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I. INTRODUCTION

Copyright infringement in cyberspace is so rampant that many have now acquiesced to the idea that it cannot be stopped or even curtailed. Fully twenty-three percent of Americans now say they have downloaded "free" music on the Internet.\(^1\) As a result of this so-called online file sharing, compact disc sales have now fallen for the first time in history.\(^2\) Despite enhanced copyright protections offered by the Digital Millennium Copyright Act of 1998 ("DMCA")\(^3\) and copyright-friendly decisions in the courts,\(^4\) copyright abuse not only continues, it now threatens to


\(^{2}\) Id. (stating that recent compact disc sales indicate a ten percent decline in overall sales).


\(^{4}\) See e.g. A&M Records v. Napster, Inc., 239 F.3d 1004 (9th Cir. 2001) (groundbreaking decision outlawing certain types of peer to peer file sharing found to facilitate copyright infringement); see also UMG Recordings, Inc. v. MP3.Com, Inc., 92 F. Supp. 2d 349
escalate beyond all control.

Many believe this sort of rampant infringement is a long overdue breath of fresh air that will lead the United States back towards more free and fair use of intellectual property.\(^5\) Others fear that without strong and enforceable intellectual property protections, the number of quality, desirable artistic creations will fall dramatically. In fact, many believe that uncontrollable intellectual property infringement will ultimately hamper the Net's usefulness to the extent that artists simply begin withholding future works from the Internet for fear of infringement.\(^6\) The author of this paper falls into this latter category.

This paper explores the problem of copyright infringement on the Internet, then proposes a specific solution to the problem that combines both legal and technical aspects to produce a reliable and useable form of copyright control. Specifically, it proposes an exemplary form of technological protection measure as set forth in the DMCA.\(^7\) The paper goes on to demonstrate how difficult changes, such as those proposed, generally face hurdles in all directions.

Alternate solutions abound. Some commentators suggest that legislation alone can remedy the current situation. Others believe that private industry can, by itself, solve the problem. This paper posits a solution that falls somewhere in the middle. The proposal set forth in this paper is one of only a few means available with the capability to actually stop copyright infringement on the Internet. In fact, it is the only means available that can stop copyright infringement at its source—the electronic file itself. Such a remedy, however, is only achievable through a combination of private sector development and legislative requirements. Fortunately, at least one success story—in the form of DVDs—already exists to show that it can be done.

The solution offered by the author builds upon the legislative efforts

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\(^5\) See e.g. John Therien, Exorcising the Specter of a “Pay-Per-Use” Society: Toward Preserving Fair Use and the Public Domain in the Digital Age, 16 Berkeley Tech. L.J. 979 (2001) (arguing that copyright owners should not have the power to stop purchasers from distributing copies of copyrighted works on the Internet, and that those copyright owners who seek to stop copyright infringement of their works on the Internet should have their copyrights removed).

\(^6\) See Lawrence Lessig, Who’s Holding Back Broadband?, Wash. Post. A17 (Jan. 8, 2002) (stating that one of the fundamental reasons consumers are slow to adopt broadband is that copyright owners are withholding quality works from the Internet for fear of losing control once those works are made available on the Internet).

\(^7\) See 17 U.S.C. § 1201(a) (prohibiting circumvention of technological protection measures).
seen in the early days of DVD\textsuperscript{8} development. DVDs have enjoyed success as a protectable new media format for two reasons. First, private industry developed the format and, second, Congress required all hardware manufacturers who sold devices using the format to adopt anti-copying Serial Copy Management System features contained in all DVDs.\textsuperscript{9} Belying all predictions of doom, the result has been a tremendous success.

This paper proposes a hypothetical new media format whose implementation should follow the same approach. The proposed new format contains an underlying and invisible protective code called MediaKey\textsuperscript{Tm}. In essence, the MediaKey\textsuperscript{Tm} system is a specific form of technological protection measure\textsuperscript{10} that copyright owners will utilize to prevent infringement of their works set forth in electronic media. Just as with DVDs, private industry must develop hardware that takes advantage of protective features found in MediaKey\textsuperscript{Tm} and Congress must play a key policy role by requiring its adoption. Most importantly, the new media format must implement the MediaKey\textsuperscript{Tm} system in a simple, functional, and usable manner so that the benefits of using it outweigh the costs of business as usual.

Part II of this paper discusses factors underlying the rise of rampant copyright infringement on the Internet and the potential costs of non-intervention. Explosive, unregulated growth has benefited society immeasurably. Yet, much of what drives this growth—unmitigated copyright infringement—also threatens to severely damage development of future copyrighted works. Such a result could be disastrous when one considers that the U.S. copyright industry comprises five percent of today's multi-trillion dollar economy. The resulting high-price-infringement cycle portends a dire future awaiting both copyright owners and consumers without effective copyright infringement prevention tools.

\textsuperscript{8} See SoYouWanna.com, So You Wanna Buy a DVD Player? § How DVD's Are Created <http://www.soyouwanna.com/site/syws/dvd/dvd.html> (accessed Feb. 24, 2002). “DVD” stands for Digital Video Disc (or Digital Versatile Disc as the British seem to prefer). It is a disc that is 4.75 inches in diameter, “1.2 mm thick, and can store 8.5 gigabytes of data on one side (or the equivalent of about 6,800 floppy disks).”

\textsuperscript{9} 17 U.S.C. § 1002(a) (mandating inclusion of Serial Copy Management System (SCMS) in every enumerated digital audio recording device). This section is part of the Audio Home Recording Act (AHRA). The AHRA prevents second generation copying of DVDs by mandating that all hardware capable of playing DVDs implement the SCMS scheme. In other words, all legal DVD players sold in the U.S. must implement the SCMS system to prevent functional copies being made from copies. In this way, fair use is preserved because legal purchasers can make one legal copy of the DVD purchased, but no subsequent copies can be made from that copy.

\textsuperscript{10} 17 U.S.C. § 1201(a). Technological protection measures—as described in the DMCS—are a means for protecting electronic works from illegal copying and unauthorized use. \textit{Id.}
Part III contrasts pure market versus pure legislative approaches and illustrates why neither approach fully solves the problem. The DMCA offers a promising start but falls short of the measures needed to stop ever-escalating copyright infringement. Partial and intermediate solutions will have little effect on future infringement. A combination of private sector and federal government efforts offers the only comprehensive solution.

