

A BILL OF RIGHTS FOR ELECTRONIC CITIZENS

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I. INTRODUCTION

A. Prologue--Technologies of Freedom

The regulation of electronic communication is not entailed in its technology but is a reaction to it. Computers, telephones, radio and satellites are technologies of freedom, as much as was the printing press.¹

Information technologies are not simply new formats for traditional forms of intellectual property. Rather, policies governing information technologies must be anchored in the understanding that they are technologies of freedom. Just as the First Amendment establishes freedom of the press in the print media, an essential task of our generation is to create "A Bill of Rights for Electronic Citizens" which will define the kinds of freedoms and responsibilities appropriate to an information society.

The term "electronic citizens" points to the growing political significance of new realms of speech based upon electronic media. Recent events in China and Eastern Europe suggest that information technologies are a powerful medium for political speech. Yet when we observe recent legislative and judicial deliberations about information technology in the United States, we find them narrowly focused on concepts of property derived from a print society nearly four hundred years old. Certainly there are vital property interests involved here, but more fundamental is the perspective that these are technologies which have vital consequences for the political and economic health of our nation. To emphasize this point we propose issues and questions to guide the development of a "Bill of Rights for Electronic Citizens."

B. Purpose and Themes

The goal of this paper is to reorient current thinking about how "intellectual property rights" may apply to the new electronic environment. A selection of current trends, issues and problems are identified and discussed to confirm the significance and urgency of developing new ways of thinking, new policies, and an agenda of new programs and projects.

This paper is a discussion document, intended to raise questions and stimulate debate. We hope its readers will be moved to reconsider and analyze current trends from a fresh

¹ de Sola Pool, Ithiel, *Technologies of Freedom*, Harvard University Press 1983, p. 229.

emerged from laboratories and high technology environments; however, the microcomputer is now providing access to information resources to citizens at large. The National Research and Education Network (NREN) and other technological advances are much more than technical achievements; they can change the nature of the polity itself.

However, the great cost and complexity of information technologies pose the danger that the vast majority of citizens will find the new infrastructure more of a barrier than a gateway to new information resources and tools. The notion of a Bill of Rights is intended to focus as much attention on the access rights of citizens as has been focused upon the property rights of information providers.

3. *The Limits of the Concept of "Intellectual Property"*

The laws, ethics and values which have successfully regulated a print society can only be successfully adapted to an information society through a fundamental rethinking of the entire system. Perhaps the most succinct statement of the need to reorient the concept of "intellectual property" was made by Harlan Cleveland: *"How can 'intellectual property' be 'protected?' The question contains the seeds of its own confusion: it's the wrong verb about the wrong noun."*²

A new conceptual framework is necessitated by the rapid increase in the technological capability, availability, and use of computers and computer networks for the aggregation, organization, and distribution of information. The growing likelihood of the creation of a new national resource, the National Research and Education Network (NREN), is another example that technology is, once again, outstripping policy and law.

We present the needs of education not to plead for special exemption from the intellectual property system, but to suggest that within education is an alternative model for managing knowledge in the national interest.

The spread of education erodes the power that once accrued to the few who were "in the know." Information cannot be owned, though its delivery service can. Giving or selling information is not an exchange transaction, it is a sharing transaction.

The word "communication" comes from the Latin, *communicare*, which does not mean to communicate; it means to share. The information environment is a sharing environment. We are going to have to rethink the very basis of copyright and patent law, the distinction between public and private enterprise, and the notion that states "own" what their citizens or officials have discovered.

If the dominant activity of modern civilization is to be the sharing of symbols, rather than the exchange of things, is it not about time we created a new framework—a new economics, a new body of law, a

² Cleveland, Harlan, "How Can Intellectual Property" Be 'Protected?' " *Change-The Magazine of Higher Learning*, May/June 1989, p. 11.

4. *The Need for New Policies and Regulations that Do Not Foreclose Experimentation*

History shows that vested interests have always tried to subject technological innovation to traditional modes of control and have often delayed change for substantial periods of time, but have rarely succeeded permanently in forcing new technologies into the mold of the old. While we cannot forecast the future, we can see that the period of tolerance for experimentation must be extended before new media are regulated too closely.⁵ In addition, the modes of expression appropriate to information technology are only beginning to appear, being invented informally by users of the new systems. These modes must have time to develop.

Further, current attempts to extend traditional copyright law to new digital intellectual products such as computer software have already reduced the opportunity of most purchasers to make the most "natural" and cost-effective uses of those products. For example, placing multiple copies of a software package on the several microcomputers likely to be used by one purchaser is prohibited to protect the right of the publisher to maintain a fee system developed for printed materials: collecting fees based on counting copies.

To cite the wise counsel of Ithiel de Sola Pool once more, "so too with electronic publication networks, a normative system must grow out of actual patterns of work. The law may then lend support to these norms."⁶

Without new legal, social, and economic mechanisms that provide space for experimentation, the great political, economic and technical potential of information technologies are unlikely to be realized soon enough in our nation.

5. *Call to Action to the Educational Community*

The inability of educational institutions to prepare students adequately for the 1990s through a continuation of traditional practices is becoming apparent. Many fear that the schools and colleges may be even less able to prepare students and citizens for the next century. Instead of falling further behind other sectors of our society in the integration of computing, education should be a leader in adopting new technologies and setting behavioral standards for their use.

We must move to address four important unmet needs; we must:

- Develop new economic mechanisms for sustaining intellectual efforts,
- Develop new ethics and guidelines,
- Provide representation for all constituencies, and
- Provide a forum for the voice of education in the development of the successor to the present intellectual property system.

