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Digital Rights Management:

A failure in the developed world, a danger to the developing world

For the International Telecommunications Union, ITU-R Working Party 6M Report on Content Protection Technologies

Presented by :

Electronic Frontier Foundation (www.eff.org)
Union for the Public Domain (www.public-domain.org)
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IP Justice (www.ipjustice.org)
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Electronic Frontier Finland (www.effi.org)
Foundation for Information Policy Research (www.fipr.org)
Free Government Information (freegovinfo.info)
Vereniging Open Source Nederland (www.vosn.nl)

Contact:

Cory Doctorow
European Affairs Coordinator
Electronic Fontier Foundation
Unit 306
456-458 Strand
London UK
WC2R 0DZ
cory@eff.org
+44.798.607.2869

Executive Summary:

This paper discusses the failure of DRM in the developed world, where it has been in wide deployment for a decade with no benefit to artists and with substantial cost to the public and to due process, free speech and other civil society fundamentals.

Development and IP

- IP regimes vary from nation to nation and reflect national development priorities
- A given nation's limitations and exceptions to copyright are a powerful means of boosting local industry and fostering domestic entrepreneurs
- DRM can be used to overrule these priorities, so that foreign companies can trump local domestic policy with technological means
- DRM systems make rich-country assumptions about family and domestic life that are inappropriate to many developing countries

DRM in the developed world

- DRM systems can't protect themselves, they require "anti-circumvention" laws to silence researchers who discover their flaws
- Anti-circumvention laws have been used to silence and even jail researchers who embarrassed entertainment companies and DRM vendors with revelations about the failings in their systems
- Some nations have a trade obligation to implement anti-circumvention laws, but this obligation is less strict than many national implementations in law
- The safest course of action for government is to reject DRM in its own documents and in documents produced by contractors

Consumer interests

- DRM systems retard innovation, putting new features under the veto of incumbent industries who fear being out-competed by new market entrants
- "Renewable" DRM can be used to cheat consumers by removing or altering features after they have bought their devices
- Disabled people
- Copyright law often affords rights to disabled people that trump the rights of authors
- DRM lets private rightsholders unilaterally prevent the exercise of those rights
- The ability of disabled people to benefit from digital media is badly undermined by DRM

Libraries

- The success of the information society depends on digital content being accessible. Digital content must not locked up behind technical barriers.
- Libraries must not be prevented by DRM from availing themselves of their lawful rights under national copyright law and must be able to extend their services to the

digital environment.

- Long term preservation and archiving, essential to preserving cultural identities, maintaining diversity of peoples, languages and cultures and in shaping the future, must not be jeopardized by DRM.

DRM in the developing world

- DRM systems overrule local copyright limitations
- DRM systems often assume infrastructure that isn't present in the developing world

Local authors and performers

- DRM systems require that their users take a restrictive license from a cartel, often at a high cost
- These licenses have the effect of turning publishers, performers and author into customers for developed-world intermediaries to whom they become beholden

Resale of goods

- Developing nations have a widespread reliance on low-cost used goods
- DRM systems are used to prevent the re-sale, lending and donation of information goods

Public Domain

- Many works are out of copyright or were not copyrightable to begin with
- These works are a potential free library for developing world educators, researchers and development workers
- DRM can be used by companies to assert ownership of these public goods

Free and Open Source Software

- Free and open source software is critical to current and future development efforts as it provides a hedge against anticompetitive behavior, and is readily localized into local languages
- DRM technologies cannot be embodied in FOSS and so any field where DRM is adopted crowds out FOSS and eliminates the development benefits therein

Region coding

- Windowing and region coding are used to discriminate against poor countries by offering them information goods only after they have exhausted their commercial potential in rich countries

Distance education

- Distance education is a key means of providing access to education in the developing world
- DRM undermines distance education by raising the cost of providing instructional materials and by placing barriers to storing, transmitting and using distance

education materials.

DRM can't benefit local cultural production

- DRM can't "keep honest users honest" -- users are either honest or they aren't
- Adopting DRM locks your industries and your citizens into a DRM vendor for all time

DRM has been a total failure at keeping works offline

- For DRM to work, it must succeed in keeping materials off of the Internet
- But no piece of DRM-restricted media has ever succeeding at doing this

Successful local culture providers are turning to copyleft

- Rich countries are developing ambitious programs to put the "crown jewels" of their culture online without DRM and without legal restriction
- If you adopt DRM, your local culture will be crowded out by this freer, more open culture

Policy-makers around the world have to juggle many priorities: industry, public interest, cultural preservation, education, and so forth. DRM has been positioned by its adherents as a system for accomplishing many of these goals with little cost. In fact, the reverse it true: DRM exacts a terrible cost to the public, to performers and authors, to educators and cultural institution, and it delivers nothing in return. DRM is a system for delivering less freedom to performers and authors and the public while charging more. It is all cost, no dividend.

Introduction

This paper discusses the failure of DRM in the developed world, where it has been in wide deployment for a decade with no benefit to artists and with substantial cost to the public and to due process, free speech and other civil society fundamentals.

This paper also discusses the special risks to the developing world posed by DRM through restrictions on liberty, distance education, development efforts, criticism, and the creation and dissemination of culture.

