COPYRIGHT INFRINGEMENT ON THE INTERNET--AN INTERNATIONAL PROBLEM

A Senior Honors Thesis

Presented in Partial Fulfillment of the Requirements for the Degree B.S.B.A. with Distinction in Management Information Systems at the Max M. Fisher College of Business of The Ohio State University

By

Sanjiv G. Patel

The Ohio State University
June 1996

Project Advisor: Professor Varghese Jacob, Department of Accounting and MIS

Examination Committee:

Professor Varghese Jacob
Professor Elliot Klayman
Professor Richard Murdock
Copyright by
Sanjiv G. Patel
1996
ACKNOWLEDGMENTS

I express sincere appreciation to my advisor, Professor Varghese Jacob, for his patience, constructive criticism, and encouragement throughout the research. I also wish to thank the members of the examination committee for the insights, suggestions and comments they provided. Finally, special thanks goes to Cathy Ryan for taking the time to proofread and make suggestions for this thesis.
ABSTRACT

An analysis of current U.S. copyright laws and international intellectual property agreements (i.e., the Berne Convention, the GATT, the NAFTA, and the Rome Convention) reveals their limitations in preventing copyright abuses on the Internet. This analysis shows a need for respective governmental bodies to update legislation concerning copyright abuses on bulletin board services, newsgroups, the World Wide Web, and e-mail. Consequently, amendments to these international agreements are proposed. In addition, a technological solution is proposed that places the responsibility of copyright protection on Internet publishers. This solution also addresses these publishers’ needs for various levels of confidentiality.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapters:</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>iii</td>
</tr>
<tr>
<td>Abstract</td>
<td>iv</td>
</tr>
<tr>
<td>List of Figures</td>
<td>vii</td>
</tr>
<tr>
<td>1. Introduction</td>
<td></td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Types of Works Eligible for Copyright Protection in the U.S.</td>
<td>2</td>
</tr>
<tr>
<td>1.3 Copyright Eligibility Requirements</td>
<td>3</td>
</tr>
<tr>
<td>1.4 Eight Categories that Need to be Protected</td>
<td>4</td>
</tr>
<tr>
<td>1.5 Compilations and Derivative Works</td>
<td>6</td>
</tr>
<tr>
<td>1.6 Fair Use</td>
<td>7</td>
</tr>
<tr>
<td>2. Copyright Problems on the Internet</td>
<td></td>
</tr>
<tr>
<td>2.1 Introduction: What is the Internet?</td>
<td>8</td>
</tr>
<tr>
<td>2.2 Why is it So Easy for Copyright Infringement to Occur on the Internet?</td>
<td>9</td>
</tr>
<tr>
<td>2.3 What Copyright Abuses are Occurring on the Internet?</td>
<td>9</td>
</tr>
<tr>
<td>2.3.1 Liability Issues concerning Bulletin Board Service Providers</td>
<td>11</td>
</tr>
<tr>
<td>2.3.2 Problems with the World Wide Web</td>
<td>13</td>
</tr>
<tr>
<td>2.3.3 Problems with Electronic Mail</td>
<td>14</td>
</tr>
<tr>
<td>3. Problems with Copyright Enforcement</td>
<td></td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>17</td>
</tr>
<tr>
<td>3.2 Current Laws</td>
<td>17</td>
</tr>
<tr>
<td>3.3 Problems within the U.S. Concerning the Lehman Report</td>
<td>18</td>
</tr>
<tr>
<td>3.4 International Environments</td>
<td>20</td>
</tr>
<tr>
<td>3.4.1 Different Connotations of the Copyright</td>
<td>22</td>
</tr>
<tr>
<td>3.4.2 Problems with Current International Treaties</td>
<td></td>
</tr>
<tr>
<td>3.4.2.1 The Berne Convention</td>
<td>23</td>
</tr>
<tr>
<td>3.4.2.2 GATT and the Uruguay Round</td>
<td>25</td>
</tr>
</tbody>
</table>
4. Proposed Solutions
   4.1 Introduction................................................. 32
   4.2 Proposed Amendments to Domestic Laws.................. 32
   4.3 Proposed Amendments to International Treaties......... 34
   4.4 Current Possible Technological Solutions.............. 36
      4.4.1 Proposed Improvements to the Technological Solutions
            Currently Available or Under Development
         4.4.1.1 Introduction........................................ 38
         4.4.1.2 Recognition of Varying Degrees of Copyright
            Protection.................................................. 39
         4.4.1.3 Technological Solution Using the Emerging
            Network-Centric Environment............................ 40
   4.5 Educating the Public........................................ 42

5. Conclusion....................................................... 43

6. Endnotes........................................................ 44

7. List of References............................................... 47
# LIST OF FIGURES

<table>
<thead>
<tr>
<th></th>
<th>Protection of Intellectual Property Related to the Internet in the Trips Accord</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>27</td>
</tr>
</tbody>
</table>
CHAPTER 1

1.1 INTRODUCTION

The emergence of the Internet has opened many new possibilities for individuals and organizations to exhibit their electronic creations to the rest of the world. However, the protection of intellectual property remains a significant problem to those with the courage to publish on the Internet. Unfortunately, without adequate enforcement of intellectual property rights in Cyberspace, many people are discouraged from displaying their work on this medium.

The protection of intellectual property has always been problematic for inventors and authors within domestic and international boundaries. Legislation has traditionally been a few steps behind in establishing domestic guidelines to protect intellectual property in new types of media. However, protecting intellectual property on an international level is a more significant problem because one nation does not have the power to enforce protection of intellectual property in another nation. Although various international treaties do demand the protection of intellectual property, often this method of enforcement is ineffectual because local governments tend to favor helping their local economies.

The Internet complicates the problem of enforcing intellectual property rights in international environments. The nature of the Internet makes it very difficult to track those who steal works from those who have published on it. Because access to
information on the Internet is available anywhere in the world, anyone can copy intellectual property without worrying about getting caught by the authorities. Steps must be taken to protect works on the Internet, or publishers may lose millions, even billions, of dollars to illegal copying of intellectual property.

This paper defines copyright infringement on the Internet, and possible solutions to reduce this global problem. It begins with a general definition of what types of works are eligible for copyright protection. It then assesses the current copyright problems on the Internet, followed by an analysis of the deficiencies in domestic and international copyright laws as applied to this electronic medium. Finally, it offers possible ways to counter these problems, ranging from technological solutions to amendments of copyright laws.

1.2 Types of Work Eligible for Copyright Protection in the U.S.

The protection of intellectual property is defined in Article 1, Section 8, Clause 8 of the United States Constitution as follows: “[T]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” Copyright protection extends only to the expression of the ideas, facts, and procedures in an article, not the ideas, facts and procedures themselves, no matter how creative or original they may be. Protection does not extend to any “idea, procedure, process, system, method of operation, concept, principle, or discovery regardless of the form in which it is described, explained, illustrated, or embodied” in such work. Also, ownership, possession, or any other
attachment to or relationship with a copy of a copyrighted piece does not entitle one to exercise any of the exclusive rights of the copyright owner. Areas covered include access to a copyrighted piece through a computer network, reproduction, and distribution.