⁵ It would be interesting to review how the printing press was restricted from use for political and intellectual experimentation at the time of the American Revolution. Cf. the Zenger incident.

⁶ de Sola Pool, *op. cit.*, p. 249.

The reasons for making clearer distinctions among decisionmakers, stakeholders, current users of information technologies, and potential users are explored. Distinctions among creator/producers, publisher/distributors, and users of intellectual products are also examined.

Section VI. CONCEPTUAL FRAMEWORK AXIS 3: CONTROL AND INFLUENCE MECHANISMS—Intellectual Property and Intellectual Exchange Systems

Although we cannot anticipate the new conceptual system which will adequately govern information technologies, we undertake a critique of the present conceptual system based upon the concept of "intellectual property." The term "intellectual property" translates a wide realm of discourse into a limited legal language which evolved to regulate copyrighted printed works. We prefer using the term "intellectual products" to refer to the entire domain of the useful productions of the mind. We use the word "products" to preserve a focus on the useful objects produced by human intelligence. We call those intellectual products that are represented digitally within an electronic environment "digital intellectual products."

Some products can usefully be regulated by the property system, and some cannot. "Intellectual property" is one important concept for defining relationships between people and intellectual products, *but it is not the only important basis for defining those relationships*. We use the broad terms "intellectual exchange" and "intellectual exchange systems" to refer to the exchange of intellectual products that is not within a commercial market or property system.

The national interest dictates that both systems—exchange and property—should operate side by side on the national network. Much of the problem of regulation occurs when an intellectual product within one of these systems is appropriated by the other: i.e., when copyrighted intellectual property is copied and distributed freely; when public domain information is copyrighted or patented and removed from the public realm. Still, it is essential that the national network be heterogeneous in content: commercial and public sector resources; individual and collaborative works; private and institutional resources.

We describe some of the important ways that intellectual products have been created and regulated *within the non-profit sector*, primarily by the educational sector, explicitly for the purpose of the creation and dissemination of knowledge through research and teaching. Patterns noted within the educational sub-culture suggest the necessity for maintaining options for exchanging goods and services *outside* the dominant legal and economic property-based regulation system.

Section VII. TOWARDS A BILL OF RIGHTS FOR ELECTRONIC CITIZENS

Issues and questions to guide the development of a Bill of Rights for Electronic Citizens are proposed for discussion and modification by the many constituencies with interests in information technology. A process for completing the task is sketched.

Section VIII. THE FUTURE

Default: What happens if nothing is done to develop and enact these rights? Especially with respect to the evolution of the NREN? Some of the consequences of permitting the present intellectual property system to continue unmodified are described, especially the likelihood of severely limited access to digitally represented information and tools for most citizens.

II. THE NEED FOR A NEW CONCEPTUAL FRAMEWORK, BILL OF RIGHTS, POLICIES, AND ACTION AGENDA

A. Introduction—From Concepts to Policies to Actions

The selection of themes and topics dealt with in this paper has not been arbitrary and has not arisen solely from abstract reflection. On the contrary, we have been led to these ideas by our awareness of increasing concern among our colleagues about problems and issues related to "intellectual property rights." Many of those encountering these difficulties do not yet consciously link them to "intellectual property rights" or to some of the other broad concepts we are exploring here; however, the connections are significant and apparent from the perspective we advocate. In this section we try to link empirical concerns with a broader perspective, since the current intellectual property system does not provide effective tools for recognizing, understanding, addressing, and solving these concerns.

The conceptual framework, "electronic bill of rights" ideas, and formulation of themes and needs offered elsewhere in this paper should facilitate developing policies and initiating actions to address the illustrative problems and issues described below.⁸

B. Problems and Issues—General and Educational

1. Information Resources, Formats, and Technology

- *Range of Digital Information Products.* It may soon be *technically* possible for any student, teacher, or researcher to have immediate electronic access from any location to retrieve and manipulate the full text (including pictures) of any book, sound recording, or computer program ever published — and more. When almost any kind of "information" in almost any medium can now be represented and processed with digital electronics, the range of things that we are tempted to consider and treat as "intellectual property" is mind-boggling.
- *New Characteristics of Digital Products.* Digital products have characteristics different from those existing entirely within the print system. These characteristics give digital works their special value: they are flexible, they encourage collaborative work, they make readers into writers, and so forth. However, such new formats and forms of knowledge (e.g., electronic conferences on a national computer network) create new kinds of problems and rights.
- *Authentication of Electronic Documents.* It is already increasingly common for individuals or groups to distribute results of their work in electronic format before "published" print versions become available. In some cases, no print version is ever formally published. In this set of circumstances, will it be desirable and feasible to maintain authentication procedures—the capability of identifying an "official" version of a document?

⁸ See the special issue of May/June 1989 issue of *Change-The Magazine of Higher Education*, Can "Intellectual Property" be Protected? for a lengthier discussion of these issues and others closely related, including: Harlan Cleveland, "How Can "Intellectual Property" be Protected?"; Francis Dummer Fisher, "The Electronic Lumberyard and Builders' Rights"; and Steven W. Gilbert and Peter Lyman, "Intellectual Property in the Information Age."

The paramount need is to balance the interests of current stakeholders and future users of the digital infrastructure as it evolves. Survival of the fittest is the wrong model.