Part IV presents the better solution—MediaKey™—and fully details every aspect of its implementation and use. Once artists and creators have the ability to effectively control access to their works embodied in electronic format, the Internet will experience another explosion in growth as artists and recording associations begin offering far more of their wares online. Those who fear such effective controls, and worry that they spell the end of fair use, should consider the benefits offered by effective controls. Once implemented, MediaKey™ offers unparalleled and unlimited options to both copyright owners and consumers. When that day arrives, consumers will enjoy vastly increased choice when selecting their music and videos. Once copyright owners feel safe from online infringement, the quantity and quality of copyrighted works available online will grow exponentially, once again restoring the balance and purpose copyright laws intended.

II. COPYRIGHT INFRINGEMENT ON THE NET: WHY THE PROBLEM IS GREATER THAN YOU THINK

The past decade has witnessed extraordinary turmoil in the field of intellectual property in general and copyright in particular.11 New technologies enable anyone to create new works of literature, music, art, film, and software and to instantaneously disseminate those works to others around the globe. In a world in which everyone is a content provider and content user, little wonder that old social, economic, and legal paradigms are now under fire. Little wonder, too, that all major players are scrambling to solve the problem of online copyright infringement. Congress attempts to accommodate the private sector and public interests, courts attempt to resolve litigative conflict, and the Copyright Office attempts to study, elucidate, and implement rapidly evolving congressional commands. As never before, all parties have become energized and engaged by copyright disputes—the Napster case being one obvious example—and major lawsuits often move quickly from the courtroom to the negotiation table at which new business models are devised. Nonetheless, opinions on Internet copyright infringement vary considerably depending on who addresses the question.

Many Internet users believe that copyright infringement is not a problem. Others believe that it is and wonder how the problem ever got so out of control. This section details how the meteoric rise of Internet use, together with a lack of regulation, has produced the state of rampant copyright infringement artists and creators now face. Such explosive growth has produced both costs and benefits. One of the most alarming developments is what this author has coined the high-price-infringement cycle, which now threatens to spiral out of control unless effective measures are immediately taken to stop rampant growth of copyright infringement on the Internet.

A. THE INTERNET AND ITS UNBRIDLED GROWTH

The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location. “The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure.” But what is it?

The Internet is a large computer network through which home users, online retailers, businesses, governments, etc. can communicate. Reduced to its most basic form, the Internet is a network of networks that allows perhaps a billion computer users around the world to access each other using anything from a palm pilot to a large mainframe. The World Wide Web is a tool for viewing information available on the Internet. When the Web was first established approximately ten years ago, Internet browsers did not exist. Scientists and researchers using the World Wide Web had little need for hyperlinks when the only information available was text-based. With the introduction of new forms of information on the Internet, especially graphics, Internet browsers were

13. The Internet is one part of what is commonly referred to as “Cyberspace” or the “Information Superhighway.” This area of “Cyberspace” is where most online transactions occur. Throughout this paper, the author uses the terms “Internet” and the “Net” interchangeably to refer to this portion of “Cyberspace.”
14. Liener, supra n. 12, at ¶ Formation of the Broad Community. “The recent development and widespread deployment of the World Wide Web” (invented by Tim Berners-Lee of MIT’s Laboratory for Computer Science) “has brought with it a new community, as many of the people working on the WWW have not thought of themselves as primarily network researchers and developers.” Id.
developed to view the information directly, while on the Web.\textsuperscript{15}

The browser had a profound effect on use of the Internet. Once the Internet was dragged from the old cumbersome, DOS-like typing method into the world of point-and-click, Internet use became easier and more enjoyable. It took very little time after this development for the rest of the world to catch-on that this Internet thing might be useful in other ways. Internet usage, as measured by the number of available Internet-connected servers during this period, increased from 250 servers in 1993 to 2500 servers in 1994.\textsuperscript{16} Today, this number ranges in the millions of servers.\textsuperscript{17} No governing body regulates the Internet and its explosive growth has caught many by surprise.

B. DRAWBACKS OF UNCHECKED EXPANSION

Unfortunately, this lack of rules and virtual anonymity has created an entitlement mentality among many users.\textsuperscript{18} Children now think they no longer need to pay for music. What is worse is that their parents generally support that idea because they save a fortune on CDs.\textsuperscript{19} Many users simply believe that because they are currently able to commit unbridled copyright infringement on the Internet they should be able to do so forever. Such an attitude combined with the relative ease of dissemination and near absolute anonymity on the Internet, has allowed heretofore-unimagined copyright infringement. Thus, we see an explosive growth in the availability of unlicensed—copyright infringing—creative works online. Many ask: how did we arrive at this point?

Perhaps the answer is simpler than one might imagine. Perhaps the Internet works too well. It provides anonymous exchange between users, who can send and receive anything electronic paths of the Internet allow. At present, near exact copies of software, music, voice, visual art, and text can easily and quickly be created by even novice computer users and transmitted to other anonymous users with only a few keystrokes. Again: how did we arrive at this point?

\textsuperscript{15} Robert Cailliau, A Short History of the Web § 1994 <http://www.netvalley.com/archives/mirrors/robert_cailliauspeech.htm> (accessed Nov. 7, 2002). In 1994, Jim Clark founded MCC (which later became Netscape Corp.) and hired programmers to create an Internet browser, which later became the popular Netscape Internet browser. Id.

\textsuperscript{16} Id. at §§ 1993, 1994.

\textsuperscript{17} See Telecordia NetSizer Tool <http://www.netsizer.com/index.html> (last visited Feb. 22, 2002) (according to this site, nearly 200 million servers are now available on the Internet, with an average increase of 10 per second).

\textsuperscript{18} See Adam P. Segal, Dissemination of Digitized Music on The Internet: A Challenge to the Copyright Act, 12 Santa Clara Computer & High Tech. L.J. 97, 99 (Feb. 1996).

Once again, the answer is simpler than some might imagine. Technology has virtually always outpaced the law, but the Internet takes this concept to another level. The Internet allows exponential improvements in technology by doing exactly what it was designed to do—promote exponential improvements in technology.

C. Unchecked Copyright Infringement and Its Costs

With this surge in technology comes inevitable drawbacks. Free access means little or no transaction costs for the user. If you can get it and give it free, why pay for it? Hence the reason so many users simply choose to engage in illegal copying when the transaction costs are nearly nonexistent. The rarely considered problem, however, is that while it is free to online pirates, it is not free to copyright owners or legal purchasers of the same media. This zero-transaction-cost piracy is actually more appropriately viewed as a transaction cost realignment for copyright owners, copyright infringers, and legal purchasers. The normal alignment of costs to produce (supply) and costs to buy (demand) are skewed into a new alignment of costs to produce plus costs to offset piracy, which ultimately result in increased costs to purchase. The key, then, exists in finding a way to realign transaction costs so that legal consumers are not taxed with the bill for online piracy. This paper presents such a solution.