Section 102 of The Copyright Act of 1976, as amended in 1994, defines and categorizes intellectual property (Section 1.4 provides details) to protect it from illegal duplication. In addition, the Lehman Report was released in 1995 as a proposed amendment to the current copyright act to provide copyright protection for works published on the Internet.

However, copyright protection is not extended under the Copyright Act of 1976 to works of the U.S. Government. Thus, a U.S. governmental work may be reproduced and distributed without infringement liability under current U.S. copyright laws.

1.3 Copyright Eligibility Requirements

The courts have established three basic requirements for copyright protection: originality, creativity, and fixation. To be original, a work merely must be one of independent creation (i.e., not copied from another source). While there must also be a modicum of creativity in the work, the level of creativity required is exceedingly low; "even a slight amount will suffice."3 The final requirement of fixation is the most important one pertaining to works on the Internet. Protection attaches automatically to an eligible work of authorship the moment the work is sufficiently fixed to a tangible medium of expression. This medium of expression may currently exist, or can be developed in the future.
A transmission is not a fixation. Therefore, works transmitted “live” via the Internet will not meet the fixation requirement, and will be unprotected by the Copyright Act unless the work is being fixed at the same time as it is being transmitted. For instance, if someone uses an Internet browser to view images from a home page or other bulletin board service and the work is purely transient in nature, “such as those projected briefly on a screen, shown electronically on a television or cathode ray tube, or captured momentarily in the ‘memory’ of a computer,” then those works are not sufficiently fixed.

However, a simultaneous fixation during a transmission is subject to copyright protection laws. Thus, if a browser on the Internet allows a user to put a permanent copy of a work on storage devices such as magnetic and optical disks, then the copy is under copyright protection.

1.4 Eight Categories of Works that Need to be Protected

Many different types of works on the Internet need to be protected, and the most common types can be categorized into eight different categories. Different types of media are due different types of protection under current copyright law. These categories are not all inclusive because some forms of work, such as multimedia presentations, can be put in more than one category. A detailed definition of each is given in Section 101 of the Copyright Act of 1976 as follows:

1. **Literary**
The majority of works available on the Internet are literary works. They are works expressed in words, numbers, or other verbal or numerical symbols, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, films, tapes, disks, or cards, in which they are embodied. Literary
works also include computer programs (the 1976 Copyright Act and the 1980 Computer Software Amendments define a "computer program" as a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result\(^6\), articles, directories, computer databases, essays, catalogs, poetry, dictionaries, encyclopedias, and other reference materials.

2. **Musical works**  
A musical work consists of the musical notes and lyrics, if any, in a musical composition. A musical work may be embodied in any form, such as a piece of sheet music or a compact disc. Musical works may be "dramatic," i.e., written as part of a musical or other dramatic work, or "nondramatic," i.e., an individual, free-standing composition.

3. **Dramatic works**  
A dramatic work is one in which a series of events is presented to the audience by characters through dialogue and action as the events happen, such as in a play.

4. **Pantomimes and choreographic works**  
Pantomimes (expressions by mute gestures) and choreographic works, such as dances, can be fixed in a series of drawings or notations, but are usually fixed on film or videotape.

5. **Pictorial, graphic, and sculptural works**  
A significant portion of the works traveling through via the Internet will be pictorial and graphic works. They include two-dimensional and three-dimensional works of fine, graphic, and applied art, photographs, prints and art reproductions, maps, globes, charts, diagrams, models, and technical drawings, including architectural plans.

6. **Motion pictures and other audiovisual works**  
Audiovisual works consist of a series of related images which are intrinsically intended to be shown by the use of machines, or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied. Motion pictures are audiovisual works consisting of a series of related images which, when shown in succession, impart an impression of motion, together with accompanying sounds, if any.

7. **Architectural works**  
An architectural work is the design of a building, as embodied in any tangible medium of expression, including a building, architectural plans, or drawings. It includes the overall form as well as the arrangement and composition of spaces and elements in the design of the building.
8. **Sound recordings**

Sound recordings encompass every sound pattern recorded on digital media, whether or not it is musical in orientation.

1.5 **Compilations and Derivative works**

Many works published on the Internet do not fit into one of the aforementioned eight categories protected by copyright laws. Multimedia works are a prime example. Generally, multimedia works include two or more of the following preexisting elements: text (literary works), computer programs (literary works), music (sound recordings), still images (pictorial and graphic works), and moving images (audiovisual works). These publications are considered compilations and derivative works. Derivative works consist of "editorial revisions, annotations, elaborations, or other modifications which, as a whole, represent an original work of authorship." Compilations are works "formed by the collection and assembling of preexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship." 

Section 103(b) of the 1976 Copyright Act defines copyright laws dealing with compilations and derivative works such as multimedia publications:

The copyright in a compilation or derivative work extends only to the material contributed by the author of such work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material. The copyright in such work is independent of, and does not affect or enlarge the scope, duration, ownership, or subsistence of, any copyright protection in the preexisting material.
1.6 Fair Use

Many Internet users may claim "fair use" in reproducing copyrighted works that they find on-line. However, Section 107 of the 1976 Copyright Act only allows reproductions of copyrighted works "for purposes of criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research." Numerous factors exist that determine whether or not the fair use doctrine is applicable to a particular case of reproduction. These include:

1. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
2. the nature of the copyrighted work;
3. the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
4. the effect of the use upon the potential market for or value of the copyrighted work.
CHAPTER 2. COPYRIGHT PROBLEMS ON THE INTERNET

2.1 INTRODUCTION: WHAT IS THE INTERNET?

The Internet is the first generation of a public information superhighway network. The Internet began “as a method for controlling communication in the event of a nuclear war. Developed and entirely funded by the United States government, it began as a [decentralized] mechanical system which could maintain communication throughout a nuclear holocaust.”10 It then evolved to provide its users (predominantly university students and professors) with access to free flowing information in a non-commercial environment. According to Professor Dan L. Burk of George Mason University, the Internet is:

[A] river, highway, or circulatory system: local networks funnel information traffic into larger regional networks, which in turn are connected to high capacity “backbone” linkages. This network of computers, its electronic traffic enabled and directed by host computers at each interconnected site, links literally millions of users in dozens of countries all over the world.11

The Internet allows parties to exchange intellectual information (i.e., electronically coded text, data, pictures, music, and software) at an extremely high speed. With the advent of the World Wide Web and electronic mail (e-mail), Internet usage has grown exponentially and has allowed it to become commercial in nature. Starting in May of 1995, the Electronic Messaging Association has estimated about one billion e-mail messages are sent every month, which is up from 230 million three years ago.12
2.2 Why is it So Easy for Copyright Infringement to Occur on the Internet?

The nature of the Internet allows works to be put on it in digital form. Digital forms do not suffer from degradation as do analog reproductions. Each reproduction of an analog work looks or sounds worse, while each reproduction of a digital work has exactly the same quality as the original piece.