DRM delivers no public value but exacts a punishing public cost. It is so harmful to the interests of developed countries that there are widespread revolts against DRM underway in the US and Canada, in Europe and in Asia.

As you will see, the answer to "Which DRM will spur the most development in my nation?" is "None at all."

Development and IP

In October, 2004, the World Intellectual Property Organization (WIPO) adopted a landmark proposal put forward by Brazil and Argentina, calling for the development of a WIPO "Development Agenda."[1] The Development Agenda recognizes that different countries need different, locally appropriate IP regimes to stimulate their development.

In particular, the Development Agenda seeks to give the developing world its own IP rules that are appropriate to those countries' domestic priorities and economic development. This is an historically proven way to bootstrap development in struggling nations. The United States spent its first century as a "pirate state" where foreign authors received no copyright privileges -- it wasn't until the US had nurtured its home-grown copyright industry to the point that it had become a net exporter of works that it entered into limited bilateral copyright agreements with foreign nations. The U.S. did not accede to the Berne Convention on Literary and Artistic Works, the cornerstone treaty of the international copyright regime, until 1989, over a hundred years after its inception.

The need for copyright laws that appropriately reflect developing countries' economic status was tacitly acknowledged in the Berne Convention Appendix[2], which grants developing nations certain exceptions and limitations to foreign copyright, including the right, under some circumstances to produce and publish translations of foreign works.

The objective of a rational copyright policy is to encourage creativity and culture, as well as access to works. In achieving these objectives, copyright regulators must balance costs and benefits of various incentive mechanisms, including laws that restrict copying without permissions or remuneration.

A rational copyright policy does not seek to merely add more exclusive rights, then -- rather, it seeks to add *just enough* exclusive right so as to maximize the incentive to create *and no more*.

For example, since 1996, the EU has granted sui generis protection for component data to those who invest in the gathering of information into "non-original databases" (e.g., a list of all the colors with their names and corresponding light wavelengths); America has rejected copyright coverage for facts and data within a database. In the USA, the database industry has grown twenty-fivefold since 1979, while in Europe, databases growth has stagnated to pre-1996 levels[3]. America is home to the largest databases in the world. From this long-running experiment, it is clear that if your goal is to maximize the creation of databases, your best course of action is to adopt the American, and not the European approach. In this case, more rights means less development.

The crux of the Development Agenda is that all new copyright instruments must be viewed

through the lens of how they benefit the developing world. It is not enough to simply ratchet up the restrictions on copying or sharing works.

Developing nations must choose what to protect and how to best protect it. A nation with a strong domestic music industry may also be one that is importing other copyright works, including technical journals, education materials or software. A country seeking to develop a domestic software industry may decide that it will do better by supporting free/open source software business models, rather that protect foreign proprietary software monopolies.

The first danger from DRM then is that technological measures used to restrict a work can override national development priorities as expressed in local copyright laws. If your nation grants a sweeping exemption to copyright for works used to teach in rural schoolhouses, it will avail you naught in the face of DRM locks placed on works that admit of no such exemption. If your copyright allows rural broadcasters to retransmit works in the national interest on payment to a collecting society, that domestic policy will not be able to stand up in the face of DRM.

Summary:

- IP regimes vary from nation to nation and reflect national development priorities
- A given nation's limitations and exceptions to copyright are a powerful means of boosting local industry and fostering domestic entrepreneurs
- DRM can be used to overrule these priorities, so that foreign companies can trump local domestic policy with technological means

DRM in the developed world

DRM has presented great dangers to the stability and progress of the developed world, where it has been a source of a string of embarrassing spectacles in which legitimate research, science and culture have been jeopardized by laws intended to prop up DRM. The public's relationship with DRM has been even more contentious, with widespread consumer revolt against DRM systems.

Anticircumvention Laws

DRM is unlike other, legitimate security technologies, like those used to protect electronic commerce or financial records. In the latter cases, breaking into one transaction does not spoil the entire system (e.g., a malefactor who intercepts a single credit-card number in transit does not receive all credit-card numbers for his trouble), while the opposite is true with DRM: a technology to remove the DRM from DVDs compromises the restrictions on every DVD sold up to that moment.

In order to protect DRM, governments around the world have enacted "anticircumvention" legal regimes that ban the sale, manufacture and dissemination of tools that can be used to break DRM locks. Unlike real security systems, such as those used to keep encrypted email and Web-sessions private, DRM systems are not "self-protecting." Without state sanctions on those who publish their workings, DRM systems are useless.

Real security systems, however, rely on just this sort of disclosure. Legendary security expert Bruce Schneier[4] explains, "Anyone can design a security system that is so secure that he can't imagine any way of breaking it." The only experimental methodology for establishing the sufficiency of a security technology is to disseminate its workings as widely as possible, so that many minds can examine it for flaws that can be corrected. In the field of security research, this method is the only one considered credible. A security system whose workings are not public is not considered fit for use. Even the US military and intelligence agencies rely on public ciphers such as AES to secure their data.

Anti-circumvention laws short-circuit this system of peer-review, leaving many security researchers in jeopardy of civil and even criminal penalties for disclosing their critiques of DRM systems.

