RESEARCH PAPERS

13

TOWARDS A DIGITAL AGENDA FOR DEVELOPING COUNTRIES

Dalindyebo Shabalala*

SOUTH CENTRE

AUGUST 2007

* Dalindyebo Shabalala is a Staff Attorney and Director of the Intellectual Property and Sustainable Development Project at the Center for International Environmental Law (dshabalala@ciel.org). The views expressed in this paper are the personal views of the author and do not necessarily represent the views of the South Centre or its Member States.

THE SOUTH CENTRE

In August 1995 the South Centre was established as a permanent inter-Governmental organization of developing countries. In pursuing its objectives of promoting South solidarity, South-South cooperation, and coordinated participation by developing countries in international forums, the South Centre has full intellectual independence. It prepares, publishes and distributes information, strategic analyses and recommendations on international economic, social and political matters of concern to the South.

The South Centre enjoys support and cooperation from the governments of the countries of the South and is in regular working contact with the Non-Aligned Movement and the Group of 77. The Centre's studies and position papers are prepared by drawing on the technical and intellectual capacities existing within South governments and institutions and among individuals of the South. Through working group sessions and wide consultations, which involve experts from different parts of the South, and sometimes from the North, common problems of the South are studied and experience and knowledge are shared.

ACKNOWLEDGEMENT

The author would like to thank Alan Story and Luis Villareal as well as the South Centre staff for their extremely helpful comments and suggestions. A special thanks to Sisule Musungu, Prof. Carlos Correa and Prof. Ruth Okediji for giving me a chance and getting me this far; may I live up to the faith you have shown.

Finally, to my wife Karin, for your thoughts, your love, and especially patience, patience, and more patience.

TABLE OF CONTENTS

LIST OF ACRONYMS

CDs	Compact Discs
CSS	Content Scrambling System
DMCA	Digital Millennium Copyright Act
DRM	Digital Rights Management
DVDs	Digital Versatile Discs (formerly Digital Video Discs)
EFF	Electronic Frontier Foundation
FLOSS	Free/Libre Open Source Software
ICT	Information and Communication Technology
GDP	Gross Domestic Product
GPL	GNU General Public License
HTML	HyperText Markup Language
ICTs	Information and Communication Technologies
IGCSE	International General Certificate of Secondary Education
ISPs	Internet Service Providers
LANs	Local Area Networks
LP	Long Play disk
PDF	Portable Document Format
MIT	Massachusetts Institute of Technology
NGO	Non-Governmental Organization
P2P	Peer to Peer
RMI	Rights Management Information
SSRN	Social Science Research Network
TCO	Total Cost of Ownership
TPMs	Technological Protection Mechanisms
TRIPS	WTO Agreement on Trade-related aspects of Intellectual Property Rights

UNESCO	United Nations Educational, Scientific and Cultural Organization
WANs	Wide Area Networks
WCT	WIPO Copyright Treaty
WIPO	World Intellectual Property Organization
WPPT	WIPO Performances and Phonograms Treaty

EXECUTIVE SUMMARY

The last two decades of the 20th century saw a revolution in the nature of information and the way that it can be created, used and transmitted. Vast opportunities have been opened up. Developing countries, that have insufficient capacity to generate, disseminate and effectively utilize educational information and knowledge, may finally be in a position to accelerate their development.

Digital and internet content is the key to these opportunities. With it, the cost of producing, copying and disseminating any piece of information approaches zero, and any person with access to a computer and the internet can be as powerful a distributor of information as a major company. The major content industries have had their primacy over production and distribution channels challenged.

Many developing countries have not fully analyzed the policy implications of access to, and control over, digital and internet content. This paper analyzes the implications of digital and internet content policy for access to knowledge in developing countries and makes some initial recommendations for developing countries. By bringing together several different strands of discussions and analyses ongoing at national and international levels, it aims to provide a direction for further research and policy analysis, by laying the groundwork and creating awareness of the relevance and scope of digital and internet content for developing country policymakers.

The paper concludes that:

- Digital and internet content presents developing countries with the opportunity to clearly determine in what way their development interests would be served by particular forms of copyright regimes. That opportunity converges with a moment in international policy-making that presents real scope for developing countries to implement development-appropriate copyright regimes.

- Digital and internet content present real short term and long-term opportunities for greater access to education information and the development of indigenous industries. The opportunities are threatened by the response of major rights-holder industries who have responded by:

    - selectively extending copyright principles to digital and internet content;
    - seeking the expansion of copyright and related rights subject matter;
    - creating and enforcing Technological Protection Measures for digital works; and
    - seeking new international norm-setting processes on digital and internet content such as the WIPO Copyright Treaty, the WIPO Performers and Phonograms Treaty, and the proposed WIPO Broadcasting Treaty.

- The expansion of protected subject matter provides little that would be of benefit to developing countries.

- Technological protection measures and digital rights management systems present a real and present danger to access for developing countries and provide no added value for the development of indigenous industries such as publishing and music industries.

- The new global norms contained in the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) limit whatever access developing countries

may be able to achieve in the long-term. In addition, for those countries that already have some access, the short-term costs of access to information will increase substantially.

- The conditions necessary for developing countries to begin to take advantage of digital and internet content must include: strong and robust education and library exceptions; and a strong and broad research and study exception.

- Existing decisions on the scope and value of the three-step test still leave the issue open for developing countries to develop practices of their own with respect to the standard provided by the test. As far as digital and internet content is concerned, the WCT and WPPT agreed statements cabin the three step test and place it in proper perspective as an open-ended enabling tool for crafting exceptions without actually pre-determining the scope of those exceptions beyond the Berne Convention.

The paper recommends that developing countries implement the following:

Immediate Actions

- Do not sign TRIPS-Plus, WCT and WPPT provisions on Technological Protection Measures. Those countries that have not signed the WCT and the WPPT should refrain from signing them. Those who have should reconsider their participation in the treaties.

- Maintain and fully implement existing exceptions and limitations

- Focus copyright enforcement on the protection of domestic artists, not border controls for cultural goods from developed countries.

- Limit software copyright protection only to the non-functional aspects of software. Do not provide patent protection.

- Do not extend protection to non-original databases.

Next Steps

- Negotiate Special Provisions for Bulk Educational Access for Developing Countries.

- Formulate new and appropriate limitations for digital and internet content. A good beginning would address the following issues in the near term:

    - limits on technological protection measures;
    - an exception for Search Engines;
    - an exception for ISPs and P2P and other service providers;
    - exceptions for Temporary, Incidental and Ephemeral copies;
    - no enforcement of unfair copyright licensing contracts.

- Adopt and support Free/Libre/Open Source approaches to software and other content.

I. INTRODUCTION

The last two decades of the 20th century saw a revolution in the nature of information and the way that it can be created, used and transmitted. At no other time in history has so much information been potentially available at such low cost and at such speed and volume. Vast opportunities have been opened up for marginalized and peripheral communities and individuals to access knowledge and information. Developing countries, who suffer from a lack of resources in the very area that is the primary lever for economic and social development i.e. educational information and knowledge, may finally be in a position to accelerate their development.[1]

The information revolution is possible because of digitization: the ability to translate information, primarily text, image, sound, and audiovisual material, into a common, digital format that can be used by different devices and transmitted across multiple networks, such as the internet. Such content is 'digital'. The technologies and devices that translate, manipulate and communicate digital content have come generally to be captured under the umbrella term of information and communication technologies (ICTs).[2] ICTs have become an accepted and integral part of the ongoing discussion about the necessary and sufficient elements for economic development in developing countries. Major UN agencies have mainstreamed ICT into their development policies as have many major donors and developing countries.[3] While the evidence for the benefits of ICT for development is not fully fleshed out, the obvious contributions to productivity in developed country economies are a basic appeal to common sense notions of efficient access to, and use of, information resources as a result of globally reduced transaction costs.[4]

However, in the rush to pursue and adopt ICTs, the crucial issue of access to, and control over, digital and internet content has not always been fully analyzed or considered. Many countries have rushed to adopt policies on access to ICTs without fully analyzing the policy implications and interaction with access to knowledge for their citizens.[5] Digital and internet content allows the creation of perfect copies at very little cost and allows distribution without any destruction of the original. When the cost of producing, copying and disseminating any piece of information becomes as cheap as to approach zero, any person with access to a computer and the internet can be a powerful distributor of information, comparable to a company or government department. In particular, the major industries dealing with the production of text, music, films, and television programmes (content industries) have had their primacy over production and distribution channels challenged by digital and internet content. However, digital and internet content also presents an opportunity for greater profit and greater control for the content industries, as such content is also more susceptible to having controls embedded within it. The threat to control and the potential for greater profits have resulted in a complex set of responses from the major content industries, including: i) the selective expansion of copyright law; ii) new and more stringent international copyright norms and iii) the development of new information control technologies. These responses threaten to close off the possibilities for

---

[1] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002), at 8. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[2] This includes computers, computer networks, telephones, mobile telephones, mobile phone networks, fax machines, computer printers, cable television networks, radio networks.

[3] See e.g. United Nations Development Programme *Human Development Report* (UNDP 2001) (available at http://hdr.undp.org/reports/global/2001/en/ last visited February 13, 2007)

[4] See C Neto "Development Theory and Foundations of Universal Access Policies" Yale Law School Student Scholarship Series No. 12, 2005, at 12. (Available at http://www.is-journal.org/V02I02/2ISJLP365-Neto.pdf last visited February 13, 2007)

[5] Neto would attribute this to the neo-liberal focus on capital investment as the primary policy focus, ignoring the methods by which spillover from investment in ICTs can be blocked.

developing countries opened up by the adoption of ICTs and destroy the potential for increased access to knowledge.

The nature and scope of the opportunities and the challenges facing policymakers in this arena, while apparently self-evident, remain in reality largely unexamined, especially where developing countries are concerned. There is a real need for work that addresses what is encompassed by the information revolution, the industries and social sectors and the ways that developing countries can take advantage of it. The policy question for developing countries is critical. It is made only more complicated by the fact that it requires coordinated planning across several large policy areas such as telecommunications, copyright, patents, education and culture. The issue is also complicated by the significant variation among developing countries (including least developed countries) in terms of access to ICTs, internet penetration, and other information infrastructure.[6] Nevertheless, this paper attempts to point to opportunities and challenges, although these may not always be applicable to all countries encompassed under the definition of developing countries.

This paper analyzes the implications of digital and internet content policy for access to knowledge in developing countries by addressing only a small portion of the larger ICT picture. It also puts forward recommendations for developing countries to fully enable ICT policy to deliver on the promise of more knowledge and information, especially for education. Section II of this paper begins with a brief copyright primer, introducing relevant issues in copyright. Section III is an exploration of the nature and scope of digital and internet content, and its relevant uses for developing countries. Section IV describes the policy problem that digital and internet content presents for the creation, distribution and access to knowledge. Section V analyzes the response to the policy problem from the major content industries and discusses its limitations. Finally, Section VI outlines policy considerations for developing countries and makes recommendations for the way towards a digital agenda for developing countries.

[6] See UNCTAD "Information Economy Report" UNCTAD 2005, at 3. (Available at http://www.unctad.org/en/docs/sdteedc20051_en.pdf last visited February 13, 2007)

II. A COPYRIGHT PRIMER

Copyright is an incentive system that works to encourage the creation and dissemination of ideas as widely as possible, by conferring an exclusive right to a creator/author, for a limited (but long) period, to reproduce the form in which the idea is expressed. The assumption underlying this incentive system is that there is a large pool of material that can only be unleashed if individuals receive profit to create and disseminate work.

What can be copyrighted?

Copyright protects literary or artistic works. Different countries include different subject matter under this definition e.g.

- literary works such as novels, poems, plays, reference works and newspapers;
- characters (like Mickey Mouse);
- films, musical compositions (the musical notation), and choreography;
- artistic works such as paintings, drawings, photographs and sculpture;
- architecture;
- advertisements, maps and technical drawings;
- computer programs, whether in source or object code;
- compilations of data.