It is also very simple for a party to make copies of software, digitized images, text, and music because most software for using the Internet has built-in features allowing files to be freely copied with a single command or mouse click (i.e., World Wide Web browsers, such as Netscape Navigator): “The electronic archives on the Internet allow thousands of individuals to access information at a marginal cost close to zero.” Even e-mail makes it easy to duplicate a copyrighted work because most packages allow users to “reply” to or “forward” messages that include a copy of the original sender’s message.

No matter which Internet software package parties use, the financial burden of paying for photocopying a work--or parts of it-- becomes nonexistent as a barrier to prevent copyright infringement. Thus, the combination of excellent reproduction quality and extreme ease of copying make copyright infringement very easy.

2.3 What Copyright Abuses are Occurring on the Internet?

Many types of copyright abuse occur on the Internet. These abuses happen on bulletin board services, newsgroups, the World Wide Web, and e-mail. The major problem is that when a piece is copied from the Internet to a permanent medium such as floppy or hard disk, there is no payment made to the original creator of the work unless he
or she instills password protection for accounts (or other forms of defense). This lack of revenue could deter producers of works from developing and posting their pieces where there is no return on their investments. A related problem exists when parties illegally duplicate copyrighted material off the Internet and sell it to others without giving back any revenue to the original copyright owner. Burk concludes, "[W]here everything is free, little will be offered."\(^{14}\)

Another problem with the Internet is that it is a collection of digital information processors from around the world. The remote logon (i.e., file-transfer-protocol) and telnet features of the Internet allow users in one geographic location to access and copy materials in other geographic locations very far away. A conflict arises because the Internet allows an author in one jurisdiction to create a work in another jurisdiction.

For instance, a user in New York City could log onto a server located in Germany via the telnet feature of the Internet if he or she has access rights. Then the user could create a work in Germany without leaving New York City. Because the work is actually fixed on the server in Germany, the copyright requirement of fixation in the U.S. is not applicable. Thus, one could argue that the work is not enforceable by U.S. copyright laws. The assumption in some laws that the author and his/her work be present at the same location is no longer valid, which leaves the status of such a work uncertain.\(^{15}\) Hence, many parties take advantage of this unresolved issue to circumvent the legal authorities in their jurisdiction.

Oftentimes, parties can illegally manipulate a copyrighted work on the Internet, such as an image. Because these works are digital, it is very easy to alter published
material with the use of other graphically oriented software. Consequently, a problem of authentication occurs which may be summed up by the question, “How much of a copyrighted work is used in another author’s work to call it a copyright infringement?” This problem enlarges on the Internet due to its inherent ability to allow users to download, copy, manipulate, and redistribute the copyrighted works without economic loss to the infringers.

Sometimes parties do not violate copyrights intentionally. For instance, many businesses have connected their computer networks to the Internet. Employees now have access to files of images and other software from all around the world. If an employee working in a business finds a copyrighted article in a newsgroup on the Internet and decides to print it out to distribute to coworkers without authorization from the original author of the work, this action would be a violation of the copyright law. In fact, businesses become potentially liable for these actions of their employees.

2.3.1 Liability Issues Concerning Bulletin Board Service Providers

Bulletin board service providers on the Internet face legal challenges from their users when copyright infringement occurs on the service providers’ servers. Service providers fear that exposure to liability may make it too costly to do business. They argue that liability should only be imposed on those providers that accept the responsibility to post works over their on-line services. The problem is that most on-line bulletin board service providers will not assume responsibility for their subscribers’ illegal actions.
However, it is virtually impossible to monitor the large volume of material transmitted over on-line services without hurting communication capabilities.

Several recent cases have sent a message to service providers to take better precautions about what materials they allow their subscribers to post on their systems. In *Sega Enterprises v. MAPHIA*, the court held that the bulletin board service provider could be held directly liable, and liable as a contributory infringer, for making and distributing copies of a copyrighted work. The service provider was found liable because it had knowledge that its subscriber was illegally providing copyrighted Sega video games for anyone to download from the on-line system. In this case, the service provider did not attempt to take action to remove the copyrighted material from its on-line service. Thus, the court found it liable, as well as the individual subscriber.

In *Playboy Enterprises Inc. v. Frena* the court ruled that the on-line service provider (Frena) was liable for its subscriber posting pictures from Playboy magazine on the on-line system. In this case, the court found the bulletin board service provider contributorily and vicariously—as opposed to directly—liable because it had no idea that Frena was illegally posting copyrighted material on the service provider’s on-line system. Because the on-line service provider was not found directly liable in this case, it did not have to pay all of the damages that Playboy Enterprises, Inc. accrued from this infringement. Thus, the courts have found that it makes a difference whether the on-line service provider has prior knowledge of what is being posted on its system.

Unfortunately, neither of the previous cases set a precedent on whether on-line service providers should be liable for the actions of its subscribers. On-line service
providers could try to circumvent the law by claiming that they have no idea what materials their subscribers are uploading to their systems. Hence, it is currently being debated whether all on-line service providers should be held directly liable for their subscribers' actions notwithstanding knowledge of illegal material being posted on their system. The rationale for this opinion is that on-line service providers would be forced to help find new ways (such as developing new technology) of preventing their subscribers from illegally posting copyrighted works.

### 2.3.2 Problems with the World Wide Web

The World Wide Web (WWW) is a non-centralized computer information system that offers users a unique way of displaying publication media. It gives the user the ability to merge text with different forms of multimedia elements, such as sound, movies, and images. It also allows the user to link to other home pages via using the mouse to click on hyperlinks (addresses of files on web servers worldwide) embedded on the home pages (introductory hypertext documents). These hyperlinks allow a user to download different types of files, such as the sound files and movie files previously mentioned. It accomplishes this by allowing graphical web browsers to access its network (popular browsers include Netscape Navigator and America Online).

When the user views the home page via the browser, the contents of the home page are stored in his/her computer's random access memory (RAM). Unfortunately, the browser does not distinguish between a copyrighted work and a non-copyrighted work. The user must then make a decision as to whether or not to permanently save onto a fixed
medium any of the information he or she sees on the screen. It is very easy for someone using the “save” features of his or her browser to illegally copy a copyrighted work.

The WWW raises many legal issues because linked documents are stored anywhere in the world, not just on the information provider’s machine. Thus, the distributed information delivery makes it difficult to determine who is responsible for illegal copies that are being made. Sometimes the service provider will be directly liable for legally posting a copyrighted material on its home page if a subscriber illegally copies it. On the other hand, if the copyrighted material is only accessible through a hyperlink that the infringer must click on to receive the work, the service provider may only be contributorily or vicariously liable for the infringement. If an on-line service provider is not found to be directly liable, then it does not have to pay all of the damages incurred. In this case, one could argue that the on-line service provider should not be found liable at all if a subscriber establishes a link to an illegally copyrighted material not on its own server. This would be similar to finding the local phone company liable for publishing telephone numbers if one of its customers gets harassed over its service by someone using its directory book. The service provider could not possibly prevent all infringements from occurring.