There have been several infamous instances of this in the developed world. Edward Felten, a distinguished Princeton engineer, led a team that researched the music industry's proposed Secure Digital Music Initiative (SDMI) audio watermark technology. They made short work of the SDMI system, finding it to be fatally flawed and trivially broken. Rather than suffer the embarrassment of having their crown jewels revealed for paste-gems, the music industry took advantage of the US anti-circumvention laws to bring legal threats

against Felten and his team. They also threatened the academic conference where he was to reveal his findings, advising the conference organizers that they would be treated as accomplices to the act of circumvention if they allowed Felten and his team to discuss the mathematical basis for their investigation. It was the view of the record industry that anti-circumvention outlawed certain engineering principles.

Professor Felten and his team eventually prevailed, after their case was taken up by the Electronic Frontier Foundation (EFF), but others were not so fortunate.

Dmitry Sklyarov is a Russian scientist who attended a computer security conference in Las Vegas in 2001 to present his findings on the inadequacies in Adobe's electronic book ("ebook") restriction scheme. Adobe's system had made several classic security mistakes and was, literally, a case-study in how not to design a security system. Humiliated before the technology world, Adobe had the FBI arrest Sklyarov and hold him in prison for several weeks, and then kept him embroiled in a court proceeding that separated him from his wife and infant daughter for five months. As a result, the Russian government issued an advisory to its scientists to exercise caution in visiting the United States, as it had become a country where certain industries could use anti-circumvention laws to have their critics imprisoned.

In Norway, the scene played out again, when a teenager named Jon Johansen and his friends produced a computer program called DeCSS that was necessary in order for them to watch out-of-region DVDs and to play back DVDs under the GNU/Linux operating system[5].

American entertainment companies pounced on the boy. They pressured Norwegian authorities to bring him up on criminal charges at home. Although Norwegian courts refused to convict him, Johansen spent half a decade fighting the charges which dominated the remainder of his boyhood. Again, crucial to this story was the insecurity of the entertainment companies' Content Scramble System (CSS) on DVDs and the humiliation suffered by the entertainment companies and their technology providers after its defeat by a 15 year old who then attempted to prop up their technology by using anti-circumvention laws against redistributors of the computer program in the U.S., after it had become freely available on the Internet

It is likely that most developing nations will be forced to adopt anti-circumvention laws in the future -- either because they have acceded to the World Intellectual Property Organization's 1996 Copyright Treaty (WCT) or Performances and Phonograms Treaty (WPPT), or through bilateral, regional or hemispherical free trade agreements.[6]

Countries that have signed onto various bilateral and regional trade agreements with the US are obligated to implement their own anti-circumvention laws. However, unlike the WCT and WPPT, which allow countries more flexibility in implementing anti-

circumvention laws consistent with their national copyright exceptions, the recent free trade agreements require far broader anti-circumvention laws that mirror the U.S.'s Digital Millennium Copyright Act. In that lurks the danger that foreign and domestic DRM-using companies will be able to chill academic research, punish home-grown innovators and entrepreneurs, and cover their misdeeds with the assistance of the public's tax-funded courts and police system.

Any government that avails itself of a DRM system compounds this risk by legitimizing and popularizing DRM among its systems. Governments should never employ DRM systems, and should require that all contractors who produce material for official use eschew the use of DRM systems to minimize the risk that trade-mandated anti-circumvention laws will be brought to bear against local researchers and entrepreneurs.

Summary:

- DRM systems can't protect themselves, they require "anti-circumvention" laws to silence researchers who discover their flaws
- Anti-circumvention laws have been used to silence and even jail researchers who embarrassed entertainment companies and DRM vendors with revelations about the failings in their systems
- Some nations have a trade obligation to implement anti-circumvention laws, but this obligation is less strict than many national implementations in law
- The safest course of action for government is to reject DRM in its own documents and in documents produced by contractors

Consumer interests

As bad as DRM has been for industry and academe in the developed world, it has exacted a heavier toll on consumers. DRM has cost consumers progress in their devices, has been used to claw back features that were present in their devices when they bought them, and to lock them out of legitimate new functionality brought to them by aftermarket third-party vendors.

Nowhere is this more glaring than with DVD players. These devices have been in the market for more than ten years now. Any company that wishes to make a DVD player must first contract with a shadowy cartel called the DVD Copy Control Association (DVD-CCA), whose policies and procedures are secret. The DVD-CCA licenses out the cryptographic keys necessary to play back a DVD without availing oneself of circumvention tools such as Jon Johansen's DeCSS.

The DVD-CCA requires its licensees to implement a wide range of restrictions to their devices, including a requirement that these devices honor "region codes" that prevent their owners from watching DVDs bought abroad (for example, a Filipina who is working in the USA can't use a local DVD player to watch the movies her family sends her from

home). Additionally, the DVD-CCA requires that all output and recording features for DVD players be approved by the cartel.

In ten years the cartel has never approved a new way of recording or outputting DVD movies, save for those systems that are controlled by licensing bodies run by the same member companies as the DVD-CCA. In other words, the DVD-CCA reserves the exclusive right to innovate in key DVD features.