Copyright protects the *form* or *expression* of an idea, not the idea itself. The idea/expression dichotomy is essential to the definition of copyright. Without it, the basic justification of copyright, i.e. the dissemination of ideas and information, would be untenable. Copyright allows the rights-holder control over a specific embodiment of an idea, but the idea itself may be used and incorporated by others in their own intellectual creations. The line is not always clear cut and different countries draw it with various degrees of clarity.

To qualify for protection, a work must be *original*. Countries approach the originality requirement with varying degrees of strictness. In the United States, courts have required only that the work not be a copy, thus avoiding passing judgment on the level of creativity in a work. In continental Europe, the requirement has generally been higher i.e. that the work exhibit some artistic merit. Countries are free to set the level of originality at whatever level they deem appropriate.

There are other requirements that may be imposed by national law. Countries may require that the expression be fixed in a medium, either written down or recorded in some fashion that is communicable to others. This has a largely evidentiary purpose since there is generally no requirement that a copyright be registered to qualify for copyright protection. It simply makes it easier to establish the date when the idea was first expressed.

How is copyright acquired?

Copyright automatically adheres to a work provided that it is original. For all states that are parties to the Berne Convention[7], the copyright is automatic and global in application, although subject to differing national exceptions and limitations as well as scope. For member states of the Berne Convention there is no requirement to register with a copyright office. Some states may require that it be registered if a copyright holder wishes to bring an infringement suit. The Berne Convention made the acquisition of copyright instantaneous and global in a time when most products did not cross borders as efficiently. In the new digital era where products do cross borders easily, it has become a powerful tool for rights-holders in the global market.

What rights are conferred by Copyright?

A copyright grants the rights-holder the exclusive right, for a minimum of 50 years (under TRIPS, if calculated on a basis other than the life of the author[8]), to exercise and/or authorize the:

- reproduction;
- public performance and communication to the public of a performance;
- the recording or broadcasting; and
- translation, and adaptation of the work.

These are considered the economic rights. The rights-holder may demand payment (royalties) for authorisation and, in the event of any unauthorised act, has the right to enforcement action, either through the civil or criminal system, to stop such acts, and to gain restitution for damages. Some states provide other rights such as distribution, lending and rental rights.

In those states that are signatories to the Berne Convention, the rights-holder may also have moral rights, which give the author the right to claim authorship and to object to:

- any distortion, mutilation or other modification of,
- or other derogatory action in relation to the work, which would be prejudicial to [the author's] honour or reputation.[9]

The rights-holder may assign all or a portion of the economic rights granted by the copyright, but none of the moral rights. In addition, moral rights may only be held by natural persons, not legal entities like corporations or collective rights management groups. The rights-holder has the right to enforcement of moral rights, but the extent and nature of such action is dependant on national law.

What are the exceptions to rights conferred by copyright?

- Fair use, fair dealing or legal use without authorization: the exceptions allow copying for such things as personal use, research, education, archiving, library use and news reporting, without requiring permission of the author and/or remuneration. These are some of the commonalities but the terms fair use (largely United States), fair dealing (largely United

[7] Berne Convention for the Protection of Literary and Artistic Works (Paris Text entered into force July 24, 1971, amended September 28, 1979). (Available at http://www.wipo.int/treaties/en/ip/berne/index.html last visited February 13, 2007)

[8] Article 12, Agreement on Trade-Related Aspects of Intellectual Property (TRIPS Agreement) (signed15 April 1994) (Available at http://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm last visited February 13, 2007)

[9] Article 6bis, Berne Convention for the Protection of Literary and Artistic Works (Paris Text entered into force July 24, 1971, amended September 28, 1979) (Available at http://www.wipo.int/treaties/en/ip/berne/index.html last visited February 13, 2007)

Kingdom and Commonwealth) as well as legitimate use without authorization, indicate different scope and practices and can encompass other exceptions and limitations. These kinds of exceptions are the most important safety valve to ensure that copyright serves its primary purpose of greater dissemination of knowledge. It also establishes the basic principle that there are uses (and users) from which a copyright holder has no right or policy reason to expect profits. Continental systems typically address the issue of exceptions through closed lists of exceptions rather than an open-ended principle.

- Exclusion from Copyright protection: some subject matter that would nominally be copyright protected is excluded by the nature of the manner in which it is generated. Some of these can include legal texts, judicial decisions, certain speeches (article 2*bis* of the Berne Convention).
- Independent Derivation: where an individual has independently expressed their work in the same manner without copying or adaptation, both individuals have separate copyrights and cannot be held liable for infringement. The easiest example is two photographers who take the same exact picture of the same scene. Each photograph has an independent creation and therefore independent copyright.
- First Sale: the concept is that, as with any product, once a consumer has bought a product, the rights of the intellectual property holder to determine what a person does with the physical product are exhausted. An individual can sell the product and the rights-holder has no expectation of profit from that second or subsequent sale or exchange.

One caveat to all of this, however, is the requirement that, whatever the national law, non-nationals must be accorded the same treatment as nationals. This is true for all members of the Berne Convention and with the incorporation by reference of the Berne Convention, to all TRIPS members as well. Thus, the advantage that many developed countries had to boost their own domestic industries in earlier developmental stages e.g. the United States *vis-à-vis* the United Kingdom in the early days of the United States Republic, is lost for developing countries.

III. THE NATURE AND SCOPE OF DIGITAL AND INTERNET CONTENT

Opportunities can only be grasped if one understands the nature of what is being presented. Policy making in the area of digital and internet content requires clarity about what 'digital and internet content' encompasses, and the uses to which it can be put. This section will try to outline the outer boundaries of the concept and present some uses of that content that are of potential relevance to developing countries.

III.1 What is Digital and Internet Content?

Content, as it is now understood, can be divided into two basic categories: analog or digital. Analog can be understood as the fixation of a work "through some human or mechanical process of deforming a physical object […] in a manner that conveys an image […] or signal in a varying frequency […] or light or colour intensity."[10] Analog works by recording a continuous (thus literal) representation of the work in a physical medium. An analog representation, such as an LP record or a painting, has to be manipulated as a whole. In a sense, analog content works by making a direct analogy between the content and the physical form in which it is represented. Traditionally, analog content is classified into the following general categories:

- Text – consisting of words or numbers in meaningful combinations such as sentences, phrases, books, and mathematical formulae. Analog format largely requires fixation of symbols (e.g. words) onto a surface that can be directly read and understood by humans.
- Audio – essentially, sounds which can be perceived through the ear. Analog format maintains a physical relationship between the different sound frequencies e.g. the distance between the notches and grooves in LP records represent the distance between different frequencies.
- Image/Video - direct literal representations of three dimensional real world objects. This includes much of the fine arts such as paintings, sculptures, and drawings. The video element of this also includes moving images. The analog format e.g. the painting, maintains the physical relationships of distance, depth and colour.
- Audiovisual – consisting of images and sounds combined to convey motion and movement.

These categories have in one combination or another formed the basic structure of the subject matter of copyright and related rights law in different countries and are encompassed under the concept of 'artistic and literary works'. These categories are also the basic background for policymaking in digital and internet content. The technical definitions are less important than understanding that each of the categories required a different means for fixing representations, using different physical forms and attempting to directly replicate or analogize the 'work'. Thus, music was recorded on LPs, novels were published on paper, and photographs were captured on film. Different devices were required to view each subject matter. Copyright policy has been based on these differences and has treated each format differently. Thus, the protection for sound recordings in some countries is different compared to the protection for books.[11]

---

[10] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 58 (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[11] Title 17 of the United States Code concerned with Copyright, protects literary and artistic works under Chapter 1. Sound recording have a different scope from other works as described in 17 USC Section 114.

In contrast, digital and internet content exhibits a unity of format that entirely transforms the relationship between different forms of content and the way in which the categories understood by copyright law function. Rather than analogizing, digital and internet content translates and transforms the 'work' such that the manner in which it is represented in no way resembles any of the actual physical relationships of sound, text or images. Digital and internet content encompasses ***all*** information that has been digitized, meaning that it can ***all*** be manipulated by a computer microprocessor, a tool that has become ubiquitous in our modern age, present in almost all electronic devices (e.g. mobile phones, televisions, computers), and can be distributed through the internet and other digital transmission means. Digital and internet content encompasses literary and artistic works that have been transformed from analog to digital, or were originally created as digital works. It also encompasses new forms of content, such as software, and multimedia products such as web pages.

The power of digital and internet content lies in the maturation of two processes: 'digitization' and the growth of the Internet.

III.1.1 What is Digitization?

Digitization means turning a representation or recording into a format which can be read, viewed or represented in some manner in a computer microprocessor. At their core, computer microprocessors are binary systems, operating through electronic logic gates which are either 'on', allowing electric current to flow (a state labelled '1') or 'off' blocking the flow of electric current (a state labelled '0'). Any material that one wishes to manipulate or represent in the computer microprocessor must be converted into this binary language. The following example simplifies the issue by a significant factor and omits some elements, but the basic explanation should provide some understanding of how the process works.

The units of binary language (the '0' or '1') can be thought of as 'bits'. They can be placed in sequences such as four bits which consist of a four unit set of zeros and ones e.g. 0011 or 0101 or 8 bits which consist of an 8 unit set of zeroes and ones e.g. 10101100, or 01101101. The term 'bytes' has generally come to describe an 8-bit sequence and is used in reference to "kilobytes" or "megabytes". Digitization is a mathematical operation enabled by mathematics in base 2, using just the numbers 0 and 1. This is in contrast to familiar mathematics conducted in base 10, which uses 10 numbers (i.e. 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9). For example, in digitizing an image, a value is assigned to each colour on the spectrum (e.g. red is 0001, green 1001, and blue is 1000). The image is divided into a very fine grid, with each square called a pixel. Each pixel contains a certain colour and is then represented as some combination of the basic colours on the spectrum, which is represented as a binary addition (or other binary mathematical operation, e.g. binary addition: 0001 + 1001 + 1000). In addition, some binary information is also added to note the location of the pixel on the grid. Once that is done each pixel is a binary number containing colour and location information and can be stored anywhere on a computer microprocessor.

What is seen on a computer screen (or any other digital device) is the result of layers of interpretive software (itself a series of zeroes and ones consisting of instructions to the microprocessor) that reconstructs bits into something that humans can see, read or hear, through a computer monitor or speakers.

A digital representation can be disassembled and reassembled in an almost infinite number of combinations, and each discrete bit manipulated individually (and safely), separate from all the other bits that make up the representation. The ability to manipulate, alter and transmit works at this micro-level has proven to be powerful and is at the core of the digital revolution that is transforming markets for creative goods and services.

However, the digital and internet content revolution does not really lie in the ability to turn words, images or sounds into zeroes and ones; the mathematical ability to carry out that process has been part of human capability since the early part of the twentieth century. The real basis of the digital and internet content revolution lies in the increased memory capacity of computer microprocessor devices (the ability to store extremely large amounts of zeroes and ones) and the development of software to manage and reconstruct the enormous amount of zeroes and ones into text, images, and sounds which can be manipulated on a computing device and transmitted across a computer network. Digitization has, therefore, been accompanied by a multitude of computer programmes (software) to create, manage and distribute digital and internet content.[12]

III.1.2 The Explosive Growth of the Internet

One result of the software development that accompanied the digitization revolution is the explosive growth of the internet. Compression[13] and data management software, as well as more efficient fibre-optic cables[14] have increased the ability of the internet to transmit larger and larger amounts of data, at faster and faster speeds. Now, the potential exists for any work (text, music, film) to be distributed worldwide, essentially instantaneously, without degradation and at an insignificant cost.[15] As Alan Story puts it "providing internet access to already formatted materials or widening existing access to new users has *zero marginal costs* for information distributors (unlike, for example, the paper and printing costs of hard-copy materials)."[16]

The internet has, in effect, become a 'datacasting' (data broadcasting) system, regardless of the original format or representation of the data.[17] The key to this process is the fact that transmitting data over the internet does not destroy the data in the sending device. Individuals can produce, share and distribute content without loss to themselves of the original content.

