Such protection, it is argued, would create a whole new source of economic wealth. Another proposal, designed to induce investment in information production, calls for the elimination of the requirement that inventions be reducible to practice, thereby allowing for the protection of ideas. Such types of protection have traditionally been denied on the grounds that they would inhibit the dissemination of knowledge and ideas.

There are others, however, who oppose changes designed to favor economic goals. Instead of

increased protection, they prefer to see the new technologies used to enhance access and the sharing of information resources. While acknowledging that the development of information-based products and services are important to the economy, opponents of stronger protection point out that information is equally important for social, political, and cultural purposes. Librarians and educators, for example, are concerned that, if treated primarily as a commodity, information will be less available for learning.

Looking at these issues, OTA found that the potential for conflicts among cultural, economic, and political goals is indeed heightened in an information age. The ease with which the system has historically been able to mutually serve all goals is no longer possible, given that the value of information-based products and services is being enhanced simultaneously in all realms of life. And even if, as some have suggested, increased intellectual property protection significantly increases the production of information and information-based products and services, it is uncertain whether goods designed primarily with a profit motive in mind would be the most suitable for noneconomic ends. Nor would their production in and of itself lead to their widespread distribution. For, as is pointed out below, producers of works distributed electronically do not have as much incentive to make them publicly available as do producers of works distributed in hard copy.

Conflict among goals may also increase because, viewing information as a new source of wealth, many people are looking for profit where they never have before. Given these heightened expectations of economic rewards, the amount of economic growth that might result from extending property rights may indeed be insufficient to eliminate conflicts about intellectual property goals.

In an information age, therefore, Congress will most likely have to make more explicit choices among policy goals. Alternatively, other policy mechanisms, apart from the granting of intellectual property rights, might be used to foster some goals not supported by the present system. For example, other kinds of

economic incentives, such as subsidies or tax exemptions, might be granted, which would have fewer negative consequences for learning and the creative environment,

Whether and When To Act

In making intellectual property policy, Congress has always had to reckon with technological change. Over time, Congress has altered copyright law to incorporate such technological developments as designs, engravings, and etchings (1802); photographs and negatives (1865); mechanical recordings (1909); motion pictures (1912); sound recordings (1972); computer software (1980); and mask works for semiconductor chips (1984). Then, in 1976, the copyright law was completely revised in an effort to deal, once and for all, with the impacts of technological change. This revision, however, failed to meet its objective. Almost as soon as it was passed, the new law was out of date.

With the new information and communication technologies, the pace of technological change is accelerating. Thus, once again, Congress is faced with choices of whether, how, and when to respond. Should Congress, for example, do nothing? Should it respond immediately to those needs deemed to be most pressing; or should it wait until it has a better understanding of the long-term impact of technology on the intellectual property system?

Should Congress Take Any Action?

Stakeholders in the system disagree about the extent and seriousness of intellectual property problems, and thus about whether Congress should take any action at all. Not particularly affected by the new technologies, many traditional copyright holders, such as book publishers, are satisfied with the system as it presently exists. Advocates of the free market approach also prefer that Congress take no action. They believe that, as markets develop, so too will natural solutions to the problems stemming from technological change. Others oppose change, fearing that major alterations in the law will be disruptive, and merely lead to greater uncertainty.

Holding quite a different position are those who call for specific changes in the law to be made in response to particular problems as they arise. Included in this group are, for example, people from the motion picture and recording industries who, although concerned about how technology affects their ability to enforce their rights, still want to profit from the new home market that the new technologies afford. To allow them to do so, they propose a royalty on the sale of blank tapes and recording devices. By assuring them remuneration, legislation of this sort would make their enforcement problems irrelevant. Similarly, television program suppliers would like to see specific changes in the law made to deal with problems they deem crucial to their interests. Believing that government rates are lower than those established in the market, they propose changes in the law that would require cable operators to bid for programming in the market place. Groups such as these, however, are generally reluctant to view intellectual property problems as being linked, and to make overall, structural changes in the system. Such an approach, they argue, will detract from those problems in need of immediate solutions.