2.3.3 Problems with Electronic Mail

The ease by which electronic mail (e-mail) users can copy and transmit material on the Internet has created many legal issues. According to Doug Isenberg, “[E]-mail has been defined as electronic communication of text, data, or images between a sender and
designated recipient(s) by systems utilizing telecommunications links." E-mail is the most widely used application on the Internet. Over one billion e-mail messages are sent every month, and this statistic grows continuously. America On-line has reportedly handled 1.5 million e-mail messages a day as of March 1995, up from only ten thousand a day exactly one year earlier.

Common e-mail transmissions of text may initially appear free from any legal difficulties. However, copyright infringement is more common than one might initially believe because an e-mail user may be unaware of the copyright law and "its applicability to [his or her] activity." For instance, when an e-mail user forwards another user's message to a third party, either in its entirety or just as a part of it, the sender usually infringes the original writer's copyright in his/her work.

Copies of digital works are conveniently made at almost every point in their deliveries and uses within computer networks. To read and use an electronic message the e-mail technology requires that at least one copy of the work be made. In the following passage, David Loundy describes all of the potential copyright infringements an e-mail system can make when delivering a message:

If a user sends a copyrighted work by e-mail, several copies are made in the course of transmission. First, if a user logs on to a service provider's computer, a copy of the work becomes fixed in the service provider's computer RAM, as the copyrighted work is entered into the e-mail program. Often, when the work is sent, a copy is then saved to the user's "out-box" on the service provider's disk drive, creating another copy. In the mean time, the actual e-mail may be sent to a mail handling computer, where the note will reside in RAM, and possibly on another hard disk. From here, the copyrighted note will be passed from computer to computer as it makes its way to the intended recipient. If a link in the network is down along the way, the note may be stored on some intermediate provider's computer until the note can be forwarded on its way. Finally, a copy is stored in the recipients "in-box." At some point, the sender's
service provider and the recipient’s service provider may back-up the
contents of their hard drives, making yet more copies of the work.
CHAPTER 3. PROBLEMS WITH COPYRIGHT ENFORCEMENT

3.1 INTRODUCTION

Though U.S. government officials have defined laws prohibiting copyright infringement on various electronic media, enforcement is another issue. Uncertainty arises from the vagueness of current copyright laws. Other problems occur from outdated laws that do not deal with copyright infringement on relatively new forms of electronic communication, such as the Internet and the World Wide Web.

Technology is already underway to prevent individuals and organizations from potentially infringing on publishers' copyrights. However, no standard form of technological copyright protection has been established. Until technology can physically help publishers protect their works, enforcement will have to rely upon government intervention in the form of new or updated laws, along with updated international treaties with other nations that effectively enforce copyrights.

3.2 Current Laws

Article 1, Section 8, Clause 8 of the United States Constitution secures authors' and inventors' exclusive rights to their respective writings and discoveries. Current U.S. copyright laws are defined in The Copyright Act of 1976, as amended in 1994. Because of the explosion of new technology available to communicate ideas and other copyrighted works over the Internet, the Copyright Act of 1976 is out of date and needs to be refined or amended to protect works published on this medium. In 1993, President Clinton’s
administration established the Information Infrastructure Task Force (IITF) to analyze and develop new proposals related to the current copyright act. This would articulate and implement the administration's vision for the National Information Infrastructure (NII). The task force released a report that offers some legal guidance on intellectual property rights over the Internet. The report is titled the *Lehman Report* (also known as the *White Paper*), named after Bruce A. Lehman, who is the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.

### 3.3 Problems with the Lehman Report

Although the Lehman Report addresses many of the current problems of the Copyright Act of 1976 regarding intellectual property rights in Cyberspace, it still leaves many issues unresolved. The IITF has left some of these issues intentionally unresolved.

One of the major problems is that it does not set a standard for on-line service provider liability. On-line service represents all computer networks and Internet provider services, including the World Wide Web and bulletin board services. The Lehman Report states that it is premature to establish a standard rule of liability, given the broad roles occupied by on-line services. These roles encompass on-line services functioning as electronic publishers, common carriers, and broadcasters. Thus, the IITF believes that liability issues should be handled on a case by case basis. Of course, this decision leads to further litigation, increased costs, and more uncertainty. On-line service providers could spend the extraneous time and money spent in court for more productive purposes.
Another major problem with the Lehman Report is that it states that on-line service providers, who fuel the commercial development of the NII, should bear some of the responsibility from infringing activities by users as a cost of doing business. The IITF concludes on-line providers also benefit financially from copyright infringement by their users. Thus, the task force believes charging the providers, as well as the actual infringing parties, would help alleviate more of the damages caused by copyright infringements.

The Lehman Report also states that exempting services from liability would inhibit development of tools that would aid in preventing infringement. However, this argument does not really resolve the issue of who is ultimately responsible for copyright infringement—the infringing user. By penalizing the service provider, the IITF is circumventing the real cause of the problem. Since technological tools to prevent copyright infringement are currently being developed and tested to catch copyright infringing parties at their sources, one could argue that making service providers liable for infringing users is unnecessary and costly. The development of technological tools aiding in the prevention of infringement are taking place whether or not courts find on-line service providers liable.

One of the most unclear issues in the Lehman Report involves derivative publications from prior copyrighted works. If someone scans a digital publication, then manipulates it to create a “new” work, are copyrights enforceable for the publisher of the original digital publication? The Lehman Report does not deal with these types of issues. It leaves it up to the courts to decide on an individual basis whether a digital publisher’s
rights have been infringed upon. In other words, there’s no single test that can determine the legality of, say, selling a collaged photo-illustration that contains a stolen-but heavily manipulated photo. According to the report, “‘it is unclear...whether a derivative work must be substantially similar to the prior work, or that it simply must incorporate in some form a portion of the prior work.’”23 The Fair Use doctrine may also complicate the issue if the derivative work is used for non-profit or educational purposes. This is related to how the Lehman Report deals with multimedia publications because it is unclear which laws apply to a collaged photo due to its inability to be placed into any one of the eight categories defined by the Copyright Act of 1976. Of course, this approach inevitably leads to time-consuming and expensive litigation.

3.4 International Environments

Protection of intellectual property in international environments continues to be a challenge to enforce for domestic countries’ publishers. Without taking into account, from the onset, rules for the effective protection of intellectual property, the development of the international Internet environment will be hindered. Trade barriers arising in differences in forms of protection and inadequate controls of piracy in the present system have been estimated to cause losses to domestic industries of twelve to fifteen billion dollars annually.24

To make the international information superhighway (now known as the Global Information Infrastructure (GII)) work for all parties involved, rules must be established to ensure protection for the works of intellectual property that move through international channels and into the emerging national infrastructures. The main obstacle to worldwide
protection of intellectual property in the global information infrastructure is that no international copyright laws exist in any area.

Currently, the global information superhighway will allow users in one country to manipulate information resources in another country in ways that may violate that country’s copyright laws. A major problem arises when the act that may be an infringement in one country may not be an infringement in another country. This is because copyright laws are territorial, and any attempt to enforce a copyright in another country would have to be constricted to the terms outlaid in current international and bilateral treaties dealing with intellectual property.