These two developments, digitization and the internet, have transformed the separate strands of analog content into the single basic format of digital and internet content. This has major implications for the reproduction and distribution of content. It also presents an opening up of a closed economic system, shifting control of reproduction and distribution channels from centralized systems with a few actors in each market, to decentralized systems with millions of actors. Content that once may never have had the opportunity to be produced or distributed can now find its audience and niche, anywhere in the world. Content that was limited to only one country can now cross borders effortlessly. Content that was highly expensive may now be accessible without cost. In this newly opened up process, opportunities for increased access abound.

---

[12] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 5 (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[13] See Glossary

[14] See Glossary

[15] This, of course, presumes that the costs of accessing and using the internet are on a par with telephone costs, or even cheaper.

[16] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 37 (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[17] See C Correa "Implications of Intellectual Property Rights for the Access to and Use of Information Technologies in Developing Countries" Discussion Paper 2000/2 UNU-INTECH, International Workshop on the Information Revolution and Economic and Social Exclusion in Developing Countries, Maastricht, 23-25 October 1996, at 34. (Available at http://www.intech.unu.edu/publications/discussion-papers/2000-2d.pdf last visited February 13, 2007)

III.2 The Uses of Digital and Internet Content

The potential uses and consequences of digital and internet content for development run extremely broad and deep. The opportunities for the general public especially for access to educational and technical information materials are highly significant. In this regard it is important that some key tools and uses are outlined. The following section describes tools with the potential to enable development, especially for educational access.

III.2.1 Digital Books

Textbooks are a subset of the larger book publishing market which has undergone a significant shift in the way in which texts are produced. Almost all texts are now created on word processors on computers and emailed between authors, their colleagues and their publishers. Before a text is ever printed in paper form it now exists as an electronic document, formatted and ready to print. The emailing and internet transmission or downloading of such texts addresses a major bottleneck of distribution to developing countries and, where access exists, can transform the costs of delivery and distribution of texts.

However, there is a significant portion of published books that have never been digitized, including many seminal works of literature and science. There are also a significant number of out of print books that are simply not worth the time and money for publishers to reprint or digitize. Many organizations are working to remedy this, especially where these texts are no longer under copyright protection. A major project is Project Gutenberg[18] which is a collaborative project to digitize texts that are in the public domain. It contains over 20 000 high quality free texts. They also carry translations of these texts. Where texts which form part of the basic reading of educational courses are available electronically, educators and students can access, download and read them without the added costs of purchasing books. While electronic access has a short term cost, the ability to access unlimited amounts of reading material without purchase may pay off over the long term. One example is the fact that students are able to study the works of Shakespeare, George Bernard Shaw, and Charles Dickens, some of the set texts necessary for completion of the 2007 English Literature International General Certificate of Secondary Education (IGCSE)[19] exams, which many secondary school students in the English-speaking world have to take to complete their secondary education.

The primary advantage of digital books is that they present a real opportunity for increased access to knowledge and also their ease of distribution in comparison to hardcopy texts. It is important to note that this advantage, while not necessarily lost, is somewhat reduced by the fact of printing out the text and making photocopies or using printing presses. Since such photocopying and/or reprographic technology is expensive in many developing countries, the cost of copies may not necessarily always exceed the cost of some books, especially for cheap paperback versions of public domain texts. However, in many cases, especially that of technical and scientific texts at university level, the costs of electronic downloads and printing may still remain significantly below the costs of buying texts, especially for those texts still under copyright protection.[20] A key limitation is also the fact that many electronic journals are available only as paid subscriptions.

---

[18] www.gutenberg.org

[19] http://www.cie.org.uk/CIE/WebSite/UCLESData/Documents/IGCSE/Syllabus%202007/0486%20Set%20Texts%20-%202007.pdf

[20] See A Rens, A Prabhala and D Kawooya 'Intellectual Property, Education, and Access to Knowledge in Southern Africa' (2006) ICTSD Regional Research Paper Southern and Eastern Africa at 30. (Available at http://www.iprsonline.org/unctadictsd/docs/06%2005%2031%20tralac%20amended-pdf.pdf last visited February 13, 2007), describing the demand side of the equation of why students feel the need to photocopy their assigned texts.

III.2.2 Open Access Online Scholarship Repositories

A significant factor for developing country educators and scholars is the growth of open access scholarship repositories into which more and more scholars are placing their work. These repositories, while not necessarily peer-reviewed, also include papers published elsewhere in peer-reviewed journals. Works can be uploaded and downloaded fairly easily for free and can enable two-way traffic by allowing scholars from the South to place their works in such repositories and by enabling access to the most up to date writings in their field. In this way the commons of scholarship can grow and such articles and writing can provide a free basis on which developing country scholars and educators can build reading lists, based on South scholarship as well as scholarship from developed countries.

A good example of such repositories is the Social Science Research Network[21] which is free to access for those who register with internet addresses in developing countries. The site allows individuals to register and to deposit their papers and enables search of the database by subject or by author. Available subjects range from Law to Political Science and Economics. Such repositories may not necessarily replace the filtering service that peer-reviewed journals (online and hardcopy) provide, but they enable access to pre-publication (and in many cases post-publication) versions of many articles that do end up in such journals. Combined with free online access to abstracts of articles (provided by many subscription journals) the world of research is opened up for scholars in developing countries. A major advantage of such repositories is that they provide a clear incentive for scholars to deposit their works so that they can not only have their work placed in prestigious journals, but also have that work disseminated and cited as widely as possible.

III.2.3 Electronic Journals

Traditional journals provide a key service to scholars. They provide a peer review process that filters and evaluates work while also enabling wide distribution of the works that they publish. In return for the rights to own and publish articles, the owners of journals provide the channels of distribution and the imprimatur of quality. The major market for such journals is other authors and libraries and the cost of production of hard copies has generally been fairly high because of the failure to benefit from economies of scale (too small a market). The ability to distribute journals electronically has meant that the production and distribution costs of electronic journals have dropped by a significant factor, as what was previously hardcopy can now be produced and delivered in electronic form to libraries and authors. This also enables journal owners to deliver their journals to markets in developing countries that were previously not worth the cost of servicing. The potential for increased access has not yet been delivered however, because the production savings have not been passed on to users. The reasons for this will be discussed in section IV.1 on the rights holder response to the digital and internet content problem. For now, subscription journals, while having the potential to increase access, are not yet a viable tool. There are examples of formerly subscription only journals becoming free-to-access journals e.g. the law journals of several law schools in the United States such as Duke University. Others allow free access to materials in their archives that are older than six months, such as the New England Journal of Medicine, one of the most prestigious medical journals in the United States.

However, the rise of free electronic journals provides an alternative mode of access, while maintaining the crucial peer review and filtering mechanism. Taking advantage of the freeing up of distribution channels and the lowering of production costs, scholars in different subject matter areas are collaborating to produce free electronic journals that provide the advantage of peer review without the subscription costs. While not always equal in prestige to some subscription journals, such free electronic journals can provide equal value in terms of filtering and distribution. This is a godsend for librarians who can build their journal collections without having to purchase expensive journal subscriptions. An initiative that aims to take advantage of these open access resources is the Open J-

[21] www.ssrn.com

Gate project (www.openj-gate.com) launched by Bangalore-based Informatics.[22] It indexes and allows searches of a whole range of open-access journals and is free to access from anywhere in the world. It enables access to the full-text of articles, some in PDF format (the ADOBE PDF reader is free to download from the internet) and some in HTML web format. Most usefully, the site allows searching by journal as well as by keyword. Such 'meta'-sites provide a crucial service by collecting together the widely dispersed resources available on the internet and making them available in a single place. Another example of such a meta-site is the Directory of Open Access Journals (www.doaj.org).[23]

III.2.4 Online Curricular Materials

Open Courseware programmes such as Open Courseware at the Massachusetts Institute of Technology[24] also provide courses and teaching materials available for free over the internet which can be accessed by developing countries' institutions. These programmes provide syllabi, teaching tools, transcripts and videos of lectures, some of them delivered by the leading scholars in their fields. Such resources are especially useful in the natural sciences where access to the most up-to-date concepts, methods and approaches has historically been difficult for educators and students living on the global periphery. These resources are available both at the tertiary and secondary school levels. For example, a teacher of mathematics in a developing country will be able to download a syllabus, problem sets and answers, exercises, analysis, explanations and lectures and use them in his or her own lessons.

The major weakness of such Open Courseware systems however, is that many (especially in the social sciences) rely on copyrighted texts to teach their material, and are therefore of limited use to developing countries where such texts cost prohibitive sums. However, in combination with free online text providers such as Project Gutenberg[25], these programmes may enable sharing of expertise at unprecedented levels and may allow direct use of such materials by students and teachers in developing countries.

III.2.5 Online collaborative and interactive fora

Interactive forums provide a useful way to establish a dialogue on issues of concern to small or large groups of like-minded individuals. These are especially useful with respect to exchange and commentary on scientific and scholarly works. Authors may take comments and suggestions from such fora and include them in their own works, as part of a sharing community[26], and developing country individuals can find a way to share with each other and with colleagues in developed and developing countries, their data, and their information. Individuals from developing countries can participate and contribute their material to such discussions in several areas on the internet.

Other such fora are the discussion lists and threads attached to specific webpages which enable real back and forth communication between people reacting to general issues on a site or to a specific web posting. While there are other web-based discussion fora, the most recent developments are so-called web logs ("blogs"), which resemble on-line diaries. These also serve as tools for individuals to serve a community by following and presenting information updated on a regular basis. These are

---

[22] A Ratnakar "World's Largest Open Access E-Journals Portal Launched" (2006), 90 Current Science 741, 751

[23] Further sites can be accessed from the website of Electronic Information for Libraries at http://www.eifl.net/services/services_journals.html

[24] See http://ocw.mit.edu/index.html. Courses range from Anthropology to Chemical Engineering and are available at undergraduate and graduate level.

[25] See www.gutenberg.org

[26] See e.g. Y Benkler, *The Wealth of Networks* (Yale University Press New Haven 2006) available at http://www.benkler.org/wealth_of_networks/index.php/Main_Page last visited February 13, 2007)

almost always accompanied by discussion fora and threads to comment on the postings to the blog. The particular advantage of blogs is that they allow the continuous updating of a website without having any expertise in the programming languages for constructing websites. Thus any individual can create a blog and state their views, upload documents and pictures and allow others to either post or comment in discussions about the blog. Several websites enable free blogs to be set up by any person, one example being www.blogger.com. Some search engines, such as Google[27] enable searching for blogs on specific topics.

III.2.6 Search Engines

The ability to seek out and identify relevant information on the internet has been a crucial innovation. It has relied largely on the ability of search companies such as Google and Yahoo (as well as many regional and local companies e.g. Ananzi in South Africa[28]) to send out automated systems that view web pages, record the data and address, and categorize them, and make such links available to users. These searches may also make copies that allow a user to find a page by searching for terms used in the web page. Developing country users may be more reliant on these search engines than users in developed countries simply because they do not have access to the same marketing information from newspapers, magazines and television that make it possible to type in a direct website address. Web searching is crucial for development. For example, the development of such search engines in indigenous languages (e.g. www.baidu.cn in Chinese) allows individuals to find websites already written in that language and increases usability. The next logical step, the copying and (preferably automatic) translation of copies of websites to allow them to be searched in the language used, is a way to increase access for developing countries.

III.2.7 Free/Libre Open Source Software

Free/Libre Open Source Software (FLOSS) is software that is essentially ***free to use***, modify and implement. This is in contrast to proprietary software which is not free to use and whose information is protected by copyright or other intellectual property rights.[29] Such proprietary software includes, for example, the Microsoft Windows operating system, and associated Microsoft Office word processing and business software.