Before the solution is presented, however, some additional detailed exploration of the costs involved is necessary.

1. The High-Price-Infringement Cycle

One of the most insidious effects of unchecked copyright infringement is the resultant high-price-infringement cycle. Figure 1 (Appendix A) indicates a normal demand curve illustrating original consumer surplus in area A and producer revenue in area B. In this example, before the cycle starts the normal price is five dollars, and the normal quantity sold is 1000 units. After infringement begins, the price shifts dramatically as depicted in Figure 2 (Appendix B). An example best illustrates how the cycle progresses from beginning to end.

The vicious cycle occurs in the following way. First, a copyright owner releases a work to the public by selling, for example, a compact disc (CD) containing her music. The purchaser takes this CD home and listens to it. At this point, the cycle remains lawful and no effects are observed. However, let us now say that the same purchaser then converts the enclosed songs into MP3 format\(^{20}\) and distributes them over

\(^{20}\) A popular digital format commonly used for so-called online "sharing" of music files.
the Internet by means of an online music sharing service. Now the vicious cycle begins.

To compensate for the loss due to infringement, the copyright owner (producer) increases the price of the next CD sold. The next lawful purchaser then pays a higher price to subsidize the piracy loss. As the cycle continues with each incremental increase in price, the demand for lawful copies of the work decreases and the demand for pirated copies increases. Figure 2 illustrates two demand curves depicting the demand for both legal and illegal copies of the CD. In this illustration, the primary losers are subsequent legal purchasers, who lose both the lower shaded area of consumer surplus and eventually the upper shaded area as well. Figure 2, as a snap shot in time during the infringement, illustrates a new artificially inflated price of eleven dollars and quantity demanded down to nearly 400 units. The area between the original price and artificially inflated price illustrates a reduction in the overall legal market for these CDs. As online infringement escalates, the artificial shift in supply and demand causes escalating losses in legal consumer surplus, depicted by the shaded area labeled “Loss of Surplus” to “Legal Consumers: Area of Primary Concern.” This area below the legal demand curve indicates where most of the problem lies.

Consumers who originally fell on the upper demand curve by choosing to purchase the CD legally, now fall to the lower demand curve because the surplus due to illegal copying is greater than the surplus they previously enjoyed making legal purchases at the former equilibrium price. In this area, consumer surplus from illegal copying outweighs the consumer surplus minus the price for legal purchases. As such, those consumers no longer make legal purchases, thus falling to the lower curve entirely.

Therefore, the area between the equilibrium price of five dollars and the crossover point indicated in Figure 2 is the area most likely to contain Internet infringers—those consumers who originally would have paid for legal copies of the CD, but no longer believe it worth the price. Due to the increased price, those consumers fall off the margin and into the area of illegality. In essence, these consumers have been forced out

21. For example, Gnutella, Morpheus, or Audio Galaxy. One note on this concept before proceeding. This author is at a loss to understand why the term “sharing” still applies to what has now become little more than outright theft of copyrighted works online. Originally the term sharing was used to describe mutual publication and dissemination of educational works between academics over the early Internet. These works were generally self-authored or released with the author’s permission. Such use is easily described as sharing. Uncontrolled dissemination of copyrighted works without the creator’s permission, on the other hand, is not sharing at all—unless we could get away with saying, for example, “hey, let's go down to the corner and share a stranger's new car.” On the contrary, piracy seems the most appropriate term for this behavior.
of the legal market because the price is simply too high. They want the CD, but they do not want to pay the higher price. These are the consumers most likely to choose illegal copyright infringement via online file sharing because some demand is still present, but not at such an inflated price. The high-price-infringement cycle does not end with them, however, because subsequent purchasers face an even greater problem.

Each subsequent lawful purchaser then faces the unenviable choice: do I pay the higher price, or do I go online and obtain a pirated copy free? As the price of the lawful copy increases, due to online piracy, so does the rate of online piracy itself. The resulting high-price-infringement cycle continues until the transaction costs associated with purchasing lawful copies make lawful purchases cost prohibitive. This outcome is not inevitable, however. The cycle can and should be broken with more effective copyright protections systems.

The MediaKey™ system brings this vicious cycle to a halt and brings the cost of new media back down to manageable levels by reducing or eliminating those who fall on the illegal demand curve. With better protections and lowered costs, more purchasers should return to lawful enjoyment of copyrighted works. Perhaps just as importantly, more quality creations should flow to the public because copyright owners will bring forth more works within a system that offers effective copyright protection for their works.

D. CURRENT LEGISLATIVE SOLUTIONS

Traditional copyright laws were written to protect print media and have only recently been updated to protect against other, now low-tech, concerns such as videotape copying. The DMCA offered a leap forward by prohibiting circumvention of copyright protection systems. Section 1201(a) provides that "[n]o person shall circumvent a technological protection measure that effectively controls access to a work protected under this title." The foresight of this provision has yet to be realized under today's technology, however. Any meaningful copyright protection system of the future must incorporate measures to protect against rampant online copyright infringement. MediaKey™ is a specific technological protection measure formulated to address the problem.

Technological protection measures, properly implemented in an easy, efficient, and useable manner offer the solution required. MediaKey™ is an invisible electronic encoding system that copyright owners of the future can utilize to protect their valuable creations. It

24. MediaKey™ is invisible to consumers who neither hear nor see the MediaKey™ code in the background of an electronic work.
provides authors, artists and the like, a tool to easily publish and disseminate their copyrighted works without fear of unlicensed copying. In addition, these creators can take full advantage of the Internet to sell, lease, and license their works without losing control once their works are distributed. MediaKey™ is not a product, law, or bottle of snake oil. It is instead one possible way to implement “technological protection measures” as described in the DMCA. Making it happen will not be easy, however.

Its implementation requires contributions and cooperation among private industry, Congress, copyright owners, and the general buying public. Private industry must design and provide new hardware that takes advantage of the protection features contained within MediaKey™. Congress must pass legislative measures that require adoption of that new hardware and provide uniform standards. Copyright owners must utilize the various software packages available to encode each of their works made available to the public. And perhaps most importantly, the relevant purchasing public must adopt the system. A combination of carrot and stick will provide the relevant incentives to each of these parties. Congress will provide the stick with adoption requirements through legislation. The system itself will provide the carrot by lowering transaction costs for both copyright owners and purchasers. Once implemented, the new media will lower, in most cases drastically, the costs of copyrighted works by eliminating hidden increased costs all lawful purchasers pay to subsidize losses due to copyright infringement.