- *Balance Interests of Faculty and Commercial Publishers in Developing Software.* Is it possible and desirable to decrease the barriers and disincentives to faculty for developing academic software, while increasing the rewards to commercial software publishers for developing and distributing software within the higher education market? In addressing this issue it is important to distinguish among different kinds of software useful for different purposes within higher education.¹⁰

3. Control and Influence Mechanisms

- *Distinguishing Between "Protecting Property" and "Rewards."* What are the implications of "rewarding those who produce and distribute digital intellectual products" as opposed to "protecting intellectual property?" Protection against "unfair competition" in the marketplace is good; protection against reasonable, natural use of technology's capabilities is doomed. Is a consensus solution among key stakeholders even remotely conceivable?
- *Copyright Law Overhaul.* Copyright law will succumb to irresistible, irreversible change in technology. "Counting copies" will cease to be a viable basis for the mechanism for transferring resources from users to creators and publishers. New mechanisms are needed to provide economic support both for those who create and those who distribute information.
- *Fair Use.* How can "fair use" be appropriately redefined in this new environment? For individuals as well as for educational institutions? Can "not creating commercial loss" be an important component of the new definition? What are the current limits to its application for each of the key stakeholders? Under what limitations to educational or personal use would decompilation become acceptable? Are these limitations enforceable? Enforceable enough?
- *Scholarly Publication.* Will the more prestigious journals, unbounded by page limitations in a new electronic environment, "swallow up" smaller journals? To whose benefit or detriment? How will the peer review process be used and monitored? What scholarly usefulness does the feasibility of "forward" references or citations have? Will "official" versions of a document show linkages and uses created by subsequent readers? What implications does this have for concepts of rights to privacy?
- *Implementing Mass Collaboration.* National networks provide opportunities for "mass collaboration" on the preparation of documents—collaboration on an unprecedented scale both of large numbers of participants and of short time intervals between draft versions. In such processes, who will have responsibility for and control of archival functions? How will the meaning of authorship change in this environment? How will the attribution of credit be determined and made known? How will authors—however defined—maintain the integrity of their work after it becomes accessible on the network? (i.e., how will so-called "moral rights" of "paternity" and "integrity" translate into this environment?)

C. Problems and Issues—NREN

¹⁰ Gilbert, Steven W., "Academic Software-Vision and Perspective," *EDUCOM Bulletin*, Vol. 20/No. 2/Summer 1985, pp. 18-21.

interchanges, using the nation's vast data banks as the building blocks for increasing industrial productivity, creating new products, and improving access to education. Libraries, rural schools, minority institutions, and vocational education programs would have access to the same national resources—data bases, supercomputers, accelerators—as more affluent and better known institutions.¹²

NREN has been described as the electronic equivalent of the national highway network, and rightfully so in that the commerce of the twenty-first century will increasingly be based upon the many forms of digital information. Indeed, information is valuable only in being communicated, and NREN will be not only a technology for communication but also an important new element of the infrastructure for an economy and society based upon electronic communication.

And yet, there is a fundamental difference between a national highway system and a national network: the highway system is used by diverse groups of citizens for many purposes, with relatively few access costs; *without careful planning to achieve widespread access and use*, a national network will be used by a relatively homogeneous and elite community of scientific researchers for a relatively narrow range of purposes. We are advocating an approach that will enhance the likelihood of access to NREN by groups which have not been participants in its planning, and for purposes that are not well-represented by the legal concepts and commercial interests of those who have thus far been most actively working to influence the evolution of the intellectual property system.

- *NREN as Two-Way Communications System.* In oversimplified terms, NREN is a delivery system. It accepts creations, packages them and delivers them to distant consumers. However, it is precisely the two-way communication capability of NREN and of the larger emerging digital infrastructure that makes the traditional print-based intellectual property system inadequate. In the new environment, "consumers" of information rapidly become creators and distributors as well.

- *Access Costs.* The initial and on-going costs associated with using the NREN will strongly influence how widely, frequently, and effectively it is used. What forms of charging for use, if any, will be made? How will information suppliers and distributors be compensated?

- *Property System Issues.* For the property system aspects of NREN to operate effectively it will be necessary to have mechanisms to: track and allocate costs for value-added services; track the use of works as they are incorporated into derivative works; provide reliable certification that a particular document is proprietary, public domain, private, or whatever; etc.

- *Exchange System Issues.* For the exchange system aspects of traditional academic activities to operate effectively within NREN, it will be necessary to have mechanisms to validate and certify "documents"; i.e., to provide users with a

¹² *Information Technology Quarterly*, Summer-Fall 1989, Vol. VIII, Nos. 2&3, "Toward an Information Infrastructure, An interview with Senator Albert Gore, Jr.," p. 33.

structure of rights will be determined, in part, by the policy goals of the system, and by the mechanisms chosen to achieve them.¹⁴

...

In addition, because people creating different forms of intellectual property operate in different environments and have varying concerns, they may respond best to different kinds of inducements.¹⁵

Clearly the legal, economic, and technical concepts and tools for analyzing intellectual property rights have a valid place in thinking through the consequences of a national network for the creation, publication and use of ideas; however, those approaches are already well-represented in current discussions. This conceptual framework was a valuable contribution, but a new one is necessary.

Current discussions of "intellectual property rights" most often appear to be from one of three distinct perspectives—legal, economic, or technical. Legal models assume intellectual products to be imbued with the characteristics of property, moderated by social goals of making works widely available and rewarding individual creativity. They are things to be treated before the law as property subject to the precedents and limits of case law within our systems of copyright and patent. Economic-based analyses view intellectual products from a resource or transaction perspective. These emphasize rights of owners and conditions under which the products may be transferred. Shrink-wrap licenses, site licenses, user fees, return on development costs and capital investments are the focus. Technically-based analyses stress the technical aspects of development processes for intellectual products and the technical characteristics of the system that stores and distributes the product: line speeds, interface protocols, standards, and security.