FLOSS relies on open networks of programmers and developers. One person creates a programme that others can alter, share and improve. As a development model, it is robust, fast and effective at finding flexible solutions to programming problems that single, goal-directed teams working in secret may not be able to. To accomplish the task of open development and dissemination, FLOSS depends on copyright to enforce a licensing structure that maintains the open nature of the software. There are several kinds of licences available under the FLOSS concept, the most common being the GNU General Public Licence (GPL), used by over 66% of projects.[30] The conditions of the licence primarily affect the user when it is distributed to another user. Among the key provisions of distributing GPL software are:

- the distributor of a GPL programme must also make available the source code to the recipient;

[27] http://blogsearch.google.com/?ie=UTF-8&oe=UTF-8&hl=en&tab=wb&q=
[28] www.ananzi.co.za
[29] The section below is an example of how FLOSS can work, outside of software. The section is a modified version of the International Open Source Network's Primer on FLOSS, based on the Open Content principle at http://www.iosn.net/foss-primers, which is free to use, modify, and distribute, and only requires acknowledgement.
[30] Ghosh et al. "Economic Impact of FLOSS on innovation and competitiveness of the EU ICT sector" UNU-MERIT Study Commissioned by the European Commission, November 2006, at 86. (Available at http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf last visited February 13, 2007)

- any changes made to a GPL programme by the distributor must also be licensed under the GPL;
- distributors may not place any non-GPL restrictions upon the users they distribute the GPL programme to; and
- recipients of GPL software are granted the same rights to copy, modify, and distribute the software as the original distributor.

Any person who contravenes the licence may therefore, be sued under both contract and copyright law. Thus, the initial programmer has the assurance that, once something is released as FLOSS, it will remain so permanently. It is not possible to add additional licensing to strip away a user's right to redistribute or modify the programme. A commercial software company cannot take a GPL programme, modify it and then sell it under a different, proprietary licence. The open nature of FLOSS makes it ideal for developing countries that need a cheap, reliable and cost-effective way to move into ICTs and software development. It is also a growing part of the information and communication technology and service economy in developed countries. Ghosh notes that, in the EU, "FLOSS-related services could reach a 32% share of all IT services by 2010, and the FLOSS-related share of the economy could reach 4% of European GDP by 2010."[31] The FLOSS model has been adopted and is now being driven by industry.[32] It is a viable economic and business model focused on providing services rather than selling products, although that is also a possibility under this model.

There are now many high quality products available for all applications, including word processors, spreadsheets and internet applications, more than sufficient to meet the needs of most individuals and students in developing countries.[33] While the initial start costs for installing free software can be high, largely because of personnel costs to ensure knowledgeable purchasing, installation and maintenance, the ability to modify, localize and install updates without further cost is a real advantage.[34] For individuals, free software is evidently better, simply because of the cost issue. For students and educators, the advantages lie in being both able to access and use, for free, the word processing and other educational software available, as well as the ability to make changes and begin to train in some of the elementary methods of programming.

Amongst developing countries, the major mid-size economies of Brazil and India lead in the adoption and use of FLOSS. Nevertheless, use of FLOSS desktop applications remains low, though growing.[35] In developing countries, FLOSS adoption and use is driven by government initiatives.[36] For example, Open Office is used in 91% of Brazilian government offices, 73% in India, and 58% in Malaysia.[37]

---

[31] Ghosh et al. "Economic Impact of FLOSS on innovation and competitiveness of the EU ICT sector" UNU-MERIT Study Commissioned by the European Commission, November 2006, at 10. (Available at http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf last visited February 13, 2007)
[32] Id. at 17
[33] See, for example the OpenOffice suite of applications at http://www.openoffice.org/.
[34] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002), at 23. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)
[35] See the example of Brazil in Ghosh et al. "Economic Impact of FLOSS on innovation and competitiveness of the EU ICT sector" UNU-MERIT Study Commissioned by the European Commission, November 2006, at 24. (Available at http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf last visited February 13, 2007)
[36] Id. at 25
[37] Id. at 31

Other examples of free software are the free web browser Firefox from the Mozilla Foundation[38], or the email manager Thunderbird (also from the Mozilla Foundation). The Linux operating system[39], which underlies much of the FLOSS application field, is also available in several different versions for different purposes.

III.2.8 Peer to Peer (P2P) distribution networks

The major element[40] of the Peer to Peer definition describes a distribution process where each individual user enables others to have access to materials on their computer or computer network, search for what they want and make copies for themselves. Normally, one individual uploads an object to another with the condition that such access is reciprocal. This is a powerful distribution mechanism that bypasses the traditional media channels and enables one object to be immediately available to many users, the moment someone puts it on the network. Examples of such networks are Kazaa[41] (music), Flickr[42] (photographs), BitTorrent[43] (all kinds of content including software).

Some have centralized databases which hold information about where certain files can be found and enable free transfers.[44] Other programmes simply enable one user to search another's computer for material and to transfer it to one's own computer. Such programmes usually have two aspects: the ability to search a network of computers for specific information; and the ability to transfer that file once found from someone else's computer to your own. To search properly, all the information generally needs to be categorized in the same format on each computer and it needs to be on a network.

The real innovation of these programmes is to establish such a network related specifically to each P2P programme, thus connecting up users in the first place, and then make it possible for non-technical users to transfer files from another person's computer, or server, to their own. These P2P networks are powerful tools for sharing information, tools and content. P2P transfers now constitute almost half of all global internet traffic.[45]

The opportunity for developing countries, and individuals and organisations in individual countries is immense. In the first place, P2P can enable access to materials that are available in other countries but have not been made available in the developing country. Many major content providers set up limited distribution mechanisms in the developing world due to market size and profit considerations. Accessing cultural goods becomes an expensive process as there are no direct ways to acquire such goods and they may therefore be prohibitively expensive in developing countries. Peer to peer sharing will enable those developing country individuals and institutions with internet access to connect and search those P2P networks. While the advantages for cultural commodities are clear, the

---

[38] www.mozilla.org
[39] http://www.linux.org/dist/index.html
[40] The other is Peer to Peer production, sometimes called distributed production. An individual or a company saves costs on the generation of complex knowledge or technical goods by placing the problem on the network and separating it into smaller issues. Each member of the network works on whatever element of the problem that they choose, feeding their results back to the larger network. Such approaches have had some spectacular results, as in the explosive development of Open Source software products such as the FireFox web browser.
[41] www.kazaa.com
[42] www.flickr.com
[43] www.bittorrent.com
[44] M Heins "The Progress of Science and Useful Arts: Why Copyright Today Threatens Intellectual Freedom" The Free Expression Policy Project, New York, NY 10001, (2003) at 35. (Available at http://www.fepproject.org/policyreports/WillFairUseSurvive.pdf last visited February 13, 2007)
[45] Ghosh et al. "Economic Impact of FLOSS on innovation and competitiveness of the EU ICT sector" UNU-MERIT Study Commissioned by the European Commission, November 2006, at 44. (Available at http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf last visited February 13, 2007)

advantages with respect to scientific research, health information, books, and other materials are even stronger.

The ability to search many sub-networks for materials of particular concern to developing countries would be invaluable, especially for technology and knowledge transfer. In addition, by making developing country materials available on such networks, these countries can encourage and enable diverse and varied exchanges among South-South and North-South, eliminating the distribution blockade that exists because of the dominance of the major distribution channels by major content distributors from developed countries.

IV. THE POLICY PROBLEM OF DIGITAL AND INTERNET CONTENT

The basic problem posed by digital and internet content is that of copyright. Digital and internet content has fundamentally changed the nature of the subject matter protected by copyright and has opened up whole new areas of potential profit-making. The power of digital technology has transformed the way creators work and how authors and publishers deliver works. As Correa notes "it has blurred the lines between copying and reading, sale and reuse, performance and viewing of a work."[46] The question that must be answered by policymakers in this arena is in what ways old copyright concepts can, or should, be extended into the digital arena, and how best to serve the public interest in ensuring incentives for production and increasing access to knowledge.

In an environment of lowered production costs, zero marginal costs for reproduction, and zero marginal costs for distribution, profit-making opportunities increase exponentially for content owners, while costs for access should, theoretically, decrease, or approach zero, for consumers. These two trends appear to be diametrically opposed in the sense that such increased profit-making for copyright holders can only take place in an environment where levels of paid access for consumers either remain static or where the payment model is extended into areas previously reserved to free uses. This is in fact the position that has been taken by the major content industries in developed countries and it is in this context that their push for further copyright agreements at the international level, and further domestic legislation should be seen.

The major developed country content industries argue that their costs have remained static while the costs of access have been reduced, and that this is the cause of their falling profit margins.[47] This argument fails to reflect the real advantages of cost and productivity savings that that they have already gained, and stand to gain, from the use of digital and internet technologies, both in production, and in distribution. The overall growth of these industries (especially if one includes the plethora of small businesses, independents, and start-ups) has not suffered at all and, in the United States, economic growth of this sector (as a proportion of GDP between 1997 and 2002) has outpaced that of most other economic sectors.[48] This is in the period in which there has been the most growth in the use of digital and internet content and technologies by consumers and producers. In the period 1991-2002, the average growth in sales from the United States to the rest of the world was 9.45%[49], a more than respectable economic performance for industries that argue that they are suffering from piracy through digital and internet content.

Beyond the financial and structural issues, digital and internet content poses problems for basic copyright concepts, especially for the core protection that copyright provides: the right of reproduction. Digital and internet content affects reproduction in two ways: quality and quantity.

IV.1 The Problem of Quality

Historically, most reproduction technologies for digital content resulted in a degradation of quality as compared to the original. For example, photocopiers were for a long time poor reproducers of text and

---

[46] CM Correa 'Fair Use in the Digital Era' (2002) 33 IIC 570, 570 (Available at http://webworld.unesco.org/infoethics2000/documents/paper_correa.rtf last visited February 13, 2007)

[47] S Siwek "Copyright Industries in the US Economy: The 2004 Report" (International Intellectual Property Alliance, Washington DC 2004) at 10. (Available at http://www.iipa.com/pdf/2004_SIWEK_FULL.pdf last visited February 13, 2007)

[48] S Siwek at 5

[49] Id. at 10

images. In addition, the act of copying in many cases degraded the original itself because of the necessity of physically deforming the original on a tape player or having to expose it to bright light from a photocopier. The only quality reproduction technologies were the ones that had produced the original, a printing press, in the case of text. This made reproduction a very expensive process that required significant investment. It also meant that the only real concern for rights holders was not copies by private citizens but by competitors (and possibly other large commercial actors). This was the same in the case of music, where magnetic tapes tended to reproduce less well from each copy.

Digital and internet content transforms the nature of copying. Each copy from an original can be as good as the original.[50] However, that is not the real problem. The real problem is that each copy can itself be copied an infinite number of times without a loss of quality in the copies while the original retains its quality. Reproduction becomes "viral" in that copies can be passed on from one person to another easily and almost without cost, reaching across chains of personal networks almost instantaneously. In addition, copying technologies have not only improved in quality, but have become embedded in the operation of other technologies such that reproduction is a basic function of every single computer programme and every computer microprocessor.

IV.2 The Problem of Quantity

In music and audiovisual content, digital or optical discs (CDs and DVDs) have become the dominant form of distribution. Computer processors and the advent of so-called personal 'burners' have allowed individuals, as well as larger commercial concerns, to make physical copies that can be sold to people whose primary means of listening and viewing such content does not involve accessing it over a network or through a computer. Since this involves the vast majority of people in developing countries, optical disc reproduction in developing countries is a major target of action by the music and audiovisual content industries, especially in Asia and Latin America. While the majority of users now access such material in optical disc form, most commentators agree that the spread of ICTs, and the internet, both in developed and developing countries, will result in massive migration of users from the physical purchase of content to access through the internet, with the content stored digitally in whichever device they use for accessing the material.[51] In many countries this is already beginning to happen with music, as mobile phones and other portable devices begin to take on multiple functions such as music and video playback.

Some countries also provide a right of distribution[52] separate from the right of reproduction. This is not a right required by the Berne Convention but it has historically served to protect markets for the major commercial content distributors so as to provide an incentive for them to distribute such material. It effectively allows a rights holder to control and seek remuneration for the distribution of the original. It allows a creator to sell the right of reproduction to one party and the right of distribution to another, separating out the functions. Thus, a film company in the United States can retain the right of reproduction in the United States, but then sell the right of distribution separately to one company in Brazil, and to another company in Malaysia. This right is premised on the concept of separating out reproduction and distribution and the idea that once a copy is distributed, the person who distributed no longer has the copy in possession. With digital and internet content, the act of

[50] With the caveat that there is some signal loss in the transition from analog to digital but largely at the extremes of high and low frequencies. Compression techniques tend to remove sounds that are not generally audible to the human ear.