Seeking more fundamental changes in the intellectual property system are those who are concerned lest intellectual property law be stretched to the point where it can no longer be consistently applied, or meet its intended policy goals. This view is heard most frequently among members of the legal and judicial communities. Such people are most outspoken in opposing the provision of copyright protection for computer software. Noting that reverse engineering may be precluded under copyright law, they argue that the extension of such protection may actually serve to inhibit learning and innovation.

When To Act

Decisions about when to act are clearly related to decisions about whether to act, and to decisions about whether to deal with problems separately, as they appear, or in a comprehensive fashion. Thus, those who favor a specific piece of legislation designed to deal with a particular problem also tend to press

for action now; whereas those concerned about the overall system are willing to postpone action until Congress has the information and understanding required to deal with intellectual property issues as a whole.

In considering these choices, OTA found that technological developments are, indeed, affecting the intellectual property system in all of its aspects. Moreover, because we are now only just beginning to move into an electronic era, the full impact of the new technologies will not become completely apparent for some time to come. Thus, even if Congress decides to act in some areas now, it will need to be prepared to reconsider these actions at some point in the future. Acknowledging that this is the case, however, it is still useful to distinguish between short-, mid-, and long-term problems, because different kinds of problems may merit different kinds of solutions.

Short-Term Problems.—A number of problems can be considered to be pressing on the grounds that stakeholders are seeking immediate legislative action, that societal stakes are particularly high, or that technological change is occurring so rapidly that, if Congress wants to deliberately channel its impacts, it will have to act sooner rather than later. OTA has identified three such problems: the problem of enforcement, the problem of private use, and the problem of functional works.

The Problem of Enforcement.—One problem that will require attention in the short term is that of enforcement. Taken together, improvements in the cost, speed, and capabilities of information technologies are undermining the mechanisms by which intellectual property rights have traditionally been enforced. Devices such as optical disk storage systems may allow individuals to collect entire libraries of works in their homes. Under laboratory conditions, moreover, fiber optic technology is now capable of transferring 100 average-length novels over a distance of 150 miles in 1 second. Such capability can be expected soon in systems that are available to the public. Technology is also making the copying, transfer, and manipulation of information and intellectual works more private. Personal computers can store, process, and communicate the entire con-

tents of commercial databases without the knowledge or consent of the compilers of such works. In the face of these developments, copyright holders are finding it harder to detect, prove, and stop infringements.

If this problem remains unresolved, creators, producers, and distributors of intellectual properties may become increasingly reluctant to distribute their works in forms over which they have little physical control. Moreover, if piracy becomes the norm, the legitimacy of the intellectual property system may itself be called into question, and the opportunities for policymaking in this area significantly reduced.

Information technologies provide proprietors with some technological options for dealing with enforcement. Private, computerized, electronic systems, for example, allow proprietors to maintain control by limiting and monitoring access. The government might provide support for such options were it, for example, to provide industrywide standards for these technologies. Standards such as these, however, may be very difficult to impose, since they would require a cooperative agreement between hardware and software producers. A number of proprietors, moreover, would rather maintain their freedom of action than receive such support. Nor are such kinds of solutions particularly popular among consumers, who feel that they would reduce the value of the product and perhaps constitute a threat to their personal privacy.

Recognizing that technological solutions may make their products less appealing to the consumer, a number of copyright holders are now calling on Congress to establish new ways of insuring their remuneration instead of new mechanisms for enforcing rights. The most frequently mentioned proposal of this kind is a royalty, or tax, on blank audio and video tapes.

Based on interviews with and surveys of the public, OTA found that many people would be reasonably disposed to such an option. They favor a law that would allow them the freedom to copy, without making them personally responsible for making judgments about the propriety of their actions. One of the unintended

consequences of such a law, however, might be to encourage private copying.

Unlike consumers, however, hardware producers are adamantly opposed to options that would add a surcharge to their products. They argue that, before any such proposals be adopted, much better estimates of damage need to be made, and these estimates need to be weighed against the benefits that copyright holders gain from the new markets that hardware such as videocassette recorders provide.

Decisions about whether or not to seek new ways to provide incentives to creators and producers of intellectual works will also need to take into account the Federal administrative requirements and costs that such steps might entail. Given the current nonregulatory climate in the country, and recent efforts to curtail the activities of the Copyright Royalty Tribunal—the only Federal institution currently involved with distributing intellectual property royalties—it is difficult to imagine how existing institutions might effectively administer such a policy.