III. OTHER POTENTIAL SOLUTIONS

Many commentators propose immediate implementation of legislative measures to solve the problem of copyright infringement on the Internet. Others, especially those of Chicago School ilk, favor a purely market-driven solution. The MediaKey™ solution requires both measures in cooperative combination. Partial and intermediate solutions offer little promise of preventing future copyright infringement. A combination of private sector and federal government efforts offers the only feasible solution as described below.


26. For example, say we purchase a book that costs twenty-five dollars online. The book probably cost about five dollars to produce. The remaining twenty dollars goes, in large part, to make up for the deadweight losses due to unlawful copying. If the MediaKey™ system manages to lower these deadweight losses by only fifty percent (or ten dollars), lawful buyers could then purchase the same book for fifteen dollars. This example illustrates one of the primary benefits MediaKey™ will provide purchasers, and should ultimately help win the system widespread acceptance.
A. PURE MARKET SOLUTION

Many readers may wonder why consumers should not allow the market to take care of the problem by itself. That is a good question. Before attempting an answer, perhaps the question should be explored further. Why is it such a bad idea to simply let the market take care of the problem? If it is costly to copyright owners when they lose profits due to copyright infringement on the Internet, why not let copyright owners take care of the problem? Copyright owners can establish sales mechanisms on the Internet. Our economy appears headed from printed works to e-works, so why not let the current infringement continue until copyright owners develop mechanisms to prevent it?

The answer is straightforward—because copyright owners cannot stop Internet infringement alone. Traditional copyright laws envisioned a print media, where copies were imperfect and difficult to produce. The Internet has erased those limitations. Today, copyright owners are faced with easily made perfect copies, which are distributed to millions of users over the Internet within days. Even the best market solution cannot stop ever-escalating copyright infringement now facing copyright owners on the Internet. A combination of efforts between the private sector and federal government is now an absolute necessity.

B. PURE LEGISLATIVE SOLUTIONS

Just as with the pure market solution discussed above, pure legislative solutions cannot solve the current problem of copyright infringement on the Internet. Many copyright advocates were optimistic when the DMCA was enacted. In fact, that DMCA does provide a vital piece of the puzzle. It created penalties for circumvention of technological protection measures utilized by copyright owners to protect their copyrighted works from unauthorized access and copying.\textsuperscript{27} The DMCA by itself, however, cannot halt current copyright infringement on the Internet. Additional legislation, in cooperation with the private sector is required to solve the problem. The MediaKey\textsuperscript{TM} solution combines private sector efforts to date with future legislative requirements to produce a usable, efficient system that can and will provide the solution needed.

IV. THE BETTER SOLUTION: MEDIAKEY\textsuperscript{TM}

After reading to this point, many may ask the simple question: will MediaKey\textsuperscript{TM} work? The answer to that question is multi-faceted. But, in a nutshell, the answer is yes, it will work because its advantages vastly outweigh its disadvantages. Full implementation of MediaKey\textsuperscript{TM} will strengthen copyright protection and remove fear among copyright own-

\textsuperscript{27} 17 U.S.C. § 1201(a).
ers currently indisposed to the idea of placing their works on the Internet. MediaKey™ accomplishes its goal by both lowering transaction costs for lawful purchasers and simultaneously increasing the amount of quality media available online.

This section precisely details successful implementation of the MediaKey™ solution. It begins with an example to illustrate the benefits of MediaKey™, and then presents a layman’s explanation of MediaKey™ and technological protections measures in general. Many readers to this point may wonder how such a system could possibly achieve successful implementation. This section provides the answer to this question and more by providing a detailed roadmap for using MediaKey™.

The latter part of this section illustrates how the MediaKey™ solution relies on both private sector and legislative efforts that are already underway. Senator Hollings’ Bill in particular, provides the necessary legislative muscle to propel MediaKey™ to success. More than two-thirds of that bill’s “Findings” parallel the arguments and foundations of this paper. Moreover, MediaKey™ ultimately succeeds due to its inherent flexibility and ability to closely match consumer demand. Despite the advantages realized by MediaKey™, some fear the eventual demise of fair use. This section concludes with a response to that criticism illustrating that fair use is alive and well, before and after MediaKey™ implementation. As with any complex proposal, perhaps an example best illustrates.

A. AN EXAMPLE TO ILLUSTRATE

As mentioned above, full implementation of MediaKey™ will strengthen copyright protection and remove fear among copyright owners currently indisposed to the idea of placing their works on the Internet. MediaKey™ accomplishes this goal by both lowering costs for lawful purchasers and simultaneously increasing the amount of quality media available online.

The best illustration of this concept is embodied in a simple example of an online purchase. Referring to an earlier example, let us say that a consumer purchases a book online that costs twenty-five dollars. In addition, let us say that the book costs approximately five dollars to produce. Contrary to popular opinion, the remainder is not primarily composed of profit. The remaining twenty dollars profit actually goes, in large part, towards making up for deadweight losses due to unlawful copying and use. If the MediaKey™ system manages to lower these deadweight losses by only fifty percent (or ten dollars), lawful buyers could then purchase the same book for ten dollars less at just fifteen dollars.

The key to this scenario is the reduction in transaction costs provided by the system. Lowering transaction costs should stop the high-
price-infringement cycle. Thus, the main incentive for implementation of MediaKey™ in this example is drastically reduced costs for lawful purchasers. If properly implemented, the MediaKey™ system should exhibit this effect very quickly, something critical to widespread acceptance and its overall success.

B. MediaKey™ Defined

The concept of using technological measures to protect proprietary interests in intellectual property is not new and has been recognized or suggested in a number of federal statutes, e.g., the Communications Act, the Audio Home Recording Act, the DMCA, and the currently proposed Consumer Broadband and Digital Television Promotion Act (the “Hollings Bill”). Yet, many are completely unfamiliar with the concept and, sadly, often somewhat hostile to its implementation. Once understood, however, the benefits of its implementation become undeniably clear. A detailed definition should aid in its understanding.

The MediaKey™ system is the software portion of a combination software/hardware system designed to prevent copyright infringement of electronic media. Specifically, MediaKey™ is a form of what the DMCA calls a technological protection measure or what others call an electronic header, anti-copy measure, or anti-piracy provision. The newly introduced Consumer Broadband and Digital Television Promotion Act (originally known as the Security Systems Standards and Certification Act), refers to these measures as “Standard Security Technology.” Whatever the designation, technological protection measures, as set forth in the DMCA, are designed to allow copyright owners to control access to their works. They do so by embedding an invisible element of software code into the electronic media itself. Users do not see or hear this code, but must interact with its interface in order to access the electronic media.