[51] See e.g. Pfanner, E. "Digital Music up 80% but Shy of Lost revenue" January 18, 2007, New York Times, pointing to a shift in sales from CDs to online music.

[52] See e.g. Article 4 of The European Copyright Directive, Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society (Available at http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32001L0029&model=guichett last visited February 13, 2007).

sending a copy to another person does not destroy the copy in the possession of the sender. In a world where a sender retains a copy while a copy is sent, means that any person with an internet connection can potentially become a major distributor by sending copies as many times as possible over an indefinite period of time to every person connected to the internet. Those firms that make their profit primarily as distributors rather than creators or producers of content find themselves in competition not just with their traditional competitors, but with every single person who wants to send or share copies of the work that they own. Nevertheless, the very technologies that present such a challenge to distributors are also the very technologies that have reduced their costs of distribution by massive amounts, provided that they also take advantage of the opportunity of digital distribution, and the first mover advantage that their private deals with producer companies provide them.

V. THE RIGHTS-HOLDER POLICY RESPONSE TO DIGITAL AND INTERNET CONTENT AND ITS LIMITATIONS

The speed at which digital and internet content has challenged the business models of the major content industries as well as the access opportunities have drawn various responses as both rights holders and users struggle to define their place in this new territory. For the moment, much of the battle has taken place within developed countries, although a significant portion of activity has also shifted to multilateral fora. In examining these responses and their limitations, developing country policymakers may be able to avoid the pitfalls that some developed countries have already stumbled into. This section also hopes to provide a sense of the universe of policy responses and make some suggestions as to which ones may be more appropriate for developing countries.

The major content industries have largely responded to digital and internet content in a negative manner, viewing the ease of access to digital and internet content as a threat to their main business models. They have responded in four general ways:

- selectively extending copyright principles to digital and internet content;
- seeking the expansion of copyright and related rights subject matter;
- creating and enforcing Technological Protection Measures for digital works; and
- seeking new international norm-setting processes on digital and internet content such as the WIPO Copyright Treaty, the WIPO Performers and Phonograms Treaty, and the proposed WIPO Broadcasting Treaty.

The rights holder response has generally been to seek to bring all digital and internet content under the protection of copyright law and add additional restrictions which threaten to restrain or restrict free legal access to, and use of, materials that are necessary for development. The major content industries in developed countries (publishing, sound recording, film, television, and software) have been responding to what they perceive as both the threat to their business models and the opportunity for greater profit and control, posed by digital and internet content. As Menell notes, this has resulted in the fact that "[more] pages of copyright law have been added to the U.S. Code in the past decade than in the prior 200 years of the republic, dating back to the first copyright act adopted in 1790."[53] The importance of digital and internet content to these industries cannot be over-emphasized. The sheer amount of activity in the international arena[54] should serve as fair warning that developing countries ignore, or dismiss such issues at their peril.

V.1 Selective extension of copyright principles to digital and internet content

While the major developed country content industries have sought to extend exclusive copyright principles to digital and internet content, they have also excluded or diminished the application of traditional public interest elements of copyright law. In particular, the actions of developed country industries have affected the application and scope of limitations and exceptions to copyright and

[53] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 4 (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[54] As evinced by the TRIPS Agreement, the WIPO Copyright Treaty, the WIPO Performers and Phonograms Treaty, the proposed WIPO Broadcasting Treaty, as well as the various bilateral and regional Free Trade Agreement between the US and developing countries; and the EU and developing countries.

related rights. Sometimes described as fair use or fair dealing in common law legal systems, the traditional exceptions to intellectual property rights in literary and artistic works generally include:

- reproduction and use for private use purposes;
- reproduction and use for educational, research or study purposes;
- reproduction and use for library purposes (e.g. archival copies, lending of multiple copies, reproduction for teachers);
- news reporting (e.g. quotations, excerpts, and commentary).

These limitations and exceptions have been applied in diverse ways, although most countries have left some flexibility to accommodate new technologies. This leaves a significant amount of room for developing countries to innovate and apply development-appropriate policies. However, major content industries in developed countries oppose such flexibility or use of exceptions and limitations. Their basic argument is in two parts. The first is based on the idea that limitations and exceptions to copyright only existed in those areas where the rights holders could not cost effectively enforce their rights. Since the digital environment may enable greater control and ability to enforce rights e.g. against private use, such exceptions should no longer apply as they only existed because of a market failure.[55] In this scenario, we are asked to presume that the rights holder has always had a right to every iota of potential profit that can be made from their work. This argument fails in light of the basic purposes of copyright. Copyright is meant to provide only a ***sufficient*** incentive to creators to produce and disseminate their works, for the purposes of increasing the amount of work available to society in general. It is not aimed at providing the highest possible incentive or the highest possible reward. It has always been a limited grant whose right to profit has always been balanced against the larger public interest.

The second part of the argument is that digital and internet content has changed the nature of the relationship between creators and users by making reproduction and distribution infinitely easier, thus weakening rights holder incentives. This disrupts the traditional balance between rights holders and users and therefore stricter controls on digital and internet content are necessary to restore that balance.[56] However, such an argument rests on the premise that the pre-existing balance between rights holders and users was both correct and desirable. At least for populations in developing countries, it is clear that the balance has largely been in favour of rights holders from developed countries. Some estimates of royalty payments suggest that there is a net outflow of funds from developing to developed countries.[57]

The very fact that digital and internet content has disrupted business models and affected the basis for copyright law suggests that a new balance needs to, and can, be found, one that reflects the reality of production costs, of profit margins, and of the real need for access to knowledge for marginalized populations.

---

[55] C Correa "Implications of Intellectual Property Rights for the Access to and Use of Information technologies in Developing Countries" UNU/INTECH Discussion Paper 2000-2, at 37 citing the European Commission. (Available at http://www.intech.unu.edu/publications/discussion-papers/2000-2d.pdf last visited February 13, 2007)

[56] See J Ginsburg "Legal Protection of Technological Measures Protecting Works of Authorship, International Obligations and the US Experience" Columbia Law School Public Law and Legal Theory Working Paper Group, Paper No. 05-93, 2005, at 3. (Available at http://ssrn.com/abstract=785945 last visited February 13, 2007)

[57] Story, A., et al (eds.) "The Copy/South Dossier: Issues in the economics, politics and ideology of copyright in the global South" Copy/South Research Group May 2006, at 33 (available at www.copysouth.org) *citing* N Chomsky, "Notes on NAFTA", in K Dawkins *NAFTA: The New Rules of Corporate Conquest* (Westfield, NJ: Open Magazine Pamphlet Series, 1993) at 3.

The nature of the creative process, iterative and inspirational, suggests that there has always been a legitimate amount of borrowing that forms part of the incentive to create.[58] Thus the incentive system must have an input as well as an output. In addition, any policy change has to be premised on whether or not the incentive to publish and disseminate is truly harmed in a significant fashion. To simply assume that potential loss of theoretical profits would lead to a loss of the incentive to create and disseminate is insufficient as a basis for policy.

Nevertheless, a proper balance must still be found between the right of public access, which is central to the rationale for copyright protection, and the protection of the incentive to produce and disseminate original work. This approach must also take into account market realities. The truth remains that without special access mechanisms or broad exceptions, populations in developing countries present negligible markets for developed country goods. There are no potential sales to be had where literacy is low and costs are beyond the reach of all but a small elite. The fact that students in a developing country can download an article from a database or copy a piece of software does not represent a lost sale, since such a sale would never have taken place to begin with.[59] Allowing such access can only serve to create a larger market in the future by training and educating larger portions of the population who may therefore earn more and spend more of their discretionary income on cultural goods.

In addition, there are economic models that suggest that the attempt to increase copyright protection, and reduce exceptions and limitations, in the digital and public domains may be counter-productive for society and for individual producers.[60] Bessen and Maskin's model suggests that in an interactive and dynamic environment such as the internet, the best way to ensure optimum incentives for the production and dissemination of cultural goods may be less restrictive copyright protection for works.[61] This is premised on the realisation that much of what constitutes intellectual creations are collaborative and interactive processes rather than individuals working alone at a desk creating material out of thin air.[62] As a basic principle, such a realisation rings even more true in developing countries where folklore and other traditional production methods form the majority of what would be considered literary and artistic works. Such creation is sequential and dependent on previously produced material, whether copyright or public domain. Thus a certain level of imitation is necessary and should in fact be encouraged and enabled.[63] Whereas many in the copyright industries see the internet as a threat, in fact it may balance out the losses from increased copying with gains from easier production, distribution and marketing.[64] The harm to copyright holders from digital and internet content and technologies may in fact be illusory, and developing countries should consider that their own industries, producers and artists may benefit more from less restrictive levels of protection for digital and internet content than they would from following the highly restrictive models in developed countries.

---

[58] B Andersen, et al "Copyrights, Competition and Development: The Case of the Music Industry" Discussion Paper No. 145 January 2000 UNCTAD at11. (Available at http://www.unctad.org/en/docs/dp_145.en.pdf last visited February 13, 2007)

[59] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002), at 18. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[60] J Bessen & E Maskin 'Intellectual Property on the Internet: What's Wrong with Conventional Wisdom?' Presentation at Harvard Information Infrastructure Project Conference 'Internet Publishing and Beyond : the Economic of Digital Information and Intellectual Property' January, 1997 (Revised 2004) (Available at http://www.researchoninnovation.org/iippap2.pdf last visited February 13, 2007)

[61] Id. at 1

[62] Id. at 2

[63] Id.

[64] J Boyle 'The Second Enclosure Movement and the Construction of the Public Domain' (2003) 66 LAW AND CONTEMPORARY PROBLEMS 33, 43 (Available at http://www.law.duke.edu/pd/papers/boyle.pdf last visited February 13, 2007)

However, the playing field for innovative policy-making is undergoing radical shifts, and the following sections outline other responses from rights holders most relevant to developing country access to digital and internet content and technologies.

V.2 The Expansion of Intellectual Property Subject Matter

As new digital and internet content has come into being, and as previously unprofitable content becomes more worthwhile, developed country content industries have sought to extend protection to these new products and to strengthen intellectual protection for others.

V.2.1 Software: Copyright and Patent Protection

The protection of software has been extended into the copyright and patent fields. Under article 10 of TRIPS, member states are obliged to provide protection to computer programmes as literary and artistic works. In addition, some countries, such as the United States[65], have provided patent protection for software programmes.

The copyright protection extended to software now goes down to the basic level of the microprocessor, the ones and zeroes, (what is called the object or machine code). Thus, copyright protection for software now protects multiple representations of the code: the object code, the source code[66] and any other higher level embodiments of the code. Since object code is not human readable, it becomes very difficult to understand how the purpose of copyright dissemination is served if no one can read the code and gain knowledge and information from it. In particular, such a code can only be read if 'decompiled', that is, transformed by another computer programme back into a human-readable source code.

However, copyright only protects expression not functionality or ideas. Attempts by software companies to protect the manner in which the programmes functioned, beyond the expression, have generally (but not always) been rebuffed by courts in the United States.[67] Thus, even in the most permissive regulatory atmosphere for copyright, it seems that software could only find a very thin kind of protection, preventing only literal copying.[68] As the United States Supreme Court has noted, "the fact/expression dichotomy limits severely the scope of protection in fact-based works".[69] Thus, others have been able to write new programmes carrying out the same kinds of functions, or with similar structures dictated by the nature of the problem to be solved.[70] They have been able to reverse engineer the code by decompiling the object code (making it human readable) so that they can determine its function. Such possibilities have been crucial to the growth and success of the United States software market over the latter part of the 20th century. It should be noted however, that only a thin amount of copyright expression was necessary to enable the explosion in software innovation and development and, that access to, and reverse engineering of[71] the underlying code described by others, has been crucial to follow-on innovation and development in the industry. It is in this context that the extension of patent protection to software should be seen as an attempt to limit competition and stifle innovation

---

[65] See *In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981).