Two types of copyright protection exist in intellectual property agreements between countries: national treatment and reciprocal treatment. “A country can treat the other country’s nationals and works the same way that the country treats its own nationals, or the country can give the other country’s nationals the protection those nationals would receive in their home country. For ease of applicability and uniformity within a country, most treaties give national protection.”25

Just as the copyright laws in the U.S. need to be updated for the explosion in technology, so too must the international treaties be updated. However, most of the international treaties are not up-to-date on the copyright problems arising from such media as the Internet and the World Wide Web.
3.4.1 Different Connotations of the Copyright

A problem with international copyright protection is that nations often have legal systems which fall into one of two different categories. The U.S. and other Anglo-American legal traditions have "copyright systems," whereas other countries follow the "civil law" tradition. Conflicts occur in copyright protection enforcement between countries that use different types of legal systems.

Under the Anglo-American copyright system, the principle focus is to protect the author's economic rights. The theory of this system is that providing such protection will induce the creation of more works that will promote the progress of science to benefit the public.

However, the civil law tradition regards an author's rights as natural human rights, or non-transferable parts of one's right to personality. "Moral rights" of the author are essential parts of this system. These include the right of the author to be named as the author of a work and the right to object to any uses of the work that would dishonor or discredit the author's reputation.

The key difference between the copyright system and the civil law system is that in the latter the economic rights are subordinate to moral rights. Under the civil law system, only original works that reflect the author's personality are entitled protection. A system of "neighboring rights" protects those publications that do not meet the originality requirement. Neighboring rights, while similar in economic character to authors' rights, are protected at a lower level and are distinct from the higher-level rights granted to authors.
The rights protected by the copyright system are similar to neighboring rights under the civil law system. Thus, rights that are protected in the copyright system are subordinate to the rights of authors in civil law systems. Due to these extreme differences in theoretical bases of the copyright system and the civil law system, they are often in conflict.

3.4.2 Problems with Current International Treaties

3.4.2.1 The Berne Convention

The earliest international treaties covering intellectual property rights are the Paris Convention for the Protection of Industrial Property (U.C.C.) and the Berne Convention for the Protection of Literary and Artistic Works (the Berne Convention updates the U.C.C.). In addition to protecting literary, scientific, and artistic works, these treaties protect scientific research and computer software. They were created over a century ago, and have been updated many times. These are administered by the World Intellectual Property Organization (WIPO), a United Nations agency established in 1967.

The U.S. joined the Berne Convention on March 1, 1989. This process caused the U.S. to change its copyright laws to comply with the convention's provisions. After joining the convention, the U.S. had to allow a copyright duration of at least the author's life plus fifty years. The convention also forced each of its members to grant moral rights to the author. Other provisions included eliminating both the mandatory copyright notice and the mandatory deposit with the Library of Congress.
The Berne Convention extends protection of works that are protected in the country of origin to all other Member Countries. "The works must be first published by a national of a Member Country or be first published in a Member Country."²⁶ It is left upon each Member Country to consider when a work is published, fulfilling such requirements as tangible form or of general distribution. "A Member can enforce in another country the same rights that the nationals of that country would enjoy if the work was first published there."²⁷ Membership in the Berne Convention guarantees its nationals certain minimum rights, such as the right of paternity and integrity. This allows the author to claim ownership and object to a distortion of a work.²⁸

The major problem with the Berne Convention is that it is too lenient in allowing Member Countries the ability to define intellectual property for themselves. What constitutes intellectual property in one Member Country does not necessarily define intellectual property in another Member Country. For example, Canada does not recognize cultural materials (e.g., movies, books) as works that deserve copyright protection, while the U.S. does enforce copyright protection on these materials. This problem is compounded with the difficult task of defining copyright law dealing with an electronic medium. Software and other material on the computer is in a tangible form that can be protected by copyright, but what about computer images in transit over communication lines via the Internet? If an image is temporarily stored in RAM on a personal computer from someone residing in another Member Country, then does that meet the Berne Convention's copyright requirement of "fixation"? The Berne Convention does not answer these questions, and leaves it up to each Member Country's
government to decide. However, many of the Member Countries have not developed laws to deal with these technological issues.

Another problem with the Berne Convention is that the territorial aspects of the copyright law disappear when dealing with the Internet’s remote access features. The Internet allows an author present in one jurisdiction to create a copyrightable work within another jurisdiction, and to publish the work in yet another jurisdiction. The assumption that the author and his/her creation will be present at the same physical location is no longer valid, and leaves the status of such a work uncertain.29

Finally, the most important problem with the Berne Convention is that many nations are not members. To date, only 87 nations are members, and many developing countries (China) are conspicuously absent. The minimum amounts of protection to foreign authors and nationals can be sidestepped by citizens of non-member countries who do not need to follow the guidelines at all. The only hope of protection occurs if the country where the infringer is located is a member.

3.4.2.2 General Agreement on Tariffs and Trade (GATT)

The TRIPS Agreement

In the 1980s, the United States and other industrialized countries pressed to include international property rights in the Uruguay Round negotiations of the General Agreement on Tariffs and Trade (GATT), 1986-1993. Yet harmonization across countries regarding protection of international property rights remained low. The Uruguay Round accord broke new ground as signatories agreed to a comprehensive set of rules
establishing minimum standards for the protection of intellectual property rights and to stronger measures at international borders to stop trade infringing on these rights. Under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) accord, participants are obliged to rewrite their national laws to conform to internationally held norms for protecting patents, trademarks, copyrights, industrial designs, trade secrets, integrated circuits and geographical indications (the actual articles relating to protection intellectual property can be seen in Figure 1). Member states must not discriminate in favor of their own citizens against the copyright rights of foreigners who are citizens of other GATT member countries.30

TRIPS holds the following provisions to protect owners of copyrights:

- An obligation to comply with the provisions of the Berne Convention;

- An obligation that in respect of works other than photographs and works of applied art, the normal duration of copyright protection shall be at least fifty years from the death of the author;

- Fair use provisions and similar limitations on the exercise of copyright shall be limited to "certain special cases which do not conflict with normal exploitation of a work and do not unreasonably prejudice the legitimate interests of the right holder"; and

- Obligations to afford certain minimum rights for the protection of performers, producers of phonogram, and broadcasting organizations.

The accord also includes technological areas not currently protected in many countries. It expressly:

- requires protection of computer programs and data files;

- extends the right to authorize or prohibit commercial rental to owners of copyrights in computer programs and films, and to producers of sound recordings and any others that hold rights in a phonogram under a country’s domestic laws;
ensures the right of sound artists, recording companies and broadcast organizations to prohibit unauthorized copying and broadcasts.\textsuperscript{31}

\begin{figure}[h]
\centering
\begin{tabular}{|p{\textwidth}|}
\hline
\textbf{PART II: STANDARDS CONCERNING THE AVAILABILITY, SCOPE AND USE OF INTELLECTUAL PROPERTY RIGHTS} \\
\textbf{SECTION 1: COPYRIGHT AND RELATED RIGHTS} \\
Article 10 \\
Computer Programs and Compilations of Data \\
1. Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971). \\
2. Compilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself. \\
Article 11 \\
Rental Rights \\
In respect of at least computer programs and cinematographic works, a Member shall provide authors and their successors in title the right to authorize or to prohibit the commercial rental to the public of originals or copies of their copyright works. A Member shall be excepted from this obligation in respect of cinematographic works unless such rental has led to widespread copying of such works which is materially impairing the exclusive right of reproduction conferred in that Member on authors and their successors in title. In respect of computer programs, this obligation does not apply to rentals where the program itself is not the essential object of the rental.\textsuperscript{32}
\end{tabular}
\caption{(From the TRIPS accord)}
\end{figure}

Although the TRIPS agreement establishes substantially higher standards of protection for a full range of intellectual property rights than are embodied in current international agreements such as the Berne Convention, it still fails to define standards for works published on the Internet. Under the GATT, each nation retains the sovereign right
to define intellectual property within loosely defined limits of “national treatment”.