Contrast this with CDs, which do not have a licensing regime that restricts the feature set of CD players. In the time since DVD players were introduced, CDs have seen a slew of new uses that increase the value of consumers' CD collections. Examples of these new uses include converting songs to ring-tones for mobile phones, filtering out vocal tracks on CDs for use in karaoke sessions, converting CDs to MP3s and playing them back on computers and portable players like Apple's iPod, and many other commonplace uses. Recordable CDs can be used to store ten times as much music as old-style CD-Audio discs, in compressed MP3 format. Each of these is a return on the public's investment in the CD format.

DVDs have paid no such dividends. DVD owners can't build DVD libraries on their PCs, nor back up their DVDs to blank discs, nor combine them with home movies to amuse their children and relatives. Indeed, consumers who invest in large DVD libraries and move abroad discover that due to region-coding, their investment is worthless: an American DVD collection brought to the UK can't be played back on British DVD players.

The blame for this decade of stagnation can be squarely laid at the feet of the DRM in DVDs and the consequent need to license DVD playback technology from an anti-innovation cartel of entrenched companies.

Modern DRMs are exacting an even heavier toll. New "renewable" DRM systems can be used to take away features that consumers paid for when they bought their devices, and even to undo consumers' efforts to install after-market improvements to their own technology.

For example, Microsoft's Media Center PC was sold with the promise that it could be used to record television programs to its hard drive and subsequently "burn" (record) them to DVDs, enabling consumers to build libraries of their favorite shows.

One such consumer bought a Media Center PC so that he could build a library of the popular HBO show The Sopranos[7]. When he bought his Media Center PC for thousands of dollars, he was delighted with how well his new tool worked: every week he recorded the Sopranos and saved his recording off to disc.

Then, one week, without warning, HBO triggered a flag in its DRM that told Microsoft's

Media Center software to disallow burning of the Sopranos. This was months after he made his purchase -- too late for him to return his goods. Without warning or appeal, he lost the feature he bought his device for, too late for him to change his mind. Under normal circumstances, this kind of behavior would be prohibited under consumer protection rules, but because DRM was the mechanism used to accomplish this, there was nothing he could do.

Millions of American consumers have installed set-top "personal video recorders" (PVRs) provided by their cable companies. These boxes provide the capability for consumers to record and archive their favorite shows to an internal hard-disk drive for later viewing.

However, these PVRs hold lurking dangers for the consumers who bought them. Using DRM technologies, these systems allow cablecasters such as HBO to disable or curtail a consumer's ability to record or save a given show. For example. HBO recently announced that it would disable the long-term archiving of the show "Six Feet Under,"[8] expiring saved shows off the device after two to four weeks. The network's stated reason for this is its desire to sell viewers a boxed set of DVDs once the season has run out and its fear that some sales will be lost if viewers are allowed to make their own collections. The plan therefore is to use DRM to see to it that consumers get less than they did in the pre-DRM world, where making such a collection was a simple matter.

Renewability's most insidious danger to consumers is that it can be used to remove features from devices outright on an "all-content" basis. Apple's iPod and iTunes Music Store (iTMS) exemplify this risk: Apple customers who bought music from the iTMS up until April 2004 were told that their music playlists could be burned on up to 10 CDs. After that April, however, Apple pushed out an "update" to iTunes that reduced this maximum to seven.

Likewise, owners of iTunes music who bought after iTunes 4.0 came out acquired music that could be played from one computer to another via the Internet, enabling, for example, a worker to listen to the music on her home music-server while at the office. When the 4.0.1 "update" to iTunes came out, this disappeared and was replaced with a system that only allowed for "local" sharing between users on the same network. Some users chose not to run Apple's update, but discovered that in order to upgrade their operating systems to version 10.3 and reap the benefits of increased stability and functionality for applications totally unrelated to music that they also had to install the updated iTunes and lose the ability to share music over the Internet.

More recently, Apple updated iTunes in a way that deliberately broke a program called "iPod Download," which allowed iPod owners to move their music from their iPods to their PCs. Apple included iPod Download in a blacklist of programs that iTunes would not communicate with. At the same time, Apple released an iPod update that broke software provided by Real Networks, which allowed iPod owners to listen to the music they

purchased from the Real store on their iPod players.

DRM systems create an unprecedented difficulty for consumers, because they give entertainment companies and DRM vendors the ability to eliminate the very features that caused consumers to buy their wares in the first place. This system invites abusive practices whereby consumers can be tricked into buying technology they would otherwise pass over due to its restrictiveness.

Summary:

- DRM systems retard innovation, putting new features under the veto of incumbent industries who fear being out-competed by new market entrants
- "Renewable" DRM can be used to cheat consumers by removing or altering features after they have bought their devices

Disabled people

In many countries, copyright law specially recognizes the primacy of the concerns of disabled people over the rights of authors. In the USA, any not-for-profit organization may make an "assistive" edition of a book (e.g., a Braille or audio edition) without seeking the author or publisher's permission. It is common for countries to enact exceptions and limitations on these lines for deaf and blind people, and other persons with disabilities.

The advent of digital technology makes it easier than ever for disabled people to enjoy the same media as people without disabilities. A digital book can be read aloud by a blind user's computer, sparing her the need to wait until volunteer can be found to record an audio version. Indeed, for the first time the blind can enjoy newspapers at the same time as the sighted, simply by "reading" them through a Web-browser that reads the articles aloud to them, or exports them via a Braille terminal.