[66] See Glossary.

[67] For an examination of some of these cases see P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 5 (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[68] Id.

[69] Feist Publications, Inc. v. Rural Tel. Service Co. 499 U.S. 340, 350 (1991)

[70] Menell at 26

[71] Menell at 5

by a limited group of industry participants who are no longer innovators and now wish to consolidate their international market power.

The difficulties encountered by United States courts in applying copyright concepts to software resulted in a push to have software protected by patents. Now, dual protection for software is possible in the United States, covering all aspects of the code.[72] In addition, since companies in the United States are not required under patent law to disclose the entirety of the object or source code,[73] they also have trade secret protection for those elements that they withhold. Such multiple levels of protection have been crucial in allowing software monopolies to be created and perpetuated. Patents on software essentially close off all avenues of innovation along a particular path, except at the discretion of the owner. Given the investment usually involved in developing software, patent owners are unlikely to encourage innovation in an arena that might result in direct competitors for their own product. One can imagine what the situation would be like if Microsoft had, in its early stages, gained a patent on the basic concept of an operating system. They would have been able to block the development of rival operating systems, such as Apple OS or Linux, for 20 years or longer.

The main problem of copyright protection in software is the ability to restrict others from making derivative products of the expression. This has enabled operating system monopolies, such as the Microsoft Windows system, since software protection not only protects the ability to make derivative products, but also grants new copyright protection to the derivative product in and of itself.

The major problem with software patent protection is that in an industry such as the software industry, network effects form the basis for software development. Software cannot work alone. It must be compatible with other machines and with other programmes running on the machine. Software copyright and patent protection ensures that every single developer of software has to pay a premium to other developers with whom his or her product must work. Where one developer has managed to gain patent and copyright protection on an operating system, a software standard[74] or another primary programme or object, that developer can gain significant amounts of market power and possibly maintain it indefinitely, through the judicious application and renewal of dual copyright and patent protection.

The development policy problems of copyright or patent protection for software begin with the very logical realization that increased software protection in developing countries will result in lower usage of computers because most computers in developing countries run on unauthorized software.[75] Almost all users except for the wealthy will be priced out of the market. This is compounded by the fact that software makers do not price discriminate across countries. Thus, users in developing countries pay the same price (or sometimes more) than users in the United Kingdom or the United States, despite the clear differences in country incomes.[76] Whereas such prices may represent two weeks salary in the developed world, it is more likely to represent a year's salary in many developing countries. As long as the markets remain so small in developing countries, there will remain little incentive for software copyright owners to reduce prices or produce locally appropriate versions of their software.[77]

---

[72] There is, however, no obligation to extend patent protection to software in TRIPS.

[73] USPTO, *USPTO Manual of Patent Examination Procedure*, Section 2106: Patentable Subject Matter - Computer-Related Inventions, Part V.

[74] See Glossary

[75] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 14 (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[76] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 22 *citing* Reuters, 16 October 2001. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[77] Id. at 23, (*citing* anecdotal evidence from interview with a Ghanaian software developer) and at 26

The practice of licensing rather than outright sale of software also ensures that purchasers of such software are forced to contract away the rights that they would normally have under copyright to copy or use the product for educational, library or personal use.[78] Where such software is included in aid or training packages, it serves to lock developing countries into a cycle of further costs for maintenance, upgrades, and continuing licence fees for new versions of the software.[79] In any case, large-scale purchases for school systems of such licences in developing countries remain virtually impossible for the majority of developing countries because of the costs of paying a licence for installation and use on each and every computer on which such software will run.[80] This underlines the basic premise that Story has elaborated: increased software protection through copyright in developing countries is more likely to reduce access to ICTs and to retard development.[81]

Finally, the fact remains that software patents, as granted in the United States, do not seem to have had the effect of increasing innovation in the software sector.[82] Bessen and Hunt show that such patents were largely acquired by large hardware companies, rather than small software firms and that most large companies actually reduced their software research and development spending during the period in which they acquired the most patents. This suggests, Bessen and Maskin argue, that such patents were for innovation that would have occurred in any case, regardless of the availability of software patents.[83] It can be concluded that the software patent experiment in the United States has failed, at least as far as encouraging innovation. Where it has succeeded is in entrenching the existing business structure of the industry and enabled large companies to restrict competition from domestic and international software companies. Extension of software patents into developing countries can only serve to further restrict competition and the development of indigenous software industries that will certainly have to rely on rapid sequential innovation to grow.

V.2.2 Databases

Original databases have, historically, been protectable under article of 2(5) of the Berne Convention, but only where the elements of the databases are themselves literary and artistic works i.e. eligible copyright subject matter not mere facts; and the selection and arrangement of those elements is original. There is no requirement, under the Berne Convention, to protect databases that are collections of mere facts, no matter how original the selection and arrangement of those facts may be. It was only with the advent of the TRIPS Agreement (Article 10(2)) that an obligation to protect compilations of data was introduced, but with the requirement that such protection may only be conferred if the database is an "intellectual creation" by virtue of the selection and arrangement of the elements.

---

[78] For a further explanation see IPR Helpdesk "Software Copyright Licensing" available at http://www.ipr-helpdesk.org/docs/docs.EN/softwareCopyrightLicensing.html (last visited 12 February, 2007) (IPR Helpdesk is a project of the University of Alicante, Spain and partners, focused on EU law and "to assist potential and current contractors taking part in [European] Community funded research and technological development projects on intellectual property rights (IPR) issues.

[79] Story at 24

[80] Id. at 22

[81] Id.

[82] J Bessen & E Maskin 'Intellectual Property on the Internet: What's Wrong with Conventional Wisdom?' Presentation at Harvard Information Infrastructure Project Conference 'Internet Publishing and Beyond: the Economics of Digital Information and Intellectual Property' January, 1997 (Revised 2004) at 4. (Available at http://www.researchoninnovation.org/iippap2.pdf last visited 15 March 2006) *citing* J Bessen and R Hunt 'Sequential Innovation, Patents, And Imitation' (January 2000). MIT Dept. of Economics Working Paper No. 00-01 (2000) (revised 2003). (Available at SSRN: http://ssrn.com/abstract=206189 last visited 15 March 2006).

[83] J Bessen & E Maskin 'Intellectual Property on the Internet: What's Wrong with Conventional Wisdom?' Presentation at Harvard Information Infrastructure Project Conference 'Internet Publishing and Beyond: the Economics of Digital Information and Intellectual Property' January, 1997 (Revised 2004) at 5. (Available at http://www.researchoninnovation.org/iippap2.pdf last visited 15 March 2006) *citing* J Bessen and R Hunt 'Sequential Innovation, Patents, And Imitation' (January 2000). MIT Dept. of Economics Working Paper No. 00-01 (2000) (revised 2003). Available at SSRN: http://ssrn.com/abstract=206189 last visited 15 March 2006)

While it is not clear from the text whether 'intellectual creation' is synonymous with 'originality', the requirement has been treated as such by most scholars. Thus, mere alphabetical listing of elements would not constitute 'originality'. However, because most databases are now implemented as software programmes, the issue of originality operates on two levels: firstly, whether the software programme itself is an original work; secondly, whether the selection and arrangement instantiated by the software programme is original. Which level of analysis is appropriate remains an open question. If one chooses the first option, then an original software programme (in the sense that it is not a literal copy of any other programme, that instantiates an alphabetical listing, would render such a database (compilation) protectable. However, the language of Article 10 makes it clear that it is the compilation itself, rather than the methods of searching or arranging the compilation, that is protectable. Computerized methods of selection, arrangement and searching would be protected as software under TRIPS article 10(1). This would be a separate inquiry from whether, once the software has selected and arranged the contents, that compilation is itself original. The conceptual difficulty lies in how to separate the compilation from the software to manipulate, arrange and search the data.

It seems clear that the required protection for 'original databases' under the Berne Convention and the TRIPS Agreement extends only to actual originality in the structure or arrangement of the contents. Because of this, there have been increasing attempts to expand some form of intellectual property protection to unoriginal databases, in large part as an attempt to maintain existing competitive market share rather than as an incentive to create more databases. Elements of the database industry (as a subset of the software industry) have pushed for *sui generis* protection of databases that either lowers or entirely removes the originality requirement. This has led to continuing discussions at WIPO, and resulted in several studies, including studies on the 'Economic Impact of Database Protection in Developing Countries and Countries in Transition' premised on the idea that non-original databases need protection greater than that required under the Berne Convention or TRIPS.[84] The Latin American Study questioned the need for such protection and pointed out some of the dangers for developing countries.[85] The Egyptian study also comes to similar conclusions.[86]

The database industry has also pursued *sui generis* legislation at the national or regional level. An example of such regional *sui generis* protection is the European Council Directive 96/9/EC.[87] The directive provides protection for any database if it is shown that qualitatively and/or quantitatively a "substantial investment in either obtaining, verification or presentation of the contents" has been made (article 7). The directive also provides for an 'extraction right', i.e. the right to prevent "the extraction or reutilization of the whole or substantial part, evaluated quantitatively or qualitatively, of the contents of the database" (article 7). The right applies to the whole or a substantial part of a database. Protection lasts for 15 years, and that period may be renewed if there has been substantial new investment.

This directive provides a conspicuous example of the emerging rationale for protection, wherein the main goal is not to protect creativity and ingenuity and encourage dissemination of cultural goods, but rather to protect investment *per se*. It is as if a store-owner who had invested in a store that sells physical goods (such as jeans) asked for protection that would restrict anybody else from selling jeans in the same street, because they had invested so much in creating a store that sells jeans. In the same vein that the store owner has not created anything original by setting up a store that sells jeans, the seller of access to a non-original database has not created anything new deserving of copyright-like protection. What they are actually asking for is protection from legitimate competition and effective ownership over facts and data that they did not create or generate. Recent evaluations of the directive by the EU Commission have

---

[84] See Y Braunstein "Economic Impact of Database Protection for Developing Countries and Countries in Transition" WIPO Study, 7th Session of the Standing Committee on Copyright and Related Rights, SCCR/7/2, 2002 (available at http://www.wipo.int/edocs/mdocs/copyright/en/sccr_7/sccr_7_2.pdf last visited February 13, 2007)

[85] See http://www.wipo.int/edocs/mdocs/copyright/en/sccr_8/sccr_8_6.pdf

[86] See http://www.wipo.int/edocs/mdocs/copyright/en/sccr_7/sccr_7_3.pdf

[87] DIRECTIVE 96/9/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 March 1996 on the legal protection of databases (available at http://europa.eu.int/ISPO/infosoc/legreg/docs/969ec.html)

shown that the directive has not been shown to have had any impact on the growth of the European database industry, which lags behind that of the United States, despite the fact that the United States has no database protection beyond that conferred by copyright over original databases.[88] The report concludes that a *sui generis* right is not a necessary condition for a thriving database industry.[89]

IPR protection of databases, through copyright or a *sui generis* regime, can effectively become a closing off of knowledge that was in the public domain. In addition, the ability to restrict access to the database only to paying customers can damage the ability of the public to exercise the traditional exceptions to exclusive rights. However, it is this very excludability that weakens the argument for intellectual property-like protection for databases. Technology enables a reasonable amount of exclusion of most people from using the database without paying. Companies can make reasonable profits from users without needing IP rights. The only danger that companies need to be concerned with is a competitor taking and using the structure of the database, i.e. copying it as a whole, in both content and structure. However, that process is already covered under the requirement to protect original databases. If the database is not original in structure and the information contained is not protectable by copyright, what right has the database owner to expect IPR-like protection if they provide nothing new or original? In such cases, it is perfectly reasonable to expect database owners to rely on trade secrets and unfair business practice laws, just like any other business investor who takes a risk in investing in the production of goods and the delivery of services. IP is not there to protect every investor against risk, it is there to provide an incentive for the production of new goods and services that add value to society and would not otherwise have come into being without the incentive of IP protection.

Under Article 10 of the TRIPS Agreement, states must protect databases as intellectual creations through an IPR regime of their choosing. The nature and duration of such protection and the extent of exceptions to the rights will determine whether a developing country can partake of the benefits of the digital and internet revolution that databases offer.