However, this leaves certain issues about the Internet unresolved. One such problem is whether a “copy” of a work stored in RAM by an Internet browser requires copyright protection. Some countries may regard these types of works as deserving copyright protection while others may not.

Another problem is whether a country can provide copyright enforcement for a digital work physically passing through international borders via the Internet. If enforcement of copyrights means that the work must be in some tangible (fixed and recognizable) form while in transit, then there is no way of stopping copyrighted works in one country from entering through the borders of another because works flowing through the Internet are not tangible. Thus, copyrighted material cannot be checked before it enters into another country. The copyrighted material is enforced only after it has had a chance to circulate in another country before it is detected.

3.4.2.3 The North American Free Trade Agreement (NAFTA)

On January 1st, 1994, The North American Free Trade Agreement created the world’s largest free trade area by implementing a phase out of all tariffs on goods originating in Canada, Mexico, and the United States. It also provides a higher level of intellectual property right protection than any other bilateral or multilateral agreement. Specifically, NAFTA provides:

- a comprehensive definition of intellectual property rights (Article 1701, 1703 define intellectual property rights as copyright and related rights, trademark rights, patent rights, rights in layout designs of semiconductor integrated circuits, trade secrets rights, plant breeders’ rights, rights in geographical indications and industrial design rights);
• fixing minimum standards for intellectual property protection, set forth in express provisions and by reference to international treaties; and
• "requiring each party to accord to nationals of another party, ‘treatment no less favorable than’ it accords to its own nationals.”

Further, “NAFTA requires each party to extend copyright protection to all works covered by Article 2 of the Berne Convention, as well as any other works embodying original expression.” NAFTA’s provisions for copyrights include protecting computer programs as literary works and databases as compilations for a minimum of fifty years. NAFTA also provides rental rights for computer programs and sound recordings and contains extensive provisions for intellectual property rights enforcement.

The major problem with NAFTA concerning intellectual property rights is that the agreement is shaped in part by each party’s domestic laws. Thus, it cannot be approached as a uniform and symmetrical entity, and “tread[s] softly in certain areas that one or another party has traditionally been reluctant to change.” For instance, NAFTA preserves Canada’s right to take whatever action regarding cultural materials (i.e., motion pictures, records, and books) it deems in its national interest, “raising fears of possible quotas and the exclusion of artistic products from the U.S. and other countries.” Thus, some of these cultural materials that are digitized on the Internet will not receive copyright protection in Canada.

Another problem with NAFTA is that it does require the U.S. to comply with Article 6 of the Berne Convention, “which sets forth certain ‘moral’ rights to protect against misattribution and mutilation or alteration of an author’s work.” NAFTA and the Berne Convention typically grant moral rights to author’s works and allow them to assert these rights on copyright interests transferred to another party. However, the U.S.
refuses to acknowledge such moral rights because U.S.-based multinational companies have stressed that any explicit protection of them would make the resultant NAFTA unacceptable to U.S. industry. The U.S. industry believes that economic rights (profits) will decline if moral rights are put ahead of them, which is what happens to industries in countries that recognize moral rights.

One last problem with NAFTA is that it has hidden obstacles for those parties seeking recovery of statutory damages and attorneys’ fees for copyright infringement. Under U.S. law, a party must register with the U.S. Copyright Office prior to an infringing activity to allow for recovery of statutory damages and attorneys’ fees. However, it is more difficult for foreign nationals to seek this type of recovery because they have not registered with the U.S. Copyright Office. Thus, there is a requirement for a pre-infringement registration under the Berne Convention. However, this requirement is not publicized and remains hidden to foreign nationals to “bar such foreign authors from those remedies.” NAFTA does nothing to change this situation.

3.4.2.4 International Convention for the Protection of Performers, Producers, of Phonograms and Broadcasting Organisations (The Rome Convention)

The Rome Convention “addresses neighboring rights relating to the work of performers, manufacturers of records, and broadcasters.” Article 12 of The Rome Convention requires that an equitable payment be made to the performers or the producers for broadcasting or communicating any recording to the public. “A member may reserve not to grant the benefits of Article 12 to producers which are not from a
member country and limit protection to those from member countries "to the extent to which, and to the term for which," that country protects.\textsuperscript{11}

The major problem with The Rome Convention is that it is outdated. It was developed in 1961, and came into effect in 1964. New technology dealing with neighboring rights is not addressed in the treaty. Neighboring rights are applied to protect the rights of producers of phonograms, performers, and broadcasters. These rights, while similar to authors' rights, are protected generally at a lower level and are entirely separate and distinct from the higher-level rights granted to authors.\textsuperscript{42}

Works published on the Internet in countries that are a part of The Rome Convention do not necessarily satisfy the "fixation" requirement. The treaty does not explicitly define fixation, thus copyright infringers could get away with arguing that the works on the Internet are not fixed. Fortunately, not many countries have agreed to the treaty. However, fixation in these countries quite often is defined in other international treaties.
CHAPTER 4. PROPOSED SOLUTIONS

4.1 INTRODUCTION

To combat copyright infringement on the Internet, a collaborative approach must be taken by individuals, corporations, and nations throughout the world. Three primary components comprise the proposed solution of global protection of copyrights on Internet. The first is updating laws established by domestic and international agencies, thereby adapting to the National Information Infrastructure and Global Information Infrastructure currently being researched by the U.S. government and other nations. The second component is implementing technological solutions to search for copyright infringement on the Internet, as well as preventing copyright infringement from occurring. The final part of the solution is to educate the public about what copyright infringement is, as well as the consequences of committing the infringements.

4.2 Proposed Amendments to Domestic Laws

Enforcing copyright protection on the Internet within the U.S. involves updating the Copyright Act of 1976. The Lehman Report should be incorporated into the act with a few revisions. The Lehman Report should address multiple copies made in domestic and international e-mail networks. Due to the inherent instability of the Internet, e-mail can get postponed and rerouted. This creates the need to temporarily make copies of the message at various stages in its delivery route (on different computer networks) to ensure that the message arrives correctly at its destination. Thus, the Lehman Report should allow for multiple copies of an e-mail message without considering it an act of copyright
infringement. To keep e-mail messages from getting intercepted and illegally copied along their delivery routes, they should be encrypted to deter copyright infringement. E-mail encryption technology is currently available and should not be a burden to those seeking copyright protection.