Considering the intellectual property system only from legalistic, economic or technical perspectives forces the analyst to view the system from the narrowness of the control mechanisms, and to adopt a vocabulary and framework that are severely limited. The resulting analysis cannot avoid inappropriately emphasizing points central to those particular perspectives and simultaneously deemphasizing factors critical to other perspectives. Control mechanisms should facilitate the achievement of the goals of the system, not be the sole basis for analysis.

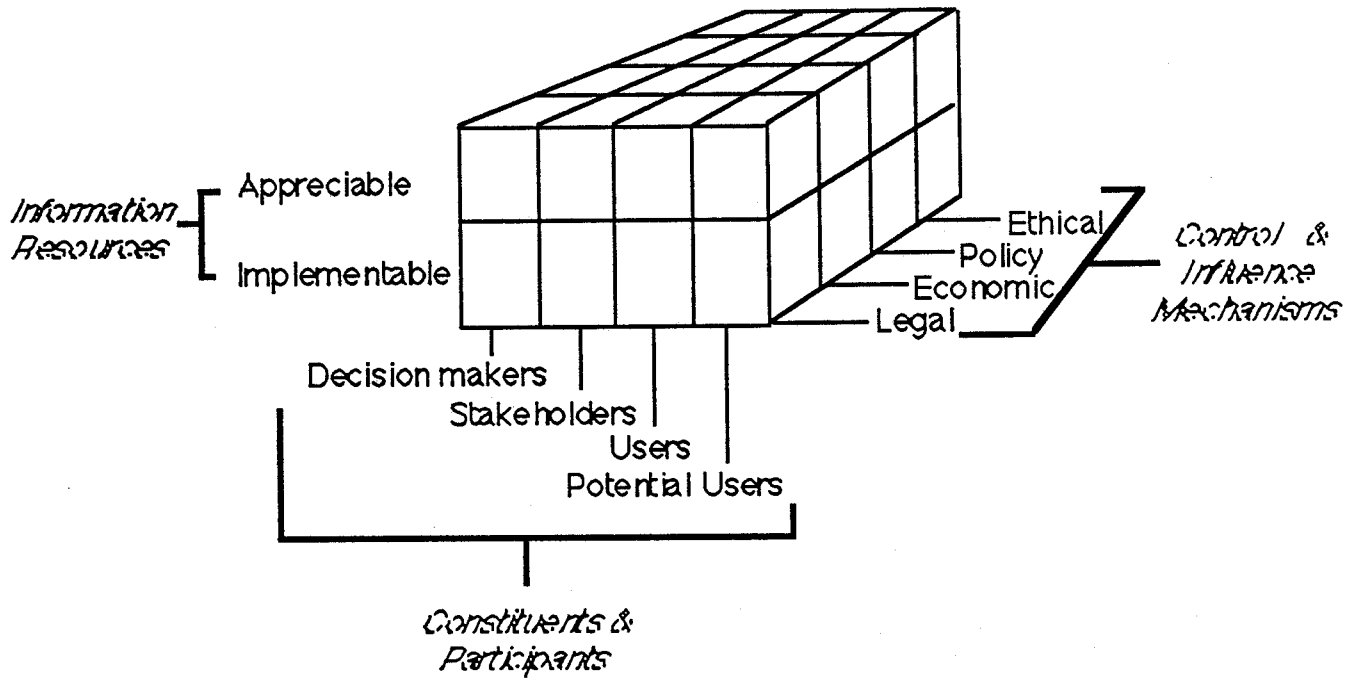
While the legal system and the market system are the apparent foundation of the present information infrastructure, there are other modes of control and other means for the distribution of knowledge. It is important to think about the diversity of means to develop and implement public policy in a free society, ranging from moral and ethical pressure to the governmental subsidiary of shared and cooperative resources (such as libraries).

¹⁴ *Ibid*, p. 22.

¹⁵ *Ibid*, p. 23.

III. CONCEPTUAL FRAMEWORK-The Electronic Citizen Model

A. The Model



IV. CONCEPTUAL FRAMEWORK AXIS 1: INFORMATION RESOURCES, FORMATS, AND TECHNOLOGY

A new taxonomy of information resources and tools (and communications) is needed. This taxonomy should enable more effective differentiation among domains of applicability of mechanisms for controlling and influencing the development and use of intellectual products. The taxonomy must fit well within the context of the "information revolution," especially with respect to the great proliferation of *new formats and new kinds of information and knowledge, and new media* which are being created through the use of digital technologies.

The thorough development of a taxonomy for digital productions will require discussion with a full range of stakeholders. (We are using "digital productions," an inadequate term, to describe in the broadest possible way, the entire collection of kinds of knowledge in use in digital environments.)

However, we offer here as a starting point a distinction of fundamental usefulness between "appreciable" and "implementable" (or "functional") digital products. *Appreciable intellectual products are those whose primary value lies in the "readers" direct experience of a representation of them.* Representations of appreciable intellectual products may be experienced, played, or performed. *Implementable intellectual products permit a user to perform some task or function, usually through additional tangible technology.* In the latter case, it is this task or function, rather than the intellectual product itself (or its representation) that is valued by the user. Note that the term "reader" seems appropriate to appreciable intellectual products, and the term "user" seems appropriate to implementable intellectual products.¹⁶

¹⁶ See Appendix for a more detailed description of this taxonomy.