Deaf people can reap these benefits too: hobbyists known as "fan-subbers" add their own subtitles to foreign movies and release subtitle-files over the Internet. In the main, these hobbyists engage in subtitling in order to translate foreign films to their own languages, but deaf people collect the dividend for their labor.

However, DRM systems stymie these activities. Adobe's ebooks come with the capacity to be read aloud by a computer, but allow authors to switch this capability off. Other ebook technologies lack this capability altogether, and actively prevent interoperability with third party software such as text-to-speech programs.

Likewise, the need to circumvent DVD DRM in order to add fan-subs means that fansubbing is *per se* an illegal activity.

If DRM is allowed to creep into more areas of cultural and knowledge production, these

effects will only grow. Digital technology has the potential to revolutionize the lives of disabled people, but DRM removes that potential. Thus, DRM nullifies copyright exceptions, erecting a technological barrier where no legal barrier exists.

Summary:

- Copyright law often affords rights to disabled people that trump the rights of authors
- DRM lets private rightsholders unilaterally prevent the exercise of those rights
- The ability of disabled people to benefit from digital media is badly undermined by DRM

Libraries

Libraries have a fundamental role to play in the development of a democratic society by enabling access for all members of the community to a wide range of knowledge, ideas, opinion as well as cultural, scientific and educational information. Access to information is essential in education and research and has a direct impact on literacy levels, economic growth and quality of life.

ICTs and digital information have opened up great new opportunities to access to essential content and provide innovative services e.g.

- libraries in developing countries are gaining affordable access to the wealth of international academic journals and databases e.g. assisted by eIFL.net, a multi-country purchasing consortium[9];

- the 86% literacy rate in the Nkayi District in Zimbabwe is attributed to library services including the donkey-drawn mobile library which brings Internet access to rural areas[10];

- a digital bookmobile and print-on-demand service brings much needed information for education, primary health care, AIDS prevention, agricultural techniques and democratic participation to rural villages in Uganda empowering people and improving their lives[11];

- the Rice Knowledge Bank, a digital rice production library, provides farmers, NGOs and governments in more than 50 developing countries with unprecedented access to rice knowledge, training and technology transfer skills. The Rice Doctor is a field diagnostic tool for identifying factors limiting rice crop growth. The result is improved rice technology and better production yields for farmers[12].

How will such services operate with DRMs? Libraries provide access to digital material

through a variety of legal constructs; license agreements, exceptions under national copyright law, legal deposit, the public domain. DRM poses a threat. At worst, it can block access, at best it can inhibit by making access time-consuming and costly to arrange.

Libraries in the west are already experiencing the problems associated with DRM. Material bought and paid for by the library has become inaccessible through technical protection measures, while the supplier has since gone out of business or it is not profitable for the vendor to correct the problem and the sums of money are too small for the library, even if it has the financial resources to pursue legal action. The result is that the material is effectively removed from the library collection.[13]

Anti-circumvention laws prevent libraries from availing themselves of their lawful exceptions under national copyright laws. This can prevent or place restrictions on copying or sharing or lending material, current awareness services, book reviews, exhibitions, sending information to students who cannot come into the library. In short, libraries have less rights in the digital environment than in the print world. Instead, libraries are having to negotiate special agreements with individual rightsholders to obtain DRM-free material or permission to circumvent in restricted circumstances. This is an option realistically enjoyed only by the largest and best resourced libraries. The result is that the digital divide will increase as under-resourced libraries or those in smaller, rural or underprivileged communities (ironically standing to benefit most from digital technologies) lose out on their statutory rights.

Libraries and archives play a crucial role, and some have a legal mandate, to preserve and make available our cultural and scientific heritage for future generations. DRM jeopardizes this role as they have the potential to lock away covered material forever. The issue of long term preservation carries a real urgency as media must be adapted regularly to new data formats, operating systems and data carriers. In addition, data (e.g. music, software, electronic journals) stored in propriety DRM formats is at much greater risk of being lost once the playback media is no longer available. Under DRM, there is a great risk that the public record of the future may be distorted.

Summary

- The success of the information society depends on digital content being accessible. Digital content must not locked up behind technical barriers.
- Libraries must not be prevented by DRM from availing themselves of their lawful rights under national copyright law and must be able to extend their services to the digital environment.
- Long term preservation and archiving, essential to preserving cultural identities, maintaining diversity of peoples, languages and cultures and in shaping the future, must not be jeopardized by DRM.

DRM in the developing world

As dangerous as DRM is to competition, consumer rights, disabled people, research, archiving and discourse in the developed world, it poses even graver risks in developing nations. Developing nations are especially at risk from the previously enumerated dangers from DRM, but DRM brings risks that undermine development and culture in the developing world.

DRM and domestic policy

DRM enshrines assumptions about the legitimate activities of its users in technology. This means that DRM allows rightsholders to enforce exclusive rights in excess of those granted by local copyright.