In light of the problem of enforcing intellectual property rights, public support for the underlying principles of the law will become increasingly critical. However, at present, the average citizen is quite unaware of the issues involved. A recent OTA survey of the public found, for example, that over two-thirds of those surveyed said that they were not at all, or were only slightly, familiar with the subject. Moreover, an equal proportion felt that intellectual property issues had very little to do with them personally. Notably, however, those who owned home technology, or who were under 40, were more aware of the issues. It would appear, therefore, that Congress has a brief window of time in which to establish policy. Under these circumstances, policymakers may want to undertake a dialog with the public in order to ascertain its viewpoint and to enhance its understanding of what is at stake for members of the public in the present debate over intellectual property issues.

The Problem of Private Use.—A second short-term problem is that of establishing pol-

icy for the private use of information technologies. As is the case with enforcement, if Congress does not take the initiative in this area now, it may be unable to do so later, when public attitudes and behaviors have become more entrenched.

Technology is spawning whole new opportunities in the development and use of information-based goods. A central question for intellectual property law is who shall benefit from these opportunities. In the Supreme Court's "Betamax" decision, for example, the question was whether proprietors or users would benefit, either directly or indirectly, from home videorecording capabilities.

As even newer technologies affect individuals' ability to copy, store, and modify information, such questions are likely to multiply. However, because it evolved in a period when duplication and storage technologies were centralized and deployed in a commercial context, copyright law offers little guidance to courts in resolving such conflicts. Neither the existing framework of rights, nor limitations on those rights—such as the fair use doctrine—clearly apply to the private use of information-based goods.

Stakeholders strongly disagree about who should benefit from new opportunities. Copyright holders would like to profit from the expanded home use of intellectual works. Moreover, they argue that, given the new technologies, private use, considered in the aggregate, will cause them extensive harm. Users, on the other hand, view the new technologies as a boon, reducing their costs and increasing their access to intellectual works. As the OTA survey of the public illustrates, while acknowledging that copying is wrong when done for profit, or as a part of a business, most people see private copying of copyrighted works as being acceptable. Producers of copying equipment also oppose restrictions on private use.

Some survey research has been conducted on the financial benefits that would accrue to proprietors if they were remunerated for new technological uses. OTA found, however, that estimates of harm such as these are, in and of

themselves, insufficient to help Congress resolve the issue of who should benefit from new uses, since they presuppose—and cannot be the foundation for—a legal right to profit from the new uses of copyright works made available by technology. Whether Congress wishes to consider new uses as harmful will depend on the goals that it seeks to promote through copyright law, and where it believes the benefits of new technologies should be allocated.

The Problem of Functional Works.—Functional works, such as computer programs, artificial intelligence, and algorithms also present problems for the law that will need to be resolved within a short timeframe. Neither copyright nor patent law is entirely appropriate for such works. And, because they are very costly to develop, there is a strong incentive for industries to pirate them. For these reasons, it is generally agreed that rules governing their protection will be required shortly, if these works are to be developed and widely deployed. The resolution of this issue becomes increasingly important, moreover, as these works come to play a dominant role in domestic and international economies. Potential options for dealing with functional works are described below, in the discussion of the legal framework.

Mid-Term Problems.—Other problems, although no less important, are less ripe for immediate action. Included in this category might be, for example, the problem of assigning value and distributing rewards in cases of derivative use, that of protecting the integrity of works in an electronic environment, and that of attributing and assigning authorship when works are generated by means of interactive or electronic processes.

Engendered by technologies still in their infancy, these problems are only now just emerging, and our understanding of them is severely limited. Sound government policy requires an accurate understanding of how information markets operate and of the role that these technologies might play in the creative environment. Yet, at present, such an understanding does not exist. Although there have been a few

isolated efforts at collecting comprehensive data about information-based commodities, there is neither enough data nor sufficient quantitative analysis on which to make sound policy judgments. Most data is fragmentary, incomparable, and available only through interested parties.