A national superhighway ought to be more than just an extension to the existing electronic streets. Building it simply to provide more and faster resources for those who are already enabled may serve the vested interests of current stakeholders, but it is failing to exploit the potential NREN has for numerous *potential users* who are not able to articulate their views and needs regarding NREN to *decisionmakers*. This under-represented population includes public education, and other academic institutions that view their mission as teaching rather than as research-oriented; public libraries; and numerous social scientists whose models are as complex as hard science researchers, but whose expertise in the use of information technologies and awareness of their potential is lacking.

To effectively participate in the design and planning for NREN requires 1) knowledge of the operant decision system for NREN and 2) a means to participate in the decision making process.

At this time, participating in the decision making process means being able to communicate opinions to the *stakeholders*, who *de facto* have become the conduit to reaching the *decisionmakers*. If significant segments of the *potential* and *current users* of NREN are not accurately represented by *stakeholders*, decisionmakers may not address the needs of the potentially largest user group. In simplest terms, there are four sets of constituents and participants to be considered as we contemplate constructing the electronic highway: *decisionmakers, stakeholders, users, and potential users*.

B. Decisionmakers.

This category includes elected members of congress and their professional staffs, who have the authority and power to draw, enact and fund enabling legislation for NREN; and others in positions of power—corporate leaders, etc. Decisionmakers currently hold a preeminent position, as they control the allocation of initial resources needed to create the highway.

C. Stakeholders.

Stakeholders include representatives of various private, professional and public organizations who lobby for NREN and provide support and materials to the *decisionmakers*. In most instances, these individuals represent organizations with a vested interest in the creation of a national electronic highway. To many *stakeholders*, knowledge of the NREN and the digital infrastructure, intellectual property system, etc. is narrow and one-faceted—lawyers tend to view it as a mechanism for attaching property characteristics to intellectual labor; scientific researchers as a tool to develop and use sophisticated models; librarians as a means to access distant databases; publishers as a distribution channel. In truth, NREN is all of these simultaneously, and more.

D. Users.

This is the category for the widely dispersed collection of individuals who currently use electronic streets and would benefit from the creation of electronic highways to extend the resources available to them. This includes not only those who think of themselves only as being at the output end of the system, extracting materials to read, refine, and potentially incorporate in their future intellectual

accessible and usable widely. These organizations are characterized by the value-added services they provide. Examples include scholarly publishers such as *The New England Journal of Medicine*, which provide review and validation services to submitted works, thereby establishing a forum that is known and respected; libraries which provide archival, indexing, and access services; and publishers providing editing and refinement services to *creators/producers*, enhancing the work of content experts to create products that meet marketplace expectations.

Publishers/Distributors have the most obvious vested interest in the digital infrastructure, but surprisingly uneven levels of awareness of NREN's potential and impact, and inconsistent levels of representation and involvement among the stakeholders. The vested interest appears obvious— they are already investing time, energy and resources to bring intellectual products to market through currently available channels. Informal discussions with individuals included in the *publishers/distributors* category and a currently ongoing EDUCOM survey indicate that there are a significant number who do not accept the notion that electronic highways such as NREN will change the nature of their organizations, nor the services or products they create or distribute.

Although some software publishers and serial and book publishers are positioning to offer electronic distribution alternatives, others view their print-based traditions as sacrosanct and see no need to be concerned with electronic encroachments. If those who opt not to address the potential of NREN do so from ignorance, there is a need for education and enlightenment. If they refuse to acknowledge or accept change out of loyalty to paper media, the need is more difficult to address, but just as real.

- *Intellectual Products.* We will refer to the entire realm of the useful productions of the mind as "intellectual products." We use the term "products" to preserve a focus upon the useful objects produced by human intelligence, rather than the activity of thinking itself (which cannot be considered property in any sense). It is clear that some intellectual products are of great value, and must be regulated. However, not all valuable intellectual products should be regulated as property.

- *Intellectual Property Systems.* We distinguish intellectual products from intellectual property as between a class of objects and the social/legal/economic relations which define how those objects are used. That is, "intellectual property" is one important way to define the relationships between people and intellectual products, *but it is not the only important way that those relationships might be defined.*

- *Property Systems and Exchange Systems.* For example, in anthropological literature there is a distinction between "property systems" and "exchange systems." In property systems, intellectual products are treated most often as property, that is, as a kind of commodity or wealth. In exchange systems, intellectual products are often treated as *gifts*, that is, as a way of creating communal social relationships between people, or perhaps as a way of confirming or altering social prestige or status.¹⁹

2. *Implications of This Distinction*

There are four important implications of these two systems—property and exchange—for treating intellectual products and for contemporary policy.

- *Both Systems Exist.* First, both property and exchange systems exist in digital environments today, serving different needs.

- *Both Systems are Needed.* Secondly, these modes of relationship to intellectual products are not mutually exclusive; both are useful, and they are useful in concert with each other. Anthropological literature indicates that our notions of property have evolved as technology itself has evolved. The presence of more than one way of valuing intellectual products can contribute to an intellectually productive and socially useful dialogue which can help us evolve from an industrial society to an information society.

To put this point another way, our concept of intellectual "property" evolved in an industrial society, and must evolve further if our legal and economic system is to permit us to take full advantage and make the most productive, fulfilling, and cost-effective use of information technology.

¹⁹ NOTE: We include acts of sharing within our category of exchange systems, although we recognize the important distinction made by Harlan Cleveland between "exchanging" and "sharing" on page 45 of his article "The Global Commons: Information Technology and World Class Ideas," in *The Aspen Institute Quarterly*, Winter 1990, Vol. 2, No. 1. Also, see *The Gift*, by Lewis Hyde.