Figures 3 and 4 (Appendices C and D) offer depictions of computer code utilizing the MediaKey™ system. Figure 3 depicts a visual work protected by MediaKey™. Figure 4 depicts the computer code as it runs through a computer system. In that depiction, first, computer code for the invisible MediaKey™ processes to determine whether the user has appropriate access authority. Next, the computer determines whether authority exists to display or perform the electronic media. If authority

28. See supra Part II.C.1.
29. See infra Part IV.G. (explaining how these federal statutes relate to technological protection measures).
30. See supra n. 7.
exists, the computer allows access to the electronic work. If not, MediaKey™ takes note of this fact and informs the user, while preventing further access. MediaKey™ further protects the work by being invisibly present in the background at all times. The fact that MediaKey™ is always present in the presentation of the electronic work is vitally important as discussed below.

C. Up Front Hardware Requirements

Before any of the following can occur, hardware manufacturers must incorporate the protective features of MediaKey™ into future hardware sold wherever MediaKey™ files are accessible. Realization of this goal is only achievable through legislative measures. For that reason, hardware requirements are discussed in greater depth below in the subsection entitled Implementation of The MediaKey™ Solution.32

D. How Artists and Creators Use MediaKey™

1. Creation of Traditional Media

Use of the MediaKey™ system will not hamper traditional creation of media. Because it is designed specifically for protecting electronic media, artists use the MediaKey™ once they have converted their copyrighted work into electronic format. Any type of electronic file that is transferable over a computer system, whether music, video, pictures, or text, is protectable with MediaKey™.

Once artists create a copyrightable work the next step is dissemination of that work. Before dissemination is advisable, however, the artist must protect the work by installing MediaKey™.

2. Creation of Protected Electronic Media with MediaKey™

Now that the copyrighted work is created and converted into electronic format, the next step is installing the MediaKey™. This step is essentially a file conversion.

a) Selecting Media for Conversion

For example, let us say a musical artist wants to protect a digital audio file that she creates. Digital audio files are often stored in the electronic media format known as .mp3. For this example, we will call the file NewAudio.mp3. In order to protect NewAudio.mp3 with MediaKey™, the user must run the MediaKey™ client application. If this sounds technical, just think of it as running any other application on your computer. Once the MediaKey™ client is running, the artist wish-
ing to protect her work simply selects the *NewAudio.mp3* file then selects the CONVERT TO PROTECTED FILE option within the application. The MediaKey™ client application selects the file for conversion.

**b) Encoding with MediaKey™ Passkeys**

Now that the file is selected for conversion, the user is presented with a multi-input display (similar to a spreadsheet). The user then selects and inputs the various passkeys needed for different types of uses (more on this below). A separate passkey is needed for each of the various use options, e.g., full sale, long-term license, short-term license, lease, or no-charge. An additional passkey is also needed for each of the various user options, e.g., private individual, educational, librarian, etc. If this all seems like hard work, the artist has little to fear. Because the MediaKey™ client runs on a computer system, MediaKey™ offers the additional benefit of automatically generated passkeys should the user prefer. Once the passkeys are selected, the file called *NewAudio.mp3* is ready for encoding.

**c) Generating the New File**

Once the electronic file is ready for encoding, the user selects ENCODE AND CREATE FILE option in the MediaKey™ client application. The application then creates a new file, called, for example, *NewAudio.mp4*. This new file contains the MediaKey™ protective features discussed supra and is ready for use on any MediaKey™-compliant hardware device. Again, as with generating the multitude of passkeys mentioned above, the artist should remember this important fact: the computer can generate these protected files, not only manually, but also automatically. That is an important distinction because it allows an artist to utilize the power of an Internet storefront to automatically handle every aspect of the sales transaction, including file generation with specific passkeys to match the type of license purchased by the consumer.

Once the file is created, whether manually or automatically, the artist is ready to offer the digital audio file to the ultimate user. In the new format, the artist's musical creation offers a multitude of use options as outlined below.

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33. The author anticipates that one of main uses for MediaKey™ will be within automated Internet storefronts. In such a use, the artist merely makes the digital audio file available to the integrated Internet storefront application. When customers access the artist's Web site and undertake to purchase the artist's work in electronic format, the MediaKey™ client application creates the protected file and generates a specific passkey to enable the customer's specified and agreed upon use. This custom passkey is then delivered to the customer at the time of sale along with the electronic file.
3. Distributing and Using a File Protected with MediaKey™

a) Taking Advantage of the Many Use Options

Once an artist has protected her work with MediaKey™, a multitude of use options materialize for dissemination to ultimate users. The artist can now safely distribute the electronic work by selling, leasing, licensing, or offering at no-charge. In addition, the artist can custom-tailor each sale or license for specific types of users. Because only the number of characters chosen for the passkey limits the variety of passkeys, the artist can offer purchasers virtually unlimited options for use of the artist's electronic work.

b) The Possibilities are Limitless

For example, if the artist chooses she may license the work for a sample use of one hour only. In such a scenario, the consumer downloads the file protected with MediaKey™ and a corresponding passkey designated for sample use only. When the user inputs the passkey given, the file is accessible on that device for one hour thereafter. Many will recognize this concept as the same used by software manufacturers who distribute software for trial use. Typically the software is downloaded from the manufacturer's Web site then installed on a user's computer. After a thirty-day period of use, the software is no longer accessible on that computer, and the user is faced with purchasing a license if she desires further use of the software.

Because tastes and desires vary so widely among potential customers, this inherent flexibility provides real potential for greater satisfaction among consumers. In fact, many consumers who would otherwise forego the purchase of a fifteen-dollar compact disc in order to access a single song may be enticed into purchasing one or more individual songs if such an option is available. While that concept is not an earth-shattering change, the ability to purchase the song for limited use is novel. Imagine a system where the artist can make the work available to the consumer for any specified time, e.g., one hour, four hours, one day, four days, one week, four weeks, or permanently. The possibilities are limitless and such flexibility enables an artist to offer consumers tremendous choice heretofore unimaginable.