As the new technologies are developed and deployed, however, these problems, and the issues to which they give rise, will become more and more pressing. New participants will enter on the scene, as new technological opportunities appear. Not party to previous intellectual property agreements, many of them will have their own distinct attitudes about who should have access to works and materials, and about what kinds of activities and pursuits should be rewarded. These new stakeholders will lobby to have their needs and their perspectives taken into account. As a result, new controversies about the intellectual property system are likely to arise.

The Problem of Derivative Use.—The new technologies multiply the possibilities of creating new works from old ones. Using computer and video technologies to electronically snip and paste, for example, a film artist, can rearrange footage in the same way a writer rearranges words on his word processor: inserting and deleting images, frame by frame; taking whole sequences from one place and shifting them to another; scrolling through sequences again and again. All this is done in a matter of seconds. In the same fashion, all information content can serve as the basis for new derivative products and creative works.

With these capabilities to store, retrieve, and manipulate information, there come a multitude of new opportunities to expand the variety, scope, and sophistication of information-based products and services. Taking advantage of these opportunities, the information industry—database businesses, software and hardware providers, publishers, cable television, information analysis centers, and clear-*inghouses*—has grown rapidly in the last few years. In the domestic software industry alone, for example, there are now an estimated 1,200

companies and thousands of individual freelancers creating and producing software, and providing services worth some \$40 billion annually.

Given the growth of opportunities to create derivative works, issues will emerge with respect to who shall profit from them. Under existing intellectual property law, copyright holders have the right to benefit from all works based on their work. And, clearly, copyright holders want this right to extend to all new uses of their work. Many of those who are secondary information providers, however, oppose this point of view. In an information age, they argue, the most valuable information is that which is the most appropriate and the most timely. Custom designed, formatted, or packaged, this kind of information is by its nature derivative. To encourage its development and use, they claim, incentives and rewards must be provided not as they have in the past to the original creators, but rather to those who, making *use* of the new technologies, add new economic value to intellectual works.

The Problem of Artistic Integrity. —The ease with which information can be electronically snipped and pasted raises problems for creators, not only with respect to how they can assure a profit from their works, but also with respect to how they can safeguard its integrity. For the same images and sounds that the artist, photographer, or musician stores to be re-used for his or her own purposes, can be accessed, manipulated, revised, copied, and used in a multitude of ways by others, with or without permission. Some creators worry that, under these circumstances, a “cavalier attitude will develop toward taking whatever you want and doing whatever you want with it. Such an attitude is already evident in the worlds of advertising and publishing as well as in the artistic community itself. Moreover, the scope of this problem is likely to increase as these technologies become cheaper and more widely available.

In the United States, intellectual property law has traditionally been unconcerned with protecting the integrity of a creator’s work.

In the new electronic environment, however, creators may become as concerned about the integrity of their works as they are about their profits. If, in the future, intellectual property protection is to be an effective incentive for creativity, it may need to secure artistic integrity as well as financial rewards.

The Problem of Assigning Authorship and of Measuring Value Added.—To effectively grant and to equitably distribute intellectual property rights requires that authorship or invention can be clearly assigned, and that new value added to intellectual works can be accurately measured. Today, however, because of the fluid, interactive, and functional nature of the new technologies, it is becoming increasingly difficult to perform either of these tasks. With intellectual works being simultaneously created, published, and communicated over electronic networks, the possibility of discovery or invention on-line, once a vision of the future, is now a reality. Such a development greatly complicates the process of determining originality and authorship, and of assigning rights. Similarly, with advances in artificial intelligence, computer-aided design, and computer-generated software, it will become more and more difficult to determine what creators have actually created. Given these trends, it is likely that, in the future, the number of controversies about the distribution of rewards is likely to increase. Moreover, as the economic value of information-based products and services increases, such disagreements may become all the more intense.

Long-Term Problems.—Even if a number of issues are effectively dealt with in the short term, another major revision of intellectual property law can still be expected in the future. Fundamental changes in technology are now taking place. And, although technology, for the moment, is multiplying the forms that works can take, and the means by which they can be transmitted, eventually all works will become available in compatible, digital, computer-processible form. Such developments will not only antiquate many of today's solutions; they may also give rise to new problems requiring new kinds of answers. For, as more and

more works appear in digital form, the scope of today problems may expand so greatly so as to alter their very nature.