Eight of these nine definitions of the concept of property rights are focused on the relationship between an owner and the object. Only the last, the right to exclude others from using it, is focused upon the relationship between the object and social relationships between people. There is no discussion of the way products might be created, owned and used by a cooperative. In an exchange system, in contrast, the emphasis would be upon the use of the object as a means to demonstrate or create certain kinds of social relationships, a certain quality of society, or to redistribute social status or influence. In digital environments, for example, it is not unusual for cooperatives or consortia of users to contribute code to a shared resource (e.g., statistical analysis programs) or information to a shared database resource.

Clearly the intellectual *property* system is a necessary element of our economic system, *but our society consists of many institutions which are not wholly governed by the property system: the family; religious groups; and, more relevant to the problem at hand, educational institutions and libraries.*

Moreover, in the longer historical perspective, it is very likely that we will evolve new concepts of property rights with which to regulate digital intellectual products. By definition, information technologies shape communication, both the form and the content of communication, and communication is the essence of social relationships. Thus the regulation of intellectual products in the area of information technologies must consider both property rights and the quality of social relationships. We explicitly consider educational institutions and libraries as interested parties, but implicitly include other areas as well (e.g., family rights of access to information, the rights of voluntary and charitable institutions, the rights of foundations and research organizations, etc.).

While the economic value of information is fundamental in today's society, and will become even more important in the future, it is not the only important value in the creation and dissemination of ideas. Most obviously, there are educational and scientific values, and the public good itself which must be represented. These values are not just abstract concepts, but are integrated within the cultures and institutions of higher education, foundations and research communities, religious groups and others. Few members of these groups are yet effectively represented in policy debates about information technology.

Exemplifying an exchange based system for organizing intellectual products are the cooperative arrangements between colleges, universities, and computer manufacturers for organizing and distributing academic software, which is described in the next section. While each of the parties involved had interests, they were more complex than simple property interests; yet the outcome is a series of semi-formal institutions which while standing outside of the marketplace performed some of the functions which the marketplace was not able to perform autonomously.

B. Examples

In this section we shall use examples from education to illustrate exchange cultures in digital worlds.²¹

²¹ NOTE: It would be useful in many ways to develop a series of relevant case studies covering a wider range of environments and providing a deeper analysis in each instance than is offered below. That task is beyond the scope of this paper.

Presumably, social policy recognizes the connection between institutions based upon exchange systems—libraries and education—and technological innovation. This is not to say that the relatively recent problem of unauthorized copying of copyrighted materials such as microcomputer software is not a serious violation of property right; however, the real lessons of the photocopying crisis remind all concerned that social policy must balance between the two interests.

3. The EDUCOM Code: Extending an Academic Tradition?

a. Ways in Which Integration of the New Information Technologies IS an Extension of Academic Tradition

Recognizing that information technologies have often been used to abuse established copyrights, the EDUCOM Software Initiative (ESI) —now called the EDUCOM Educational Uses of Information Technology (EUIT) Program—has worked to extend to the new electronic environment the academic tradition of honoring intellectual achievement and respecting the rights of authors and publishers.

During the past few years, the ESI has worked closely with the Software Publishers Association and ADAPSO to increase awareness and understanding of copyright and related issues in higher education. We developed the EDUCOM Code, a broad statement of principle already widely disseminated in higher education and adopted by many colleges and universities. The Code first appeared in the brochure "Using Software—A Guide to the Ethical and Legal Use of Software for Members of the Academic Community," which was published jointly by EDUCOM and ADAPSO. More than 300,000 copies have been distributed throughout higher education.

The EDUCOM Code Software and Intellectual Rights

Respect for intellectual labor and creativity is vital to academic discourse and enterprise. This principle applies to works of all authors and publishers in all media. It encompasses respect for the right to acknowledgment, right to privacy, and right to determine the form, manner, and terms of publication and distribution.

Because electronic information is volatile and easily reproduced, respect for the work and personal expression of others is especially critical in computer environments. Violations of authorial integrity, including plagiarism, invasion of privacy, unauthorized access, and trade secret and copyright violations, may be grounds for sanctions against members of the academic community.

The Code is intended to help colleges and universities set the limits on the academic right to treat intellectual property as if it were part of a common exchange system. Enforcement is left to the development and dissemination of an ethical consensus

nothing for the research materials and support services provided, and owed the library nothing from the benefits he derived from his patents.

understanding by contributing one's ideas and thoughts to a collective process. Tenure, recognition and acceptance by peers, and personal satisfaction are critical motivating factors.

For example: Developments in fields such as genetics occur so rapidly that researchers exchange findings via NREN to avoid the delay of mail or journals. The graphics capabilities of the system will allow the inclusion of diagrams and three-dimensional images of the geneticists' work. Dance instructors will refine choreography scores using the same graphics capabilities. Music and speech therapy researchers will be able to ship both sound wave diagrams and sound bites to accompany their research, so that the actual sound reproduction will accompany their communications.

Classroom exercises and discussions can become interactive as students work with distant experts. Teachers can discuss and exchange lesson plans or classroom topics, thus allowing the isolated third-grade teacher on an Oklahoma Indian Reservation to interact with her counterpart in Oklahoma City, or New York. Similarly, the New York teachers could gain insights into life in the Indian Reservation for a class.