V.2.3 Policy Considerations for Developing Countries

The recent expansion of protected subject matter provides little that would be of benefit to developing countries. Nevertheless, because of TRIPS, many developing countries now have obligations to implement copyright protection for original databases and for software. Fortunately, many options remain in terms of the manner of implementation.

It is clear that developing countries should provide, at the most, no more than a minimal copyright protection for databases. Such protection should only be extended to original structures and not to the underlying information. Braustein points out that databases are already being created in developing countries.[90] It turns out that even in developing countries, where *sui generis* database protection is largely absent, markets are small, and there is very little capital available, databases are still being developed in the absence of IP incentives. No convincing argument has yet to be made for the necessity of such protection in developing countries.

With respect to software, it is clear that developing countries should not extend patent protection to software and that whatever copyright protection they do provide should require that where the source code is the object of protection, that it is disclosed in its entirety. Such protection should not

---

[88] European Commission 'First evaluation of Directive 96/9/EC on the legal protection of databases' (DG Internal Market And Services Working Paper Brussels 12 December 2005) 5 (available at http://ec.europa.eu/internal_market/copyright/docs/databases/evaluation_report_en.pdf last visited February 13, 2007)

[89] Id. at 25.

[90] See Braunstein, Y. "Economic Impact of Database Protection for Developing Countries and Countries in Transition" WIPO Study, 7th Session of the Standing Committee on Copyright and Related Rights, SCCR/7/2, 2002, at 14. (Available at http://www.wipo.int/edocs/mdocs/copyright/en/sccr_7/sccr_7_2.pdf last visited February 13, 2007)

extend to the functional aspects of the software. In the interests of maintaining access and encouraging innovation, copyright protection for software must be subject to the full scope of exceptions for educational and personal use, especially the right to decompile the object code to make it human-readable.

V.3 Technological Restrictions on Access and Copying

The expansion of the IPR system into the new digital and internet technology has two main features to take into consideration. The first is the application of inappropriate concepts in an area which they were not designed to accommodate. The second is the creation of *sui generis* IPR regimes that accommodate the special characteristics of the new technologies (e.g. protection for unoriginal databases). This section examines a third strategy that the major content industries have used to protect proprietary material in the new digital and internet world: technological protection measures (TPMs). These tactics are essentially aimed at privatizing enforcement of copyright and placing it entirely in the hands of rights holders. While these technologies rely on copyright for their legal force, they also enable private and contractual restrictions to be placed on access in ways that leave all the discretion to the rights holder as to the scope and nature of uses they will allow, outside of the system of balances determined by copyright.[91] The following sections describe the kinds of technologies used and the legal consequences of their use. It begins with an examination of the underlying technologies, describes their uses and outlines the consequences for access to knowledge.

V.3.1 Encryption

Encryption is the process of rendering digital or (other information) unintelligible through the application of a mathematical formula. That formula or its opposite can be used to reverse the process through decryption. The easiest example of encryption is to take a sentence in English and by assigning numbers from 1 to 26 to the letters of the alphabet, replace all the letters with a number. Thus if a = 3, b = 10, c = 9, and k = 24, then the word "back" would read "103924". If one does not know what the numbers represent, the message is unintelligible and unreadable until someone with the knowledge of which number represents each letter, decrypts the message. Such encryption prevents an unauthorized or unknowledgeable person from reading the message.

Encryption can function to restrict both access and copying by rendering the material one wishes to access or copy into unintelligible noise. An example of the encryption process is the scrambled satellite signal that most satellite television distributors use to get their programmes to subscribers. Only a subscriber with the right subscriber box with the software embedded to unscramble the signal will be able to watch the programmes. Anyone else receives a jumbled mess of colour and sound if they put up a dish to receive the signal. Another example is physical products containing digital data such as digital versatile discs (DVDs) or compact music discs (CDs). The digital data is generally encrypted before being placed on the physical disc. When the product is sold, the data can be decrypted only on machines or players containing the decryption software.

All encryption is subject to the basic limitation that it can be broken by people who are sufficiently knowledgeable. In many countries, encryption is viewed as part of security and military capability,[92] and limits are placed on the export or use of encryption. Many of the levels of encryption currently in commercial use can and have been broken, and the decryption programmes have been

[91] M Radin, *Regulation by Contract, Regulation by Machine*, 160 J. INSTITUTIONAL & THEORETICAL ECON. 1, 5 (2004). (Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=534042 last visited February 13, 2007)

[92] For example, the United States regulates the export of goods and tools that use encryption through the Bureau of Industry and Security. See http://www.bis.doc.gov/Encryption/

quickly distributed through the internet. The case of DVD copy protection encryption is one example. The CSS code protecting DVDs from being copied onto computers was broken by a Norwegian student, who then distributed his DeCSS decryption code through the internet.[93]

Industry actors have the option of either engaging in a continuing arms race, which they may lose because of government restrictions on the level of encryption available to them, or they can aim to have sanctions imposed on those who circumvent encryption. The industry has chosen the latter approach, which is examined below in the section on anti-circumvention measures.

Decryption capabilities remain available only to a few technological adepts in each country. For the vast majority of users, the encryption forms an effective barrier to access and to copying. In combination with legal sanctions against breaking such encryption, these technologies present an insurmountable barrier to the majority of individuals in developing countries. Such restrictions make it difficult for users to exercise their public rights, which depend on access to the underlying information, either through library systems or publicly accessible television and radio broadcasting.

V.3.2. Encryption and Pay-to-View on the Internet

One business model that is reliant on encryption is the pay-to-view model where a broadcast or transmission can only be viewed if one has paid for access which will unscramble a signal. This can also be achieved without encryption but by restricting the ability to view by paid access to a specific location. An early example of the pay to view model by paid specific location access is the film distribution business before the advent of the video cassette recorder and its offspring.[94] Because film stock was so expensive to produce and such stock could be directly controlled by limited distribution to theatre owners, viewers could be charged on a per-view basis by drawing them to the movie theatre. The current decline in movie theatre attendance in developed countries has been attributed to the increased quality and ubiquity of legal options such as DVD players, high definition televisions, and DVD sales and rentals.[95] Viewers need no longer pay per view, now that they can own a film and watch it whenever they choose.

The pay-to-view model, also called the datacasting model, can also be similar to one based on the satellite or cable television provider business model. In the model, a periodic subscription fee is levied before a user can have access to a website or other internet site. Without a password, the site cannot be viewed, or the data stream cannot be unscrambled or read. Payment for access may be guaranteed by way of automatic, on-line debiting of a credit card account or a bank deposit account. Pay-to-view sites still have to deal with the fact that even if someone pays for access, each viewing of a website creates a transient copy of the site on the computer. In addition, the website can be downloaded as a whole, or printed out, although there are now some technologies to prevent this as well. This model is increasingly used in the journal publishing business which is switching over to digital-only subscriptions because of the reduced costs. In doing so however, they reduce the ability of users to copy and download material that they have already paid for.

Websites can use encryption to prevent access, but once access has been granted, the very technology that makes copying possible is the one required for viewing the website in the first place. Some websites and website users have attempted to protect their data by tracking unauthorised use rather

---

[93] Electronic Frontier Foundation *et al.* 'Digital Rights Management: A Failure in the Developed World, a Danger to the Developing World' Submission to the ITU-R Working Party 6M Report on Content Protection Technologies (March 2005) at 10 (Available at http://www.eff.org/IP/DRM/drm_paper.pdf (last visited February 13, 2007).

[94] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 58. (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[95] See L Holson "With Popcorn, DVD's and TiVo, Moviegoers Are Staying Home" New York Times, May 27, 2005.

than by blocking use altogether. One way is through the use of internet spyware, programmes that track the internet usage on your computer. Such programmes make it possible to detect and trace any subsequent unauthorised uses of the accessed subject matter. In addition to the privacy issues, these systems shift enforcement into the hands of copyright owners which may not necessarily be in the interests of developed countries. A spectacular example of this kind of tracking problem going wrong is the Sony BMG Corporation's attempt to secretly track the usage of music by purchasers of their CDs.[96] When played on a computer, the CD installed tracking software that also inadvertently created security flaws in other programmes, causing breaches in large private commercial networks. Sony was forced to withdraw the programme and CDs and forced to settle with customers who had sued the company for damages caused by its spyware.[97]

V.3.3 Pay-to-Download on the Internet

The pay-to-download model is meant to resemble the sale of products in the physical world and is found largely in the music industry. The initial foray of the music industry onto the internet was the subscription method, which provided limited access to their back catalogue of artists. The advent of ripping technology changed the industry's attitude to the potential of the internet when it discovered that not only were individuals making digital copies of music onto their computers, but they were also making those copies available for free on the internet.

Such free exchange took place in two primary ways. The Napster model provided a central computer server on which individuals could store information about all their music and which would provide a link to the computer on which these were stored and transfer the requested file from one computer to another. Individuals would provide access in exchange for access to other people's stored music. The KaZaA model, on the other hand allows people on the internet limited access to folders on each other's computers, where music is stored, without storing information on a central server. In addition, there are other models such as Morpheus and Grokster. These models operate in addition to the simple sharing of such digital media files by email or over commercial Local Area Networks (LANs) or Wide Area Networks (WANs) owned by businesses and used by their employees.

The music industry in the United States was able to stop the first kind of sharing by bringing copyright infringement lawsuits against Napster, which provided the central server.[98] In addition, Grokster, Morpheus and KaZaA have been held liable for their user's infringement practices by inducement of copyright or other theories of third party liability. However, such liability has been premised on concepts of indirect or vicarious responsibility that are peculiar to the United States and a few other common law systems. Such broad interpretations of what constitutes copyright infringement are not transferable to other jurisdictions and developing countries should consider the serious benefits that such programmes may present and perhaps focus on the need to ensure copyright protection against direct, large scale commercial copying.

Despite the findings of liability, the reality of programmes enabling peer to peer sharing has not been closed off. This type of sharing has proved difficult for the industry to stamp out for two reasons: the lack of alternative sources of downloadable music sources on the internet; and the fact that tracing individual unauthorised use on the internet is technologically difficult, although becoming less so.

---

[96] J DeBeer 'How Restrictive Terms and Technologies Backfired on Sony BMG Music' (2005-2006) 6 Internet and E-Commerce Law in Canada, 94.

[97] J deBeer "How Restrictive Terms and Technologies Backfired on Sony BMG" Internet & E-Commerce Law in Canada, Vol. 7, No. 1, March 2006, 2 (Available at http://ssrn.com/abstract=901305 last visited February 13, 2007)

[98] Marjorie Heins, 'The Progress of Science and Useful Arts: Why Copyright Today Threatens Intellectual Freedom', THE FREE EXPRESSION POLICY PROJECT, New York, NY 10001, 2003, at 35. (Available at http://www.fepproject.org/policyreports/WillFairUseSurvive.pdf last visited February 13, 2007)

However, the music industry was finally persuaded that the internet could become a significant revenue stream rather than simply a haven for music file-sharing. The Apple iTunes music store, which sells songs to be played on the Apple iPod player, is one example, although of limited usefulness because of its reliance on an unsustainable model tied to a specific player. It has used a form of encryption to limit the ability of users to share the music bought at the store or to play it on any other device but an Apple device. However, this model has been challenged by consumer and competition authorities in Europe.[99] Other legal services that do not have the restriction of being limited to a single player have sprung up[100], although many still attempt to restrict the number of copies that can be made and the transfer of such copies.

The pay to download model is increasingly used in the journal publishing business which is switching over to digital only subscriptions because of the reduced costs.[101] These technologies create a windfall for such companies which receive, for free from scholars, the articles that they publish and usually require that the author relinquish almost all copyright. Their contractual terms for access can, in the meantime, restrict the ability of libraries to exercise the exceptions that they had traditionally enjoyed with their print subscriptions. Thus, a library may have to pay separately for each download of a paper made through its subscription versus buying one copy and being able to make copies as required by students and professors.