More subtle and dangerous is the way that DRM imposes rich-country values on poor nations. Most DRM systems are now being built on an assumption of ubiquitous Internet access. In addition, many DRM vendors have developed technologies that rely on a "return path" -- that is, a network connection that DRM-restricted media can use to verify that it is allowed to play,or to charge per viewing. This is well and good in countries that have reliable electricity and telecoms, but it is unworkable in nations where these are in scarce supply.[14]

Some DRM systems contain the notion of a "household" or "family" and attempt to limit the playback of media to the members of a single household. These systems contain upper limits on the size of "families," on the number of physical locations that can be considered part of a single "household" -- even on the number of times that a device can join or leave a single household, in effect, a technological limit on child custody arrangements, work-abroad programs and divorce and marriage.

These systems are an insult to national sovereignty and the right of nations to define their own cultural, family, and technological policies.

Summary:

- DRM systems overrule local copyright limitations
- DRM systems often assume infrastructure that isn't present in the developing world
- DRM systems make rich-country assumptions about family and domestic life that are inappropriate to many developing countries

Local performers and authors

DRM systems are universally governed by patents and secrets that are licensed out by cartels and licensing bodies such as the DVD-CCA. If local artists and publishers are pressured to use these systems, they become beholden to these cartels, who set the terms

under which their cultural products can be disseminated and often charge a royalty for every use of their DRM systems. In effect, this is a tax on local culture that is paid into the pockets of rich, developed-world cartels.

For example, the "Open Mobile Alliance" DRM[15] for mobile phones is used to restrict the playback of video and audio. Many mobile carriers are locking their devices so that only Mobile Alliance-locked media can be played on them. Every Mobile Alliance-locked song that is distributed carries the requirement of a royalty paid to the Mobile Alliance cartel.

If a musician in a developing nation wants to make his music available to his countrymen to listen to on these phones, Mobile Alliance DRM would limit his ability to do this unless he could afford to pay the foreign cartel for the privilege of locking his media in their safes.

If a national public-service broadcaster wants to allow the citizens it serves to watch and disseminate its programs, for example, a program on malaria prevention or adult literacy, it will have to pay a fee to Mobile Alliance to make its product available.

The use of DRM in cultural production turns performers and authors and audiences into customers of rich-country companies, mere intermediaries who act as gatekeepers and add no value.

Summary:

- DRM systems require that their users take a restrictive license from a cartel, often at a high cost
- These licenses have the effect of turning publishers and performers and authors into customers for developed-world intermediaries to whom they become beholden

Resale of goods

Developing nations have long relied on used and second-hand goods as a source of low-cost materials. Used school-books, computers, and instructional materials are a mainstay of development efforts around the world.

However, DRM often prevents the re-sale -- or even the outright donation -- of goods. iTunes songs and Adobe ebooks are just two of the many DRM goods that cannot be sold on, lent, or given away due to technological restrictions.

The use of DRM to restrict the passing on of goods is an inconvenience in the developed world, but in the developing world, where used goods are critical to development, it presents a special danger.

Summary:

- Developing nations have a widespread reliance on low-cost used goods
- DRM systems are used to prevent the re-sale, lending and donation of information goods

Public Domain

Some information goods belong to no one. These are goods in the "public domain." Many of these are older works in which the copyright has expired -- for example, the novel Don Quixote, Plato's Republic, or the early recordings of Elvis Presley -- while others are comprised of "non-copyrightable" subjects (e.g., factual materials, many governmental publications).

The public domain is a rich well that all may drink from. Companies like Disney rely on the public domain to adapt popular movies like Snow White. Researchers and scientists use the public domain as a repository for the factual material that underpins their work. Anyone may use a public domain work without cost or permission, and it is for this reason that so many of the most important cultural institutions around the world -- from famous novels to iconic images -- have maintained their vitality.

DRM systems can be applied to public domain works as readily as they can be applied to copyrighted works. This is a kind of brazen banditry in which a DRM is used to claim ownership rights in works that belong to the public. For example, Adobe ebook DRM has been applied to public domain novels such as Alice in Wonderland and DVDs of public domain movies have been sold with the CSS DRM system in place.

In the developing world, the public domain is a potential source of health, education, and scientific information. The indiscriminate application of DRM to public domain information threatens this source of development.

Summary:

- Many works are out of copyright or were not copyrightable to begin with
- These works are a potential free library for developing world educators, researchers and development workers
- DRM can be used by companies to assert ownership of these public goods

Free and Open Source Software

Free and Open Source Software (FOSS) is software that is developed through the communal efforts of volunteer programmers. These programs (which include the world's most popular server operating system, mail-server and web-server, as well as the free web browser Mozilla) are released under licenses that allow anyone to improve upon them. It is for this reason that these systems have found enormous utility in development efforts, as in Brazil's "telecenter" Internet shops.

The openness of FOSS makes it possible for anyone to undertake "localization" efforts that translate programs and services into local languages. Mozilla has been customized into regional languages such as Slovenian, Turkish and Brazilian Portuguese. It is for this reason, too, that FOSS is a tool of choice for development efforts in countries where the local language isn't some colonial hangover.

But FOSS is incompatible with DRM. FOSS is software that comes with the tools and permissions necessary for its users to understand its workings and improve upon it. For FOSS to work, every user must have the right to examine FOSS programs.

DRM, however, requires that users be locked out of their devices. Every DRM licensing arrangement contains a disingenuously named "robustness" clause that requires implementers to design their systems so that users can't "hack" them -- that is, so that their users can't readily modify or even examine the software and devices they own.