The Lehman Report should also make it clear whether derivative works must be similar to prior works, or that it simply must incorporate in some form a portion of the prior work to constitute copyright infringement. If one compares derivative works to paraphrasing of another author’s exact words in a text, then an act of copyright infringement has occurred if the original work is not cited or, if for commercial use, the original artist has not issued a license. Multimedia works are often derivative pieces and should be placed into a new category of material to be protected by copyrights because it does not really fit into one of the existing eight categories. This would allow one set of copyright laws to be legally enforceable upon all multimedia works.

Finally, the Lehman Report should set a standard as to whether on-line services should be directly, contributorily, or vicariously liable for what their subscribers post on their systems. The courts have been inconsistent on this issue, and this is evident when comparing the different rulings from the Playboy Enterprises Inc. v. Frena and Sega Enterprises v. MAPHIA cases. In the Church of Scientology v. NetCom case a few months ago, a federal court in California ruled that an on-line provider may be liable for copyright infringement if it knew, or had the capability to know, that an unauthorized copy of a copyrighted work was being posted on its system and was able to take simple measures to prevent further damage to the copyright owner. The case remains
unresolved, and the court is trying to determine when NetCom knew it was allowing transmission of copyrighted material and what it could have done to stop it.\textsuperscript{43}

4.3 Proposed Amendments to International Treaties

Enforcing copyright protection in the international environment involves updating international treaties containing intellectual property provisions. Because there is no international copyright law that exists, a \textit{Digital Arbitration Board of Virtual Magistrate}\textsuperscript{44} could be developed by the World Intellectual Property Organization (WIPO) that is responsible for many international treaties. This board would oversee allegations of copyright infringement and refer such claims to a neutral entity, composed of experts on copyright law and the Internet, which could then give a preliminary ruling whether an infringement has occurred. This provides real-time decision-making capability, which many advocates of digital dispute resolution favor.

Due to the Internet's global nature, the Berne Convention treaty needs to include the definition of intellectual property instead of letting individual countries develop their own definitions. An amendment to the treaty should be made to include computer text, image, sound, and movie files to be included in the definition of intellectual property. The definition would also clarify whether computer files in RAM satisfy the fixation requirement. Also, since the Berne Convention assumes that a copyrighted work is created and published in the original creator's jurisdiction, an amendment should be made to alleviate the problem of whether an author's work deserves copyright protection if he or she does not live in the same jurisdiction where the work was created or published.
The General Agreement of Tariffs and Trade (GATT) suffers from the same lack of provisions as The Berne Convention for dealing with technology such as the Internet. GATT too lets individual countries develop their own definition of intellectual property. Thus, the same proposed amendments stated above that add the definition of intellectual property to the Berne Convention can be added to the GATT. The *Digital Arbitration Board of Virtual Magistrate* could then resolve infringement cases of copyrighted material flowing across a country's border because a definition of copyrighted material will exist for works on the Internet.

NAFTA also needs to be updated for issues dealing with copyright infringement on the Internet. Canada has traditionally ignored copyright protection for cultural materials (motion pictures, records, and books). Because of the global nature of the Internet, those materials must be protected in the other countries participating in NAFTA. Canada must realize that works on the Internet cannot willfully be kept from entering the country like tangible cultural materials (such as the actual motion pictures, records, and paperback books). Therefore, an amendment should be made to prevent Canada from freely copying protected works on the Internet.

Finally, the Rome Convention should be updated to resolve the fixation requirement for works on the Internet. This amendment can be virtually identical to the aforementioned proposed amendment that defines intellectual property for all member countries for the Berne Convention.
4.4 Current Possible Technological Solutions

Technology allows two different approaches to deter copyright infringement on the Internet. The first one involves developing technology targeted for specific on-line systems (i.e., the World Wide Web) that recognizes copyright infringements once they have occurred. The second approach is to use technology to prevent copyright infringement from happening by establishing restrictions at the source of the copyrighted material.

The first technological solution is to detect copyright infringement once it has occurred, computer scientists at Stanford University have developed a copy detector named SCAM (Stanford Copy Analysis Mechanism). Literature that is stored in digital libraries can be scanned automatically by copy detectors such as SCAM. SCAM detects plagiarism, copies, extracts, and extremely similar documents in digital libraries. This prevents potential plagiarists from relying on the incredible size of electronic literature to avoid detection. If more agencies--such as national governments--begin to implement “watch-dog” technology such as SCAM, copyright infringement will significantly decrease. Even if the technology is not perfect, it is still effective enough to scare potential infringers.

The second technological solution involves restricting access to copyrighted works by implementing a contractual agreement. If someone wants access to a copyrighted material, than that person must pay a fee to the copyright holder. The copyright holders can achieve this by developing an encryption system to encode copyrighted electronic information. Then they can distribute a decryption key to
authorized persons who have paid the license fee. Copyright protection systems are already under development to support this solution.

Wade Riddick, a graduate student and a former National Science Foundation Fellow, proposed his *teleright* document would be an application capable of informing its publisher about its use:

Each [application] would be encrypted with a unique key and would stay encrypted whenever stored on fixed media. The document would fetch the key from the publisher when someone wanted to view it and decrypt itself into a tamper-resistant part of RAM. Sending a key would be less expensive than resending the whole document, which is the Ted Nelson/pay-per-view solution. When the person was finished with the document, the document would notify its publisher and erase itself.45

In addition to Wade’s *teleright* system, other organizations are researching methods of trying to take advantage of encryption technology to stop copyright infringement. IBM has developed the *Cryptolope* container that is essentially an encrypted envelope that wraps around software and other copyrighted works. Then it transparently unwraps itself once the end user agrees to the contract for use of the intellectual property. “These terms are found in an abstract listed on the outside of the envelope and include a description of the content, its length, cost, limits, and even advertisements or coupons that can accompany the information or product being sold.”46 Technology that prevents copyright infringement from happening shows much promise in the future because one can use it to prevent anyone in the world from gaining unauthorized access without worrying about whether or not copyright laws apply internationally.
Although current technological solutions that prevent copyright infringement from happening at its source (i.e., the aforementioned telearight document and Cryptotope systems) show great promise, limits to the effectiveness of such solutions abound. After the user successfully decrypts a document for viewing, what prevents that user from making duplicate copies?

Technological solutions that deter copyright infringement on the Internet should allow its users to continue to have access to free flowing information posted by those who do not mind if their works get duplicated. The original intention of free flowing information is what attracted the Internet to so many users in the first place. Thus, technological solutions to stop copyright infringement should take this into account when users have a need to copy works not requiring authorization to do so. The solution to this problem is complex because while we do want to protect the copyrights of publishers on the Internet, we do not want to create an environment that deters users from searching the Internet for freely available information.

An effective solution would allow the publishers of copyrighted works to be responsible for providing protection to their copyrighted works. Although it could be debated that responsibility of copyright protection should be placed on on-line service providers or Internet browsers, this responsibility would inhibit subscribers from easily accessing free flowing information that does not have copyright restrictions. Consequently, the denial of free flowing information would decrease the subscriber's incentive to use the Internet. By placing the responsibility of technological copyright protection on the publishers of the copyrighted works, users would have an incentive to
use the Internet because they still have the ability to search for free flowing information that is not copyrighted.