One of the most common choices for distribution is the long-term or permanent license. This is what consumers typically receive when they purchase a CD, DVD, or VHS movie cassette. Here, MediaKey™ offers a pleasant surprise. No additional steps or complexities are involved with a long-term license than were necessary above in the one-hour sample use example. The purchaser simply pays for the specific use desired, then downloads the protected file and a custom-generated passkey that allows the long-term use purchased.
c) Copy Prevention Characteristics

By now many readers are likely wondering how MediaKey™ can stop users from simply making an audio or video copy of the decrypted work, then distributing that copy. The answer is a bit more complex than our discussion so far. The reader should refer back to Figures 3 and 4 at this point to see what occurs when users execute (i.e., play, listen to, or watch) an electronic file protected by MediaKey™. The copyrighted work embodied in an electronic file as depicted by Figure 3 is executed when the consumer plays or views the work on a MediaKey™-compliant hardware device. At that point, the hardware device reads both the file for the electronic work and the otherwise invisible MediaKey™ file. Understanding that concept is key to understanding how MediaKey™ works.

Any electronic file protected by MediaKey™ always contains the MediaKey™ file, regardless of copying. Because the invisible MediaKey™ is always in the background, it gets copied right along with the copyrighted work when played, viewed, or otherwise executed by the consumer. Thus, any consumer who chooses to copy that work on a standard (non-MediaKey™-compliant hardware device) audio or video system might initially believe that she has made a functional copy. The rude surprise comes when she attempts to execute that file again on any MediaKey™-compliant hardware device. Because the MediaKey™ is still in the background, the hardware device immediately recognizes two things. First, that the file is protected by MediaKey™ so it will not play without a passkey. Second, because MediaKey™-compliant hardware devices are intelligent devices, the hardware immediately recognizes that the file is a copy. Since the file is a copy, the hardware device asks, not for the original passkey, but for a copy passkey, which the user does not possess. The result: functional copies are not possible without the copyright owner’s permission.

d) Protecting Fair Use in View of MediaKey™ Copy Prevention Features

After reading the paragraph above, most fair use advocates are probably cringing at the thought. Such anxiety is unnecessary. Legislation implementing technological protection measures should require any copyright owner using MediaKey™, to maintain a Web site for consumers. Any consumer wishing to make or obtain a legal copy for their own use, educational uses, etc. can access the Web site and obtain copy passkeys, extra passkeys, or even duplicate files. It is important to note, however, that while the Web site would allow eventual success, the process should not be easy. An effective copyright protection scheme needs to maintain
current fair use privileges without simply providing one more loophole for pirates to engage in multiple copying.

Towit, although current laws allow consumers to make additional copies for their personal use, those laws do not require copyright owners to make that process easy. The ability to make legal copies for personal use must be balanced against the need to prevent copyright pirates from making multiple illegal copies. As such, a multi-stage and somewhat cumbersome process—much like current online purchasers must undertake to purchase anything on the Internet today—should suffice to provide legal purchasers the ability to make additional copies of any work they purchase. At the same time, the additional transaction costs associated with such a multi-stage, cumbersome process should prevent multiple-copy piracy. No doubt fair use advocates remain concerned about copies for traditional educational uses as well.

e) Protecting Fair Use by Providing Multiple Options for Multiple Types of Users

Fair use advocates may also wonder how traditional users protected under the fair use doctrine will fare after MediaKey™ implementation. Again, any anxiety on the issue is misplaced. The same flexibility that allows the artist to tailor specific sales and licenses for differing use demands, allows the artist to offer special licenses to librarians, teachers, students, as well as charitable organizations. The same Internet storefront that provides consumers access to the artist's work will incorporate additional input fields to allow these individuals and institutions special access licenses to facilitate those same methods of use traditionally afforded. Use tailored to demand allows copyright owners to protect those users traditionally afforded more leeway under the fair use doctrine, and provides other benefits an economist might appreciate.

4. Price Discrimination with MediaKey™—An Economist's Perspective

As illustrated above, one of the primary benefits of MediaKey™ is its potentially limitless variety of uses. Both the artist and consumer are free to bargain for whatever type of use is desired. This potential for tailor-made sales and licensing offers the added advantage of what economists refer to as price discrimination. As demonstrated in the examples supra, price discrimination allows producers of creative works to offer exactly the amount of use desired by consumers. In this way, the consumer never gets more or less than she needs, and producers are never forced to sell more or less than consumers want. Such accurate price discrimination is one of the primary advantages of the MediaKey™ sys-

34. Id.
tem. Resultant efficiencies offer the potential for drastically decreased costs by reducing deadweight losses described, for example, in the transactions above.

Now that the reader is familiar with the premise of MediaKey™ and its use, a more detailed explanation is required to demonstrate how such a system is successfully implemented. This process involves cooperation and specific mandates between the private sector and the federal government.

E. Implementation of the MediaKey™ Solution

1. Private Sector Efforts

As detailed earlier in the paper, the MediaKey™ system cannot succeed without cooperation among hardware manufacturers and the federal government. Any meaningful copyright protection scheme can only occur within the framework of common industry standards and rules. This concept is perhaps best demonstrated by a simple analogy. Copyright protection is like a shiny new boat that, nonetheless, has thousands of holes. The boat is only useful if each one of the holes is plugged. A single leak will sink the boat regardless of all the hard work that went into maintaining the other plugs. So too will MediaKey™ and any other copyright protection schemes fail unless ALL hardware manufacturers are required to produce future hardware with integrated technological protection measures. Hence, the only reasonable means of accomplishing this goal is through legislative requirements.

2. Legislative Efforts

The MediaKey™ system simply cannot succeed without legislatively mandated standards and rules. The potential for cheating would quickly cause any anti-piracy system to fail without legal requirements for uniform implementation. Many hardware manufacturers are otherwise

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35. See James Long, Speech, Digital Online Content: Creating a Market That Works (Wash., D.C., Apr. 18, 2002) (copy of transcript on file with the author). There has be some agreement between hardware manufacturers and copyright owners before we can really proceed with new and useful standards. The copyright industry will not continue to flourish as it has in the past unless common approaches between providers and manufacturers are developed to head them both in the same direction. This is amazingly hard to accomplish without clear rights and rules to approach common methods. I worry that the house is on fire and it will burn down while we negotiate. Id.