The upshot of this is that there has never been a DRM technology licensed for use in a FOSS implementation. In the US, the recent "Broadcast Flag" regulation has banned the use of FOSS in connection with all digital television applications.

Summary:

- Free and open source software is critical to current and future development efforts as it provides a hedge against anticompetitive behavior, and is readily localized into local languages
- DRM technologies cannot be embodied in FOSS and so any field where DRM is adopted crowds out FOSS and eliminates the development benefits therein

Region coding

Many DRM schemes are used to enforce "region coding" or "windowing" of information goods. This is on the assumption that once information goods are made available to poorer countries at a lower price, these will be imported to richer countries and undermine sales there.

So region-coding schemes are used to see to it that information goods can only be consumed in poor countries after all possible revenue has been wrung from the rich countries. This has the effect of making the world's poor countries the "last to the party" for virtually every legitimate game and DVD offering. If DRM is applied to other information goods -- like music and textbooks and other literature -- they will likewise be offered last to the developing world.

Summary:

- Windowing and region coding are used to discriminate against poor countries by

offering them information goods only after they have exhausted their commercial potential in rich countries

Distance education

Many developing countries are still struggling to establish reasonable access to primary education. With the enormous capital and infrastructure costs associated with on-campus higher education, it is essential to allow developing countries wishing to create greater access to education to include distance education as one of the solutions.

Distance education gives rise to complex copyright and related rights issues related to both the question of ownership of the newly created work, as well as the question of "fair use" of existing materials.

The use of new technologies in innovative education demands full reconsideration of the ability to use existing DRM-restricted materials in distance education.

Laws on copyright and related rights often provide special rights to distance educators. (even in the USA, such as the Teach Act, and in Europe, which has a variety of exceptions for distanced education).

DRM can effectively eliminate these rights. For distance educators and distance learners it is important that DRMs do not prevent displays of materials in a quantity similar to that which would be displayed in the live classroom setting during "mediated instructional activity."

DRM can undermine the ability of distance learners to benefit from digital media if there are obstacles to digitization of some analog works that are not already available.

DRM can prevent distance education institutions from storing and transmitting content as necessary in duration and location for reaching learning objectives

DRM also will be used to practically eliminate the first sale doctrine -- by making it impossible to have a second hand market for teaching materials. Even worse, an institution could find that every class needs to repurchase the materials, every teaching period (which in distance education needs to be re-defined). This could cause enormous increases in the cost of any teaching program, including distance education materials. It will be a particularly difficult problem for distance education, which will tend to rely upon digital materials. 22

Finally, the Berne Convention Appendix does not apply to digital materials and developing countries cannot benefit from its use to achieve a balance between enforcing copyright restrictions, while permitting developing countries educators and learners to create, translate

or use materials in distance education.

Summary:

- Distance education is a key means of providing access to education in the developing world
- DRM undermines distance education by raising the cost of providing instructional materials and by placing barriers to storing, transmitting and using distance education materials.

DRM can't benefit local cultural production

In many countries, local culture industries have been intensively lobbied by DRM companies and foreign media giants to convince them that DRM is the key to their long-term health. But DRM -- which does *not* stop the unauthorized recirculation of work and which does *not* ever pay artists -- turns every producer and consumer of culture into a customer of DRM companies.

A useful analogy can be drawn to the packaged software industry's flirtation with DRM in the 1980s. At the height of this boom, DRM schemes were employed by virtually every software company, who required their customers to undertake burdensome, tedious rituals in order to use their software, such as keying in the response to "What is the tenth word of the third paragraph of the 275th page of the manual?"

The software companies of the day were convinced that their customers were crooks, and that they would rob them into the poorhouse, and so they implemented more and more measures that made it harder to use their products.

However, the thing that drove these companies out of business, by and large, was not customers who made illicit copies of their software. It was that a single player, Microsoft, gained control of 97 percent of the operating system market, and leveraged that control to destroy the healthiest market-segments in the industry.

For example, Delrina was a company that made the most popular fax software of its day. It used extensive countermeasures to fight its customers' copying.

But ultimately, the thing that destroyed Delrina was the inclusion of a free fax application that Microsoft developed and deployed with every copy of Windows. Once that had come to pass, no user would ever have a good reason to buy a fax package again.

Today, Microsoft and other DRM vendors have convinced many entertainment companies that they are doomed if they don't police their customers' behavior. They propose DRM as the answer to this.

But DRM is a lock-in technology. Culture industries that adopt DRM have to pay license fees to DRM vendors and seek their permission when they want to extend the functionality of DRM.

Just as in the 1980s, software companies were sold on policing customer behavior by DRM providers that ultimately drove them out of business, today, performers and authors and publishers are being sold the same bill of goods.

Summary:

- DRM can't "keep honest users honest" -- users are either honest or they aren't
- Adopting DRM locks your industries and your citizens into a DRM vendor for all time

DRM has been a total failure at keeping works offline

The "DRM hypothesis" is that the public is dishonest, and will do dishonest things with cultural material if given the chance. DRM is deployed in order to force dishonest customers to behave honestly and buy media and to limit their activities to those that are authorized by rightsholders.

For this to work, it must be impossible for a potential customer for media to locate a non-DRM copy of their chosen movies, books, games or music. If a dishonest customer for an ebook can download an un-restricted version of a book that is otherwise available in a restricted DRM format, she surely will.