4.4.1 Proposed Improvements to the Technological Solutions Currently Available or Under Development

4.4.1.1 Introduction

Placing the responsibility of technological copyright protection on the original publisher allows one to establish different levels of copyright protection to one’s works. Depending on the amount of protection required by the creator of the work, technological solutions can be developed for the broad spectrum of users’ needs of copyrighted documents, ranging from letting the user download and seeing the document only once to letting him/her view it for as long as he or she desires. As the information technology society moves toward a more network-centric environment, publishers will be able to control the number of duplicate copies Internet subscribers can make of copyrighted works by establishing accounts. Network-centric computing allows end-users to “receive disposable, just-as-needed, just-in-time software stored in retrievable applets on the internet rather than the hard drive, and accessed by a $500 ‘internet appliance,’ small computer.”

4.4.1.2 Recognition of Varying Degrees of Copyright Protection

Some works may need a greater level of copyright protection than others (i.e., not allowing anyone to make any copies of a work). For instance, an extremely confidential
note about certain strategic business decisions within a company may need an extremely secure level of copyright protection. This type of information must only be seen by the intended party, and no one else. This may entail letting the authorized user to access the document only once, and not letting him/her make any copies of it.

On the other hand, a copyrighted work may only need enough copyright protection to prevent the masses from getting an illegal copy of it. In this case, the publisher may want to allow the user to make a limited number of copies for his/her personal use. For example, users may need to copy and store works that they have downloaded from the Internet so that they can view them again at a later time for their own personal use. Oftentimes users will download a document that is too long to read at one time, so they may wish to put a copy of it on a permanent disk.

No matter which level of copyright protection is required, the technology should prevent potential copyright infringers from easily duplicating the copyrighted work. It is important to note that the technological protection of copyrighted material should make the act of copyright infringement more costly to the potential infringer than the value of paying the publisher for the viewing rights of the original document. This will prevent illegal distribution of copyrighted works to large numbers of people.

4.4.1.3 Technological Solution Using the Emerging Network-Centric Environment

This broad approach can be achieved by permitting publishers of copyrighted works to take advantage of developing network-centric environments that allow Internet users to establish individual accounts. This would allow the publisher to make his/her
copyrighted works available in very secure encrypted formats or very unsecured encrypted formats (and anywhere in between these two extremes). For instance, the very secure encrypted formats could be used for the previously mentioned confidential business decisions, while the relatively unsecured encrypted formats could be applied to less confidential information. Every encrypted format would require the user to request a dynamically generated decryption key, which the publisher would send to the user after he or she agreed to the terms of the copyright contract and paid the appropriate royalty fees. The network-centric approach would allow those users with valid accounts to access the copyrighted works that they have already paid for as many times as they would like without charging them.

For those users who wish to download a copy to a permanent disk for viewing at a later time, the network-centric approach would allow the user to make multiple copies for lower level security documents. Lower level security documents are defined as those types of documents that the original author would give exclusive rights for users to make multiple copies. In fact, the publisher would be able to control how many copies of each copyrighted work could be made by a valid user. The followings steps contain the algorithm to implement this plan:

STEP 1: When the user sees an encrypted file for a copyrighted work on the Internet, he or she can request a dynamically generated decryption key from the author. This decryption key contains a mini-program embedded inside of it to allow the publisher to set the number of copies the valid user can make, ranging from zero to the maximum number the publisher selects. The key also temporarily disables the cut-and-paste features of the notepad on the specified system the user is working on.

STEP 2: The author then transmits the decryption key to the user. To prevent unauthorized users from capturing the decryption key enroute to the authorized user, the key can be broken up into packets. Each of these packets can be sent along different routes to arrive at the correct destination. Hence, anyone intercepting one particular
packet of the key will not be able to open the encrypted file. Also, the entire key is hidden in RAM and invisible to the validated user because it is not displayed on the screen.

STEP 3: Once all of the packets of the decryption key have been received, it automatically decrypts the encrypted work.

STEP 4: The user can then view the work for as long as he or she wishes.

STEP 5: The decrypted file allows the user to copy it to the user’s destination disk as many times as desired. However, the copies of the file on the permanent disk cannot be viewed because they still need the decryption key hidden in RAM. The key can only be accessed and permanently embedded into the copied files’ programming codes the number of times set by the author before it self-destructs and notifies the publisher. Thus, the user can only make the necessary number of allotted copies at the time he or she requests the key. If he or she turns off the computer, then no addition copies can be made because the RAM is erased.

STEP 6: To prevent the decrypted files on the user’s permanent disk from being copied to another destination, the files create dynamically generated decryption keys in hidden files somewhere else on the user’s permanent disk. Each time the copyrighted files are accessed, they ask for the decryption keys in the hidden files. Thus, successfully duplicating the copyrighted files will be very difficult because they will not have the dynamically generated decryption keys in the hidden files.

4.5 Educating the Public

The electronic environment should post frequent and highly visible notices where copyrights exist. Public awareness campaigns tell people of the costs of infringement and the possible penalties will help to decrease the incidence of infringement. This could be implemented in domestic copyright laws and international treaties dealing with intellectual property. Education and an ethical code will make people realize the costs of infringement and will create an incentive to follow the law for the personal reward of being ethical. This code should make it harmful to a person’s reputation if a person infringes or helps others to infringe.
Conclusion

The Internet poses copyright problems that individuals, organizations, and governments can solve if they work together to develop and implement the proper solutions. Legislation will always be one step behind relatively new technological advances such as the Internet, so these legislative bodies must do their best to predict what types of technology will emerge that will again challenge existing or developing copyright laws. Copyright disputes will be much easier to solve if one international body exists to govern infringements occurring between nations. Technological solutions are critical in preventing and detecting copyright infringement, as well. Together, legislation and new technology will help stop copyright infringement on the Internet.
ENDNOTES

5 “U.S. Copyright Act, as Amended..Chapter1. Subject Matter and Scope of Copyright”, http://fatty.law.cornell.edu/usc/17/101.html#literary work_101 (29 May 1996).
6 “U.S. Copyright Act, as Amended..Chapter 1. Subject Matter and Scope of Copyright”, http://www.law.cornell.edu/usc/17/101.html#computer program_101 (29 May 1996).
7 “U.S. Copyright Act, as Amended..Chapter 1. Subject Matter and Scope of Copyright”, http://www.law.cornell.edu/usc/17/101.html#derivative work_101 (29 May 1996).
8 “U.S. Copyright Act, as Amended..Chapter 1. Subject Matter and Scope of Copyright”, http://www.law.cornell.edu/usc/17/101.html#compilation_101 (29 May 1996).
9 “U.S. Copyright Act, as Amended..Chapter 1. Subject Matter and Scope of Copyright”, http://www.law.cornell.edu/usc/17/107.html (29 May 1996).


LIST OF REFERENCES