36. Id.; see also Sean Ryan, Speech, Digital Online Content: Creating a Market That Works (Wash., D.C., Apr. 18, 2002) (copy of transcript on file with the author). "A free market won't fix the problem. Online file sharing will not stop until Congress implements legislation to stop piracy. When we get to a place where no one is happy, maybe we're finally there." See also Mark Mooradian, Speech, Digital Online Content: Creating a Market That Works (Wash., D.C., Apr. 18, 2002) (copy of transcript on file with the author).
likely to produce devices that circumvent copyrighted works or perform copyrighted works with the technological protection measures disabled or ignored. Copyright owners may succeed in developing a near-perfect infringement-prevention system, but without legislative backing to force the industry as a whole to comply, such a system is doomed. The standards developed must be legally enforced in order to succeed. Legislation, therefore, is a vital component within the MediaKey™ implementation scheme.\textsuperscript{37}

a) The Hollings Bill

Apparently Congress has gotten the message and agreed with this premise. Senator Hollings, along with Senators Stevens, Inouye, Breaux, Nelson, and Feinstein, introduced the \textit{Consumer Broadband and Digital Television Promotion Act} before the Senate on March 21, 2002.\textsuperscript{38} This bill, if enacted, requires implementation of copyright protection systems such as MediaKey™. It mandates that the private sector work with the Federal Communications Commission ("FCC") and the Copyright Office to develop and implement meaningful "security system standards" within one year of enactment.\textsuperscript{39} The bill recommends consultation between the FCC, Register of Copyrights, and the private sector. Whether or not the private sector chooses to work with the FCC, the FCC is required to initiate a rulemaking "to adopt those standards and encoding rules" finally agreed upon. In other words, Congress has already begun the legislative component required to implement MediaKey™.

Because the \textit{Consumer Broadband and Digital Television Promotion Act} is so vital to implementation of MediaKey™, many of its more relevant sections are set forth below. Perhaps the best evidence of the need for MediaKey™ is found in Section 2 of the bill entitled "Findings." This section states, in relevant part, that:

\begin{quote}
The Congress finds the following: . . .

(2) Owners of digital programming and content are increasingly reluctant to transmit their products unless digital media devices incorporate technologies that recognize and respond to content security measures designed to prevent theft.
\end{quote}

\footnote{Those who originally fought legislation to stop copyright infringement are now singing a different tune. Now that CD sales are actually falling for the first time ever, many are reconsidering their views." \textit{Id.}}

\textsuperscript{37} When this paper was begun in Jan. 2002, it was evident to the author that the MediaKey™ system could not succeed without legislative backing. Two months later, the Hollings Bill was introduced before the Senate. If enacted, it would accomplish precisely those goals set forth in this paper. As such, the remainder of this section will detail the relevant portions of that bill rather than present additional legislative proposals.

\textsuperscript{38} \textit{See Hollings Bill, supra} n. 31 (noting that the bill was introduced on March 21, 2002).

\textsuperscript{39} \textit{Id.} at § 3.
(3) Because digital content can be copied quickly, easily, and without degradation, digital programmers and content owners face an exponentially increasing piracy threat in a digital age.

(4) Current agreements reached in the marketplace to include security technologies in certain digital media devices fail to provide a secure digital environment because those agreements do not prevent the continued use and manufacture of digital media devices that fail to incorporate such security technologies. . . .

(6) Technological solutions can be developed to protect digital content on digital broadcast television and over the Internet.

(7) Competing business interests have frustrated agreement on the deployment of existing technology in digital media devices to protect digital content on the Internet or on digital broadcast television.

(8) The secure protection of digital content is a necessary precondition to the dissemination, and online availability, of high quality digital content, which will benefit consumers and lead to the rapid growth of broadband networks. . . .

(16) Unprotected digital content on the Internet is subject to significant piracy, through illegal file sharing, downloading, and redistribution over the Internet.

(17) Millions of Americans are currently downloading television programs, movies, and music on the Internet and by using 'file-sharing' technology. Much of this activity is illegal, but demonstrates consumers' desire to access digital content.

(18) This piracy poses a substantial economic threat to America's content industries.

(19) A solution to this problem is technologically feasible but will require government action, including a mandate to ensure its swift and ubiquitous adoption . . . .

The bill continues in Section 3 with a requirement for rulemaking, which puts the burden on the FCC to make a determination when agreement on security system standards has been reached then “adopt those standards and encoding rules” to “provide effective security for copyrighted works.” As mentioned earlier, the system adopted must be simple, functional, and useable so that the benefits of using it outweigh the costs of business as usual. Section 3 recognizes these vitally important attributes by stating that:

“. . . the security system standards [chosen] shall ensure, to the extent practicable, that (1) the standard security technologies [promulgated] are (A) reliable; (B) renewable; (C) resistant to attack; (D) readily implemented; (E) modular; (F) applicable to multiple technology platforms;
(G) extensible; (H) upgradable; [and] (I) not cost prohibitive . . . .

Because it recognizes these important provisions and provides the legal muscle necessary to make technological protective measures a success, this bill should provide the legal means required to make MediaKey™ a success.

b) Music Online Competition Act

A somewhat less effective effort is underway on the House side. On August 3, 2001, Congressmen Cannon and Boucher introduced the Music Online Competition Act ("MOCA"). MOCA's most significant provision requires holders of sound recording copyrights to license independent Internet music distributors on terms that are no less favorable than those on which they license affiliated distributors. In reality, this amounts to little more than a compulsory licensing scheme and does virtually nothing to stop copyright infringement on the Internet.

Even worse, this bill actually conflicts with the Hollings Bill by prohibiting copyright owners from using technological protection measures. A careful reading of the bill demonstrates that it provides a great deal of protection for independent online music providers and does virtually nothing to protect copyright owners from infringement. This bill, if enacted, would make it illegal for a copyright owner to bargain directly with consumers, after market providers, re-sellers, etc. unless the copyright owner provides identical terms to each of those individuals and entities. All flexibility to tailor the transaction to individual consumer choice would evaporate. Not only would this have the effect of removing inherent flexibility intended by MediaKey™ and the Hollings Bill, it would also amount to forced licensing that would further erode those rights currently held by artists and creators.

The Hollings Bill contrasted with MOCA illustrates a vital principle. Those legislative efforts required for implementation of any meaningful copyright protection scheme, must focus on two primary targets: copyright owners and consumers. Middlemen such as MusicNet, Listen.com, and pressplay may need protection, but the interests of copyright owners

43. Id. (Adoption of Security System Standards and Encoding Rules).
44. See id. at § 7 (Enforcement).
47. H.R. 2724, 107th Cong, at § 4(b)(2)(A) (prohibiting the use of "particular digital right management technology").
and the public should take precedence. Legislative efforts should focus on measures that have the effect of reducing or eliminating copyright infringement, not protecting special interest groups and intermediaries. Only a solid solution such as MediaKey™ (embodied in the Hollings Bill) will solve the problem and stop the bleeding. Despite the apparent truth of this statement, there are those who take issue with MediaKey™.