In the short term, for example, the enforcement problem may be amenable to a solution that requires a royalty on blank tapes. Although it might be difficult to establish an administrative structure to collect and distribute such royalties, the task is not an impossible one. However, if such an administrative apparatus had to be expanded to deal with the increasing number of works delivered on-line, the problems of effectively executing such a scheme may be so great as to, perhaps, negate the solution itself.

Another problem that will probably take on more importance in the future is that of access. For, as is described below, when works are intangible in their form, copyright holders may, under some circumstances, be able to restrict access to them. Such a problem may not warrant legislative attention now, because its extent is limited. However, if and when intangible works become the norm, the problem, being cumulative, may loom much more serious.

What Legal Framework To Use

The intellectual property system was carefully designed to balance the public and the private interest. Because the new information and communication technologies do not fit neatly within the existing framework of the law, the balance may be harder to achieve in the future. Questions arise, therefore, with respect to how the new technologies should be dealt with according to the law, and whether or not a new conceptualization of the law may be required. Two particular problems that OTA has identified in this regard are the problem of functional works, and that of intangible works.

Patents, Copyrights, and Functional Works

Traditionally, intellectual property law provided two basic forms of protection: patent law and copyright law. These schemes reflected a basic distinction between invention and authorship. Inventions are essentially useful

devices or processes, whereas works of authorship convey information or ideas. And, although both schemes encouraged the production and dissemination of ideas, they did so in two different ways. Patent required disclosure, and copyright required publication. Moreover, the types of protection granted reflected the differences between inventions and writings. Copyright prevented commercial copying; patent prevented commercial use.

The clear distinction between inventions and writings is beginning to break down. With the new technologies, writings act like inventions. Although considered to be writings, computer programs, for example, can run machines. They can, moreover, create new programs, and even control industrial processes. In the future, information itself will play a functional role. A piece of information entered into a database in one city, for instance, may automatically retool a factory in another. These developments raise questions about whether these new information-based products can be accommodated within the old legal framework, or whether some new categories of protection might not be required.

A subject of debate since the mid-1960s, this question has defied conclusive resolution. Some people believe that a 1980 amendment, incorporating computer programs into copyright law, adequately settled the issue. This is the view, for example, espoused by many traditional copyright lawyers and by representatives of the computer hardware and software industries. However, a number of lawyers, many with engineering backgrounds, now challenge the wisdom of this approach. They argue that computer programs are hybrid works, sharing traits of both patentable and copyrightable works. They fear that, if the law is not revised, not only will functional works be inadequately protected, but also the sharing of ideas and knowledge, necessary for innovation, will be curtailed.

Looking at this question, OTA found that the distinction between writing and inventions is indeed breaking down with respect to functional works such as computer software and

semiconductor chip masks. Because there are many kinds of these works, they may require their own framework for protection. Included within this category would be works of artificial intelligence, algorithms, firmware, and recombinant DNA. Like computer software, these works use information to affect a process.

The *sui generis* law for protecting chip masks might serve as one model for such works. OTA findings suggest, however, that it might be better to develop a more comprehensive approach that would treat functional works as a major, separate class of intellectual property law. Taking into account the particular characteristics of functional works, the law might be more accurately targeted to achieve specific policy outcomes, and thus serve as a more robust policy tool. Moreover, with a new category of law, both producers and users would face less uncertainty each time a new type of functional work were introduced. In addition, if the law were reconceptualized now, it might be possible to address a much older problem in copyright—that of distinguishing between artistic and factual works, a problem which is becoming more troublesome in the light of the new technologies. OTA suggests that a fruitful basis for such a revision might be found in the distinctions between works of art, works of fact, and works of function.

Copyright Framework and Intangible Works

The copyright system was based on the attributes of a print culture: works were fixed in a tangible medium; they were expensive to reproduce on a large scale; and, in order for the creator to profit from his work, he had to publish it in copies. A novel, for instance, had to be set in type, printed, and bound. Because of the expense entailed, copying was a commercial venture. A conspicuous activity, it was relatively easy to police. Moreover, because the only way of selling such a work was to sell copies, public dissemination went hand in hand with profit-making. Although the author retained the right to print and publish the novel, he relinquished control of copies of it with each sale. This promoted both the interest of the proprietor as well as that of the public.