But DRM is simply not very good at doing this job. Because DRM is based on "security through obscurity" -- that is, in hiding from a user the way that it works -- it is inevitably broken in short order and the materials that it covers are put on the Internet where anyone can download them.

Indeed, there has never been a single piece of DRM-restricted media that can't be downloaded from the Internet today. In more than a decade of extensive use, DRM has never once accomplished its goal.[16]

Summary:

- For DRM to work, it must succeed in keeping materials off of the Internet
- But no piece of DRM-restricted media has ever succeeding at doing this

Successful local culture providers are turning to copyleft

Where governments and educational institutions have taken an interest in promoting culture and access to information, they have turned away from DRM and toward "copyleft" -- content licenses that allow for noncommercial improvement, re-use and sharing of information goods.

First among these is Creative Commons[17], a set of international licenses that are being translated to 28 legal systems and languages. Some ten million works have been licensed under Creative Commons, and Creative Commons licenses preclude the use of DRM.

In the developed world, the British Broadcast Corporation (BBC) has undertaken the most

ambitious copyleft project in the history of the world: the "Creative Archive"[18] will place online the millions of hours of radio and television content that it has commissioned at Britons' expense. This material will be placed online under a license that allows for noncommercial use and remixing.

Likewise, the Canadian Broadcasting Corporation has just placed the engine behind its most substantial original Web materials, a Web "channel" called "Zed.cbc.ca" under an open source license[19].

And no less an institution than the Massachusetts Institute of Technology (MIT) has placed all of its courseware online under a Creative Commons license that is being used by learners around the world.

With all this freely copyable material, local culture has full permission to adapt these things to its own needs, translating, excerpting, modifying, and distributing as required. Indeed, the modifications made in developing countries can be contributed back to world culture on the same terms, enabling multi-cultural collaboration. The developed world has a lot to learn from the developing world -- and developing countries can collaborate with each other to produce locally appropriate versions of cultural and scientific materials available under these free licenses.

Summary:

- Rich countries are developing ambitious programs to put the "crown jewels" of their culture online without DRM and without legal restriction
- If you adopt DRM, your local culture will be crowded out by this freer, more open culture

Conclusion

Policy-makers around the world have to juggle many priorities: industry, public interest, cultural preservation, education, and so forth. DRM has been positioned by its adherents as a system for accomplishing many of these goals with little cost. In fact, the reverse it true: DRM exacts a terrible cost to the public, to performs and authors, to educators and cultural institution, and it delivers nothing in return. DRM is a system for delivering less freedom to performers and authors and the public while charging more. It is all cost, no dividend.

The alternative to DRM is to promote culture and the arts through open licensing and business-models that avoid Hollywood's doomed strategy of treating their customers like criminals. The iTunes Music Store manages to make millions of dollars selling music that can be downloaded for free (just as Evian makes billions selling water that can be garnered for free from the kitchen tap) by offering a superior, competitive product.

DRM has no nexus with promoting culture or stopping infringement. The rent it exacts from the nations it colonizes is too dear for anyone to bear.

1. See http://www.cptech.org/ip/wipo/genevadeclaration.html for more
2. See http://www.iprsonline.org/unctadictsd/bellagio/docs/Okideiji_Bellagio4.pdf
3. James Boyle, “A Natural Experiment”, November 22, 2004, http://news.ft.com/cms/s/4cd4941e-3cab-11d9-bb7b-00000e2511c8.html
4. Schneier is the author of such books as *Applied Cryptography*, *Secrets and Lies*, and *Beyond Fear*; see http://www.schneier.com/
5. GNU/Linux is a free operating system produced by volunteer effort that is in widespread use throughout the developing world, and it has been held to be critical to the successful development efforts in countries such as India and Brazil
6. For instance, there are anti-circumvention obligations in the draft Free Trade Area of the Americas agreement being negotiated by the 34 countries of the Western hemisphere, in the U.S.- Morocco bilateral Free Trade Agreement, and the U.S.-Central America regional free trade agreement.
7. see http://www.theinquirer.net/?article=19246
8. see http://www.allyourtv.com/0405season/news/november/11282004transitional.html
9. see www.eifl.net
10. see Donkey Drawn Mobile Library Services in Zimbabwe, IFLA report No 72
11. see http://www.anywherebooks.org
12. see http://www.knowledgebank.irri.org/
13. see http://www.copyright.gov/1201/comments/reply/034dillon.pdf
14. Indeed, in the developed world, this can have disastrous consequences for the public, as in January 2005, when there was a catastrophic failure of the Valve DRM server used to verify the registration keys for players of the popular game Half Life 2. Though the game was the players' property and though the players wished merely to play them *on their own computers*, the failure of a network service rendered their property worthless.

15. See http://www.openmobilealliance.org/
16. A very good explanation of this is to be found in a paper written by four Microsoft engineers, "The Darknet and the Future of Content Distribution," see http://ideas.repec.org/p/cla/levarc/618897000000000636.html
17. See http://creativecommons.org for more
18. see http://www.bbc.co.uk/pressoffice/pressreleases/stories/2004/05_may/26/creative_archive.shtml
19. see http://zed.cbc.ca/opensource