Cross-Industry Working Team
An open, international, vendor-neutral forum for the exchange of ideas and information among those who are responsible for the management of digital assets and information in the public and private sectors.
PRESERVING ACCESS TO DIGITAL INFORMATION

Table of Contents

1.0 Introduction
2.0 Digital Objects
3.0 Key Infrastructure Requirements
4.0 Critical Barriers Opportunities
5.0 Access to Digital Objects
6.0 Reflections on Digital Management Methodologies
Bibliography
Appendix A
Appendix B

1.0 Introduction

The development and widespread use of global information networks, and the rapid growth of electronic publishing, presents enormous challenges and opportunities for those responsible for the management of information in the public and private sectors. Information in digital form can be created, disseminated, and used in ways that are fundamentally different from information in analog form. Information in digital form can be easily disseminated and used by many people at the same time, and it can be easily copied, modified, and combined with other information. These qualities have created a new paradigm for the creation and dissemination of information, and have created a new set of challenges for those who are responsible for the management of information.

In the past, there was a relative shortage of creative work. A creative work was valuable because it was difficult to produce and disseminate. Copyright was a useful tool for encouraging the creation and dissemination of creative works by providing economic incentives and protecting the interests of those who invested in the creation and dissemination of creative works. Copyright was a useful tool because it was difficult to copy and disseminate creative works, and because it was difficult to combine creative works with other creative works to produce new creative works.

Although the Internet "disrupted digital order" (digital policies) by creating a "digital free-for-all" (Lynch, 1994), it also created the potential for the development of new information management tools and techniques. For example, it is difficult to make a perfect copy of a work that is in analog form, but it is easy to make a perfect copy of a work that is in digital form. It is difficult to distribute an analog work to many people at the same time, but it is easy to distribute a digital work to many people at the same time. It is difficult to combine analog works with other analog works to produce new works, but it is easy to combine digital works with other digital works to produce new works. These qualities have created the technological incentive for the intellectual property incentive.

Intellectual property laws have attempted to address the use of digital information by extending the existing paradigm governing the creation and dissemination of information. For example, the Internet is a "conduit" for information, just as the postal service is a conduit for information. Therefore, the Internet should be treated like the postal service. The Internet is a place where information is "published" and "disseminated", just like a newspaper. Therefore, the Internet should be treated like a newspaper. Copying an article in a newspaper is a violation of the law, and copying an article on the Internet should be treated in the same way. Although these analogies have created a framework for the application of existing laws to the new environment, they have also created confusion and controversy because they have not addressed the fundamental issues that are created by the new technology.

Emerging technical capabilities - especially efforts to develop "trusted systems" and to develop "rights management" systems - may provide the technological means to address the issues that have created the need for a "conduit" or "place" analogy. It is important that we begin to understand the strengths and weaknesses of these technologies, and that we begin to develop a framework for the management of information in digital form. This paper addresses various issues concerning the management of information in digital form, and it proposes a framework for the management of information in digital form. This paper also identifies a number of critical barriers to the management of information in digital form, and it proposes a number of enabling mechanisms (opportunities) and planning strategies for overcoming these barriers.

This paper is intended to be a "discussion document" that will be used to stimulate discussion among those who are responsible for the management of information in the public and private sectors. It is also intended to be a "framework" document that will be used to "organize" the discussion of the issues that are addressed in this document. This document does not attempt to address all of the issues that are relevant to the management of information in digital form. It does attempt to address some of the issues, and it does attempt to provide a framework for the discussion of the issues that are addressed in this document.

1.1 Intellectual Property

Intellectual property is a term that is used to describe a "bundle" of rights that are associated with certain types of information. For example, the term "intellectual property" is used to describe the rights that are associated with "creative works" such as books, movies, and computer software. The term "intellectual property" is also used to describe the rights that are associated with "business identifiers" such as trademarks and service marks. The term "intellectual property" is also used to describe the rights that are associated with "inventions" such as machines and processes. The term "intellectual property" is also used to describe the rights that are associated with "business processes" such as the use of a computer network to process a financial transaction. Finally, the term "intellectual property" is also used to describe the rights that are associated with "information" such as the information that is contained in a database.

Intellectual property laws have attempted to extend the existing paradigm governing the creation and dissemination of information to the digital environment. For example, copyright laws have attempted to extend the existing paradigm by providing the owner of a copyrighted work with the exclusive right to make copies of the work, to make derivative works, to distribute copies of the work, to perform the work in public, and to display the work in public. These laws have also attempted to extend the existing paradigm by providing certain exceptions to the exclusive rights of the copyright owner, such as the "fair use" exception, the "library" exception, and the "first sale" exception. These laws have also attempted to extend the existing paradigm by providing certain exceptions to the liability of certain "conduits" for the infringement of copyrighted works, such as the exception for "telecommunications carriers" and the exception for "online service providers".