F. CRITICISMS OF MEDIAKEY™

The primary criticism of MediaKey™ is likely to arise from fair use advocates. Some believe that implementation of technological protection measures will inevitably lead to the demise of fair use.48 These fears are alarmist at best.49 Nothing in current or proposed future laws, whether the DMCA or Senator Hollings' Consumer Broadband and Digital Television Promotion Act, suggest changing or scaling back fair use. On the contrary, the DMCA and Senator Hollings' proposal are both intended to achieve precisely the opposite outcome, while promoting the creation of more copyrighted works.

Prior to the DMCA, Congress did not find it necessary to specifically address fair use in the context of prohibitions in support of technological protection measures. Yet, when the opportunity arose and the DMCA was enacted, Congress demonstrated that development and use of technological measures could be implemented without adversely affecting fair use if the legislation is properly crafted.

Moreover, fair use does not automatically give anyone a right to have access to a copyrighted work. Nor does it create any obligation on the part of a copyright holder to make it easier for lawful purchasers to reproduce or distribute legally acquired copyrighted works. Fair use is more properly understood as a limited privilege to engage in certain otherwise infringing conduct without the permission of the copyright holder. Viewed in this proper light, fair use is not compromised by the use of technological protection measures.

G. A RESPONSE TO THE CRITICISM

The concept of using technological protection measures to protect intellectual property is not new and, in fact, has clear precedents in federal

48. 17 U.S.C. § 107. Fair use is a common law principle of equity subsequently codified in Section 107 of the Copyright Act. Id.

49. Remember, "our age of anxiety is, in great part, the result of trying to do today's jobs with yesterday's tools." Marshall McLuhan, Quote Nook <http://www.xcity.20m.com/quotes.htm#technology> (last visited Feb. 28, 2002). Traditional notions of fair use best apply to traditional forms of copyrighted works. The days of paper print are fast coming to a close. It is now time to take action before online infringement brings the industry to its knees. If traditional copyright were a house on fire, it almost seems as though some fair use advocates would rather let it burn down than take a chance to stop it.
law. For example, the *Communications Act*\(^{50}\) discusses the use of such measures in its prohibition against unauthorized reception of cable TV and satellite broadcasting signals. Similar to the DMCA, in addition to prohibiting the theft of broadcast signals, this statute also prohibited trafficking in devices designed to facilitate theft of those signals. In addition, the *Audio Home Recording Act*\(^{51}\) prohibits circumvention of certain technological safeguards related to digital audio recordings, as well as creation and use of devices that facilitate circumvention.

The anti-circumvention provisions of the DMCA are consistent with these recent federal statutes and do not impose unduly burdensome restrictions on fair use. Although many have criticized the DMCA as the statutory equivalent of a ban on fair use, Congress did not go so far. In fact, Congress built safeguards and review procedures into the DMCA as enacted to prevent such dire predictions from realization.\(^{52}\) With fair use safely ensconced in its traditional space, the spotlight needs now to focus on prevention of rampant copyright infringement.

MediaKey\(^{TM}\) is specifically designed as a forward-looking system to implement technological protection measures set forth in the DMCA.\(^{53}\) It will not bring about the end of humanity, nor will it destroy fair use. It will, however, benefit copyright owners and consumers by assisting in the placement of more copyrighted works on the Internet and by removing the current and future plague of unrestrained copying. Once

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\(^{50}\) 47 U.S.C. §§ 553(a)(1)-(2), 605(a)&(e)(4) (1994).


\(^{52}\) See e.g. *Consumer Broadband and Digital Television Promotion Act*, Sen. 2048, 107th Cong. § 2 (2002). Findings 20-23 of the bill state:

(20) Providing a secure, protected environment for digital content should be accompanied by a preservation of legitimate consumer expectations regarding [fair] use of digital content in the home.

(21) Secure technological protections should enable content owners to disseminate digital content over the Internet without frustrating consumers' legitimate [fair] use expectations to use that content in a legal manner.

(22) Technologies used to protect digital content should facilitate legitimate home use of digital content.

(23) Technologies used to protect digital content should facilitate individuals' ability to engage in legitimate [fair] use of digital content for educational or research purposes.

Section 3 of the same bill states:

(e) Encoding Rules-

(2) PERSONAL USE COPIES- No person may apply a security measure that uses a standard security technology to prevent a lawful recipient from making a personal copy for lawful use in the home of programming at the time it is lawfully performed, on an over-the-air broadcast, premium or non-premium cable channel, or premium or non-premium satellite channel, by a television broadcast station (as defined in section 122(j)(5)(A) of title 17, United States Code), a cable system (as defined in section 111(f) of such title), or a satellite carrier (as defined in section 119(d)(6) of such title).

*Id.* at § 3.

MediaKey™ is implemented, copyright owners will begin offering their works on the Internet for sale, lease, rent, or free knowing that consumers no longer have the ability to instantly copy and distribute to millions of other Internet consumers. More importantly, something that the fair use advocates often fail to realize is that consumers will benefit from MediaKey™ in far more ways than copyright owners.

First, consumers will enjoy far greater varieties of copyrighted works available online. Second, consumers should pay far less for these works because of the ease of distribution offered by the Internet, and because of diminished deadweight losses due to lower levels of copyright infringement. Finally, as has happened with virtually every new technology generated in the past, additional markets, heretofore unimagined, will develop and ultimately benefit both consumers and creators. But what about current copyright infringement you ask?

MediaKey™ is a forward-thinking proposal. For those who point to the fact that this proposal does nothing to stop current copyright infringement, this author responds with the following simple analogy: crying over spilled milk does nothing, but being more careful with the next glass certainly helps. In the case of online copyright infringement, the proverbial milk is on the floor and no amount of crying will get it back into the glass. Properly implemented, MediaKey™ offers a common sense solution to keep the next glass off the floor.

V. CONCLUSION

The DMCA's technological protection measures offer copyright owners and consumers both a robust yet simple system to end the current rampage of copyright infringement on the Internet. MediaKey™ implements these measures in a simple, functional, and useable manner so that the benefits of using it outweigh the costs of business as usual. Other ideas abound, but no other provides a realistic and workable solution.

MediaKey™ combines the best of private sector and governmental efforts to accomplish a goal heretofore impossible. Simply put, MediaKey™ offers the best and only, thus far, complete solution to end the current plague of online copyright piracy and stop the bleeding.
APPENDIX A

Consumer Surplus = \(0.5 \times 1000 \times 10 = 5000\)
APPENDIX B

Demand Curve Illustrating Reduction of Consumer Surplus for Legal Purchasers and Crossover Point to Infringement
APPENDIX C

Copyrighted Work in Electronic Format