Works disseminated through electronic media are different from traditionally printed works. And their unique characteristics make it more difficult to balance public and private interests through copyright. Unlike a novel, a television program or a database entry need not be fixed in a copy to be sold. Thus, its creator or proprietor does not have to disseminate 'copies in order to profit from them. Under these circumstances, the proprietor retains control over access to his work, and may decide to intentionally restrict it in order to enhance his profit. Were this to occur, the public interest may suffer.

On the other hand, technology may also favor the user at the expense of the copyright holder. New reproductive technologies, such as audio and video recorders, are now widespread, allowing many individuals to cheaply and easily copy intangible works. If these privately made copies compete with sales of the original works, the proprietors' profits may be significantly diminished.

Whether, in any given situation, it is the proprietor or the public who will suffer is extremely hard to determine. Indeed, under certain circumstances, both parties may jointly benefit from advances in technology. Generally speaking, however, it is clear that, given the growing number of works being distributed electronically, it will now be harder to achieve the balance between the public and the proprietors interest under the copyright system.

How Broadly To Define The Problem

Historically intellectual property issues were somewhat isolated policy concerns. Because information did not assume the same social and economic importance that it does today, intellectual property decisions were less likely to impinge on other areas of public policy.

OTA found, however, that intellectual property policy can no longer be separated from other policy concerns. To the extent that information is, in fact, central to most activities, decisions about intellectual property may be decisions about the distribution of wealth and

social status. Furthermore, given the unlimited scope of the new technologies, and the growing trade in information-based products and services, U.S. intellectual property policy is now inextricably tied to international affairs. Communications policy, too, is now linked to intellectual property policy as more and more intellectual property is being transmitted via media such as cable television, telephone lines, and communication satellites. Today, moreover, intellectual property issues give rise to concerns about privacy, as copyright holders seek technical means to monitor use. In making decisions about intellectual property policy, therefore, a whole new range of considerations will need to be taken into account, and decisionmakers in all these areas will need to strive for greater coordination.

Within What Institutional Framework Should Intellectual Property Issues Be Resolved?

Traditionally the intellectual property system required little institutional support. The system was designed to be self-enforcing: the government granted rights and registered works, while individual creators and users were responsible for protecting their rights.

As the previous findings demonstrate, however, the system is no longer so simple. Technology is creating new demands. Many more people with disparate interests are making claims on the system. Technology is advancing faster than the law and institutions can adapt. More and more, laws are being proposed that require that government play a regulatory role. In addition, given the growing complexity and diversity of information markets, more information is needed to make sound public policy decisions. The need for policy coordination is also greater as intellectual property issues converge with other issues.

This institutional question has not been widely discussed among stakeholders. In the current anti-regulatory climate, many are reluctant to recommend the creation of new institutions. For example, the proposed legisla-

tion to impose a royalty on blank tapes and recording equipment would require that the Copyright Office collect monies and that the Copyright Royalty Tribunal distribute them—this despite the proposed dissolution of the Copyright Royalty Tribunal. Similarly, the recent passage of the Semiconductor Chip Act requires a patent-like examining procedure in the Copyright Office, even though it has no such expertise,

OTA found, however, that intellectual property issues cannot be resolved without dealing with the question of institutional capabilities and change. In the absence of institutional change, the courts will increasingly be called on to resolve highly complex technical issues and to make policy in this area. The judiciary, however, may not be the best suited for this role.

The pace of technological change will continue to put pressure on existing institutional arrangements. One way of dealing with such stress might be to establish a central governmental agency to address intellectual property issues as they emerge. Such a step would be consistent with an approach that deals with immediate issues in the short term, while preparing to address longer term issues later. Such an agency might, for example, monitor technological change, and assess the ways in which the law might deal with it. It might, moreover, provide the necessary expertise to deal with complex technologic issues and collect and analyze information about information markets and information use. It might even assume a regulatory function, distributing rewards or adjudicating disputes. Finally, such an agency might coordinate intellectual property policy with policy in other, related areas.