NREN users who see the network primarily as a means for accessing and retrieving information are usually functioning within a *property system*, wherein they exploit the value added resources available via NREN as purchasers rather than collaborative creators. These NREN users expect to have at their fingertips the current and complete data on a subject they are researching or studying. For example, social science or marketing researchers wanting the latest available data from the census to evaluate social trends or market potential would use NREN to access Michigan's ICPSR database which includes data derived from the U.S. Census. Public administration faculty and their students comparing "red lining" or rent subsidy programs of Arlington County, Virginia, versus Montgomery County, Maryland, might access American University's database of metropolitan Washington D.C.'s real estate transactions. A history teacher in Harrisburg, Pennsylvania, who wants her students to study the various patterns of response at federal, state and local levels to The Three Mile Island nuclear accident, might require them to use NREN to examine copies of the *Congressional Record* and similar documents at the state and local level.

For NREN users to access and use facilities such as databases, there is a need for some member or member organization to add value to the NREN resources by: designing and compiling the database, converting the raw data from the form in which it originally existed to one that can be used on the NREN, documenting the database and inquiry facilities, cataloging resources available, and keeping the database current once it has been made accessible via NREN. These value-added services can be provided under an *exchange* model, similar to a library, where users have free and open access to the information. Or, if the value-added provider decides that users should pay for the value added, as is currently most often the case, the process would follow the *property* paradigm.

NREN will function as a delivery system, allowing electronic citizens to select their roles in the system, and providing facilities that enable both the exchange and property paradigms to function simultaneously.

5. Higher Education, Noncommercial Software, New Technology, and the Publishing Industries

Annenberg/CPB Project has funded some of EDUCOM's activities, and is still considering the OCLC-EDUCOM cataloging project.

This new system of "publication" has not arisen from the print publishing sector, but almost entirely from cooperative arrangements among users, or by hardware and library service companies extending their interests to this new area. Thus, although print publishers have a major voice through the American Association of Publishers (AAP) in current litigation and lobbying about "intellectual property rights," they are not the only actors, or even very active participants in promoting the new emerging digital formats and forms of knowledge in the higher education sector of the market.

In other sectors of the marketplace the profiles are somewhat different. In secondary education, new companies such as SoftKat have arisen, providing both evaluation and distribution of carefully selected educational software. In industrial training, national print publishers have been active. In each of these other cases, buying is more centralized, and standards are more easily established within institutions than in higher education.

It is clear that print publishers are becoming more active, as with the announcement by McGraw-Hill that it is establishing a program of "custom publishing" in which faculty can edit electronic versions of copyrighted McGraw-Hill publications into customized textbooks which will be printed on demand. Addison-Wesley has conducted one of the more successful campaigns to sell software on disks in conjunction with textbooks.

Our point is not to criticize print publishers, who have substantial economic rights and interests to protect. Our point is that there are other actors, in effect cooperatives of users, who are creating new systems of evaluation and distribution for new kinds of knowledge based upon digital works, but who are yet little represented in litigation and national policy making for the intellectual property system.

3. Free Speech, Privacy and Due Process.

How will the rights to free speech and privacy of network communications and data be balanced with the need to ensure the security of the system (e.g., viruses), prevent illegal activities (e.g., fraud, theft), and regulate material which may be offensive to community or national standards (e.g., pornography, abusive communications, unwanted "junk mail," etc.)? Who will make these decisions? What kinds of due process rights will govern these sorts of issues? What kinds of rights, duties, and liabilities exist, if any, for end users?

C. Management and Content of the Delivery Systems—Especially NREN.

This section concerns policy issues about the management of the network, with special focus on policies that will affect the ability of educational institutions at all levels to access the network and its resources. Clearly there are other management issues beyond the scope of this paper.

1. Pricing Structures for Accessing the NREN and its Information Resources.

The pricing structures of the network can limit or extend the level of participation and the nature of its use. It is very important that pricing levels do not exclude certain classes of users from accessing the network itself; for example, public schools, libraries, and small businesses should not be excluded in favor of research universities and large corporations.

Can pricing and charging mechanisms provide adequate support for those who produce and distribute digital intellectual products? Will special categories of users—e.g., education, libraries—have favorable pricing options? I.e., how will "fair use" be extended to this environment?

2. Technologies and Skills

While the network must employ advanced technologies in order to fulfill its missions, the technologies required to access and use the network should not be beyond the economic resources of some classes of users. Nor should the underlying technology be changed too often in ways that make many users' equipment and work habits obsolete. While some network functions will require high quality workstations, it should be possible to use some of the network resources via relatively low cost terminals or microcomputers. Similarly, the user interface should not require sophisticated technical skills or training which might have the effect of limiting actual use of the network by those without access to special technical training. Individuals with disabilities should be able to use the network without extraordinary expense or inconvenience.

Will both the technical configuration and the legal and economic mechanisms permit all users to exercise the full extent of the power of the information technologies involved? Can technical and user support resources be made available at "reasonable" cost?

3. Who Will Decide What is Available on the NREN?

The network will provide access to many kinds of information resources, ranging from communications media to computing tools to databases and other kinds of information. Who will decide the resources to be placed on the network, the pricing of these resources, and access rights to them? Will the network enable more

if this is not the case the issue of collaborative work and group rights to intellectual products is a matter that requires deliberation.

1. Collaborative Work

What kinds of software will be developed to encourage and support collaborative work? Will collaborative groups have special rights, and how will they be governed? How will intellectual property rights be shared among collaborative workers: is this a matter for regulation by participants alone, or should there be network policy? How will the attribution of authorial credit and authentication of "official" versions of documents work?

How will peer review function in this environment?

2. International Collaborative Work

Will network access be extended to foreign users? Specifically, since scientific and technological research often is conducted by multinational teams, will collaborative work support multinational teams? Will multinational teams have access to all network information resources? Will international competition be diminished, enhanced, or distorted? How will issues of national security be addressed?

includes recognition that no major legislation or new economic patterns or new codes of ethical behavior in this arena can be effectively developed without education playing an active, perhaps a central, role.