1.2 Scope Issues for Further Exploration

In the discussions of the management of information in digital form, there are many issues that need to be addressed. For example, there are technical issues, economic issues, legal issues, and social issues. This paper will address some of the issues in each of these areas.

1.2.1 Incentive Issues

Intellectual property laws have attempted to create economic incentives for the creation and dissemination of information. For example, copyright laws have attempted to create economic incentives for the creation of "creative works" - specifically, art and literature. The "fair use" exception to the exclusive rights of the copyright owner has created an economic incentive for the creation of "derivative works" - specifically, works that are based on other works. The "library" exception has created an economic incentive for libraries to make copies of copyrighted works for their patrons. The "first sale" exception has created an economic incentive for the "secondary market" for used books. The "telecommunications carrier" exception has created an economic incentive for telecommunications carriers to provide "conduit" services. The "online service provider" exception has created an economic incentive for online service providers to provide "conduit" services.

- Will network users be able to license information from information providers on a "pay-per-use" basis?
- Will network users be able to license information from information providers on a "subscription" basis?
- Will information users be able to "bundle" or otherwise "package" information for resale to other users?
- Will actions such as the "fair use" exception, the "library" exception, and the "first sale" exception have any "economic" effect on the "digital" environment?
- What economic incentives will be required to encourage the creation of "derivative works" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "creative works" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "conduits" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "digital libraries" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "digital archives" in the "digital" environment?
- Will the "fair use" exception, the "library" exception, the "first sale" exception, and the "conduit" exceptions have any "economic" effect on the "digital" environment?
- Will "rights management" systems have any "economic" effect on the "digital" environment?
- Will "trusted systems" have any "economic" effect on the "digital" environment?
- Will "digital libraries" have any "economic" effect on the "digital" environment?
- Will "digital archives" have any "economic" effect on the "digital" environment?
- How should "derivative works" be treated from a "economic" perspective in the "digital" environment?
- How should "creative works" be treated from a "economic" perspective in the "digital" environment?
- How should "conduits" be treated from a "economic" perspective in the "digital" environment?
- How should "digital libraries" be treated from a "economic" perspective in the "digital" environment?
- How should "digital archives" be treated from a "economic" perspective in the "digital" environment?
- Should a "digital library" be treated like a "collection" of "digital information"?
- Should a "digital archive" be treated like a "collection" of "digital information"?
- Should a "digital library" be treated like a "place" or "place" analogy?
- Should a "digital archive" be treated like a "place" or "place" analogy?
- What economic incentives will be required to encourage the creation of "digital libraries" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "digital archives" in the "digital" environment?
- What economic incentives will be required to encourage the creation of "digital information

A single, rigid, homogenous piece of hardware, or controlling the entire computer system, or a single, rigid, homogenous piece of software, or all on a computer. Thus, if a single component fails, the entire system fails. Instead, it is preferable to have many pieces of hardware, or "slots" which hold "blades" (all-in-one computer boards, each containing processor, memory and I/O), and many pieces of software, so that if one component fails, only a portion of the system fails, and the rest of the system can continue to function, or can be quickly restarted.

A rule-based, environment such as the Internet, assumes that everything is untrustworthy, and that everything must be "proven" to be safe, or "trusted." Thus, it is preferable to have a system that is "untrustworthy" by default, and to allow the operator of a single, or a limited number, of trusted computers to "prove" that the system is trustworthy, and to "distribute" trust to other computers, and to "revoke" trust from any computer that is found to be untrustworthy.

6.2 Protected Containers

A protected container approach, on the other hand, emphasizes an intrinsically secure environment, and assumes that everything is trustworthy by default, and that everything must be "proven" to be unsafe, or "untrusted." Thus, it is preferable to have a system that is "trustworthy" by default, and to allow the operator of a single, or a limited number, of untrusted computers to "prove" that the system is untrustworthy, and to "distribute" untrust to other computers, and to "revoke" untrust from any computer that is found to be trustworthy.

A rule-based approach for providing protection is based on the assumption that everything is untrustworthy, and that everything must be "proven" to be trustworthy. Thus, the "trusted" computer, or "trusted" software, must be "proven" to be trustworthy, and "untrusted" computers, or "untrusted" software, must be "proven" to be untrustworthy. Thus, the "trusted" computer, or "trusted" software, must be "proven" to be "trustworthy," and "untrusted" computers, or "untrusted" software, must be "proven" to be untrustworthy."