2. *Long Term*

By the end of this century we *expect* we will have a new set of laws covering the control of and access to information. We *expect* we will have some new kinds of companies, perhaps some entirely new industries focused on the aggregation, organization, distribution, and development of ideas and information within a rich and varied electronic environment. We *expect* many of these new companies will work closely with educational institutions, in an atmosphere of mutual understanding and respect. We *expect* many of these educational institutions will bear little resemblance to most of those we know well now: while there will continue to be good reason for providing the special experience of residential colleges and universities for some purposes, and good reason for providing the direct stimulation of the classroom for some purposes, much of the formal learning will be conducted in greater part electronically.

We *hope* we will achieve these conditions much earlier than the year 2,000. But, finally, we *hope* all of these changes will have occurred within a growing commitment to ensure that information technology, and the unavoidable necessity to revise our concepts and practices for treating "intellectual property," must be used to serve an educational system that is ever more effective at meeting the learning and information needs of all the people. Resolving the interrelationships among information technology, intellectual property, and education can form the foundation for achieving social goals that are presently falling farther from our grasp: a better-educated and better-informed populace is still an essential and achievable vehicle for realizing the economic and social potential of a democratic society.

contributions in return. We need to confirm that ideas and the works of others must be treated with respect. Respect cannot be legislated, but it can be taught.

Within academia, we need to develop new conventions for the attribution of credit in environments where collaboration is becoming more organic, complex, and desirable. We need guidelines for the use of online information of all sorts, including a statement of "rights and responsibilities of users"—a Bill of Rights for Electronic Citizens. And we need procedures for defining and identifying abuses, and proposing punishments consistent with the academic culture.

Conversely, we need to provide guidelines within education for those who are actively contributing to this rapidly expanding corpus of electronically accessible information. We need to use the strengths of schools, colleges, and universities to *educate* users of the new technology, and to *educate* those who develop and maintain it about the moral, ethical, and legal constraints on their behavior. Educational institutions, especially, must be sensitive to the boundaries between individual responsibility and institutional liability.

3. Representation for All Constituencies

We need effective representation for creator/producers and users of information.

Current publishers and distributors of information are relatively well-represented by organizations with an economic interest in information products, such as the AAP, SPA, *et al.*, but the creators and producers of information — especially those working primarily within the new media and not affiliated with commercial publishers — do not have similarly powerful and effective organizations. Perhaps more important, the users of information have no representation as such.

The risk is that in this rapidly changing technological environment the better-represented interests of the more traditional publishers and distributors, and of industries such as entertainment and telecommunications, may influence the development of new economic and legal patterns in ways that inadvertently conflict with the best long-term interests of the creator/producers and of the users — especially in educational institutions.

4. Forum for the Voice of Education

We need a forum in which the voice of education will be strong and well-heard. The potential needs and contribution of educational institutions, and of the individuals within them, must be heard by the other sectors with significant interests in the future course of interaction between the capabilities of information technology and our society's treatment of intellectual property. In turn, those within education need to understand the perspective, needs, and resources of the other sectors. The recent and ongoing effort to create a National Research and Education Network (NREN) is one model for such an effective forum and collaboration. However, the full constellation of issues related to the combined interests of education, information technology, and intellectual property is even more complex, and cannot be quickly focused on a single tangible outcome such as the NREN.

We need a forum in which to bring together representatives of the interested parties to discover much more clearly how those interests may conflict or align. Such a forum might initially provide a way to represent the interests of education in the development

APPENDIX

I. TAXONOMY OF INTELLECTUAL WORKS

A. Introduction

What follows is an extension of the taxonomy introduced in section IV above. While still incomplete, the greater detail and the inclusion of examples below more clearly suggest the direction that needs to be further developed.

C. Description

1. "Implementable" Intellectual Products

"Implementable" intellectual products are those that permit the possessor of a representation of them to perform some task or function, usually through additional *tangible* technology. It is this task or function, rather than the intellectual product itself, or its representation, that is valued by the user. Note that the term "user" seems appropriate for those who acquire and make use of this kind of intellectual product.

Consumable Representations of Intellectual Products. "Consumable" representations of intellectual products are those that cannot be used or experienced more than once.²⁷

Example: Over the counter drugs; e.g., Nuprin

Example: Live performance of improvisational jazz

Example: Perfume

Example: Daily newspaper

Example: Radio newscast

Example: Weather report

Example: Stock price report

Example: *Haute couture* clothing

Example: Sky writing

Directly Implementable Representations of Intellectual Products. "Directly implementable" representations of intellectual products are those that, immediately upon acquisition, permit the possessor to perform some task or function. These representations require only minimal knowledge and skill from the user to modify or prepare the related tangible technology, if any is necessary.

Example: telephone book (directory)

Example: McDonald's cash register

Example: user friendly utility computer programs

NOTE: "User friendly" is a term extremely dependent on the context — including both the background and skill of the user and any ancillary materials that may be available.

Example: shovel? prefab kit for building a tool shed

Example: directions for cooking a tv dinner

Example: penicillin

Example: automatic pilot programs

Indirectly Implementable Representations of Intellectual Products. "Indirectly implementable" representations of intellectual products are those that (a) require the user to have more than minimal knowledge, experience, or skill in using this form of representation with the necessary tangible technology; and/or (b) apply more than casual attention and take more than a minute or two to modify or prepare the necessary tangible technology.

Example: printed listing of a computer program

²⁷ Note: This category may not belong in 'intellectual products' at all!