Pay-to-download schemes can be extended to all valuable pieces of data on the internet. While it is possible to download entire websites or documents and files, elements of these that can be considered as severable individual products, like a piece of music, or a picture, or an article, can be made chargeable. Thus, even public domain documents placed on the web could become indefinitely enclosed. On its own, of course, nothing could stop people from breaking the password or circumventing such technological measures and gaining access to or downloading the material, whether copyrighted or not. While some believe that the future will see copyright become of far less importance as industries switch to technology-based and encryption protection, in the form of technological barriers, such barriers cannot operate effectively without a system that imposes sanctions on circumvention. The following sections describe the growth of such systems.

V.3.4 Anti-Circumvention Measures

The very existence of technological protection measures is sufficient in many cases to prevent access and use by all but the most sophisticated users. However, the global and distributed nature of the internet means that wherever such individuals bypass such restrictions they can, if they so wish, distribute the unprotected material throughout the internet, almost instantaneously. These acts of circumvention have led to a push by major copyright industries to have legal sanctions enacted against such circumventions.

Acts of Circumvention can be classed into two groups: those that circumvent access control measures; and those that circumvent copy-protection measures.

- *Circumvention of access control:* anti-circumvention laws would sanction any person who broke a code or used an unauthorized decryption to break a code or password. One option is to impose sanctions on the circumvention regardless of whether the content behind the code is copyright protected. This would base the 'right to prevent access' on the access control

[99] D Ibison, E Terazono and R Waters "Norway declares Apple's iTunes illegal" Financial Times, 24 January 2007.

[100] For a list see "Special Report: Digital Music – Where to download music legally" Guardian Unlimited (available at http://arts.guardian.co.uk/netmusic/page/0,,1127237,00.html)

[101] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 40. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

measure rather than on the nature of the content behind the access control measure. Another possibility is to impose sanctions only for circumvention of access control measures to copyrighted or protected material. While basing the protection on the nature of the material behind the barrier, such sanctions may not cover circumventing access control measures to a database of public domain knowledge. The second option may be considered friendlier to public access to public domain knowledge. A third option would add an exception to the first two, stating that circumvention of access control measures for the purpose of exercising legitimate public use rights to copyrighted material would be exempted from sanctions.

- *Circumvention of copy-protection measures:* anti-circumvention laws would impose sanctions on the circumvention of measures to prevent copying of the content. An example of this is the DVD protection that prevents copying of the DVD, unlike music CDs which can be copied. Again, these can be of two types: imposing sanctions on measures that prevent copying regardless of whether the content is itself copyright protected, or only imposing sanctions if the material behind the copy-protection is copyright protected. Again, a third option would add the exception for circumvention for legitimate public use of copyrighted material.

Anti-circumvention measures can also be targeted at the technologies that enable circumvention rather than the acts of circumvention themselves. Thus, a software programme that can be used to circumvent such restrictions would be banned. In the same way, hardware that would be used to circumvent such restrictions would also be banned.

In the United States, application of these measures has occurred under the Digital Millennium Copyright Act[102] (DMCA) which takes the approach of banning both devices and acts of circumvention (of access control mechanisms, not copy control). There is no general fair use exception but it sets up a regulatory process through the Library of Congress and Registrar of Copyrights which reviews every year the petitions of user groups that claim that their access would be restricted.[103] This approach presumes all acts of circumvention are disallowed unless the use or exception is explicitly listed through the regulatory process. There is no 'fair use' defence to litigation. For those products that have been legally accessed to begin with, Section 1201(a)(B) of the DMCA allows acts of circumvention for fair uses. However, no obligation rests to enable such fair use, and the ban on circumvention devices therefore makes it impossible to use such devices to carry out circumvention.[104] Thus the 'fair use' provision is, at best, illusory.

In the EU, TPMs and anti-Circumvention measures were addressed in the European Copyright Directive of 2001[105], which bans both acts of circumvention of copy controls and access controls purported to maintain public interest exceptions. However, because of the desire to harmonize, it ended up listing a minimalist set of exceptions and limitations rather than encompassing the entirety of practices available within the EU. In the first instance, as Dusollier points out[106], article 6(4) of the Directives relies on voluntary measures by users of TPMs to enable exceptions and limitations. This would enable such owners to limit the ways in which such rights are exercised since there is no standard for determining when such voluntary measures are inadequate.[107]

---

[102] Digital Millennium Copyright Act, Pub. L. No. 105-304, 112 Stat. 2860 (1998) (codified at 17 U.S.C. § 1201 et. seq.)
[103] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 99. (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)
[104] Id. at 97.
[105] Directive 2001/29/EC
[106] S Dusollier 'Exceptions and Technological measures in the European Copyright Directive of 2001- An Empty Promise' (2003) 34 IIC No. 1, 63
[107] Id. at 71.

However, the concept of placing the burden on the users of such TPMs to enable the use of such exceptions is a good way to begin to address the problem. The difficulty is that where an exception is defined not by the user, but by the kind of use e.g. personal copies or second-hand sales, such a system breaks down in the light of escalating transaction costs for consumers and rights-holders alike. TPM solutions that allow every consumer to make a personal copy are unlikely to satisfy rights holders, and consumers should not be limited in the full exercise of their right by the reluctance of right-holder abilities to provide for the full use of all exceptions and limitations.

In Europe, the voluntary nature of such provisions is compounded by the fact that, unlike the software and database directives, the exceptions and limitations can be interfered with by contract.[108] Thus a TPM user could demand that a consumer give up a certain scope of the exception to access the work, despite the fact that the consumer is entitled to the full scope of the exception.

V.3.5 Digital Rights Management (DRM)

DRM, while sometimes confused with the actual technology used to restrict access is rather a particular use of the technology by rights holders to 'manage' the use of the material they 'own' by establishing a contractual and other relationship between copyright-holder and user. DRM can extend to click-wrap licences, where users agree to the terms of use before gaining access to the material and, also agree that they do not own the material that they access, no matter the copyright status of the material. This is most often seen in the software industry. It can also be used to limit or expand the nature of the use past the date of the first sale of the product by obligating the user to return to the copyright holder to either maintain their access or to receive updates. Software DRM then implements and controls the execution of the contractual terms imposed by the holder.

DRM is therefore a powerful tool in the arsenal of copyright holders and enables entirely private and contractual enforcement of copyright holders' interests outside of any public interest balance. While DRM includes such contractual controls, it is powered at its core by technical controls that enforce the contractual controls. There is therefore no need to go to court to enforce contractual obligations. Software, and encryption, is used to automatically define the kinds of uses a copyright holder will allow, and to coerce users to comply. A prime example of this is the technical restriction Apple places on music bought on its iTunes music site which can only be played on Apple devices but not on other music players and can only be used on five authorized devices. The conditions of use can be changed by Apple at any point by requiring constant updates of the software. DRM can be used to require that users purchase updates if they wish to maintain use of, and access to, material that they have already purchased.

However, in order to function properly, DRM requires that certain information therefore accompany the product that allows the technology to track and 'manage' each product that is sold. This is sometimes called Rights Management Information (RMI). It essentially involves attaching a digital marker to digital or internet content that contains information about the author, publisher, date of production, or any other information identifying the copyright owner of the material, and sometimes the user. Such information would then be used to track and identify unauthorized copies, authorized and unauthorized uses and enable copyright notification. The tracking of unauthorized copies could require that users register as a purchaser of the digital or internet content so that any other copies that were unregistered could be tracked and the purchaser could be identified as the source of the unregistered copies.

Thus, where DRM is combined with TPMs, as it inevitably is, what results is a powerful means of controlling not only the initial access and use by one consumer, but all subsequent use by any other consumer with whom the first consumer engages. In this scenario a consumer is no longer a buyer, they do not get ownership of the cultural good that they buy. They only purchase a licence. Thus, every user is essentially purchasing a licence to access a product rather than owning it outright. This implicates the

[108] Id. at 72.

first-sale doctrine[109], as well as the ability to exercise a host of exceptions to copyright by virtue of removing the physical ownership of the good out of the consumer's hands.

If fully implemented without safeguards, these systems allow a person or entity to exercise total control over the cultural product, regardless of whether it is under copyright. This could lead to the privatisation of an entire world of information.[110] Where the material is copyrighted it entirely destabilizes the balance between the limited monopoly and the traditional and necessary public interest exceptions for access. Such restrictions also enable the imposition of contract terms that would require users to contract out of their public interest rights if they wish to access the information behind the TPM. As Correa notes, direct interaction with users enables rights holders to force contracts onto users that remove fair use rights.[111] Some examples of ways in which DRM and TPMs may enable limitations on access in developing countries include:

- Limitations on making information available to disabled people, such as automatic voice-readers for blind people.[112]
- Since libraries may not be able to download physical copies of the electronic material to which they have access due to licensing restrictions, they may lose access if a journal or company goes out of business.[113] In addition, licensing may limit the number of downloads a library may allow, and it may limit the ability to allow off-site access to library materials. Libraries may in fact end up with fewer rights in the digital world that they do in the physical print world.[114]
- DRM may prevent the resale or redistribution of goods. For developing country institutions reliant on donations of such goods DRM makes such donations difficult.[115] In addition, the thriving markets in second-hand goods that drive the informal economy in developing countries could dry up with severe consequences for employment and income levels.
- DRM imposes severe costs and limitations on distance education. Restrictions on the amount of copies that can be made and shared, as well as restrictions on how long a work can be kept and stored all interfere with sustainable transmission and distribution of education over television, radio or the internet. This may force institutions to repurchase materials each time they teach rather than pay a one time cost for actual ownership of the goods.[116]

DRM and TPMs do not really allow for the exercise of exceptions and limitations, since they can really only reliably apply those that can be reduced to simple yes or no questions.[117] In addition, any system would have to dynamically account for the jurisdiction in which the user is accessing the material. Given the costs of such systems, rights holders are likely to develop such flexibilities only for the major markets of Europe and the United States bypassing developing countries that do not present sufficient markets. Thus, even those countries that require better flexibilities will be bypassed and ignored and have

---

[109] That control of a good past the after sale belongs to the purchaser not the seller. It particularly limits controls on distribution.

[110] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 36. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[111] CM Correa 'Fair Use in the Digital Era' (2002) 33 IIC 570, 581

[112] Electronic Frontier Foundation *et al.* 'Digital Rights Management: A Failure in the Developed World, a Danger to the Developing World' Submission to the ITU-R Working Party 6M Report on Content Protection Technologies (March 2005), at 14. Available at http://www.eff.org/IP/DRM/drm_paper.pdf last visited February 13, 2007).

[113] Id. at 16.

[114] Id.

[115] Id.

[116] Id. at 22.

[117] Marjorie Heins, 'The Progress of Science and Useful Arts: Why Copyright Today Threatens Intellectual Freedom', THE FREE EXPRESSION POLICY PROJECT, New York, NY 10001, 2003, at 42. (Available at http://www.fepproject.org/policyreports/WillFairUseSurvive.pdf last visited February 13, 2007).

to use systems developed for United States and European sets of exceptions.

V.3.6 Policy Considerations by Developing Countries

In considering these issues, it important to view the internet as a global phenomenon. Access limitations applied in developed countries reduce the available information on the global internet and therefore reduce access for individuals in developing countries. Developing countries have a vested interest in how these issues play out in developed countries and international fora. They cannot simply apply national law in this arena and feel safe that they have assured access for their populations. Only strong international rules can ensure a healthy public domain of material for developing countries to access.

Developing countries that have not signed up to the obligation to ensure protection for technological protection measures and implementing anti-circumvention measures should refrain from doing so. In addition, they should refuse to include such obligations in any new treaties on digital and internet content as inappropriate for development and access.

For those countries that have committed to such obligations, an initial framework for developing countries should, at a minimum, ensure that the burden is placed on owners and those who apply TPMs to enable access for the full exercise of limitations and exceptions. The protection should only be for copy control and not for access controls. In addition, any such protection should be limited only to acts of circumvention of TPMs that protect copyrighted material. Such protection should not ban devices which may be used for circumvention, as many of them have significant uses that are legal. Finally, the WIPO Copyright and the WIPO Performances and Phonogram Treaties only require adequate and effective protection, meaning that states are free to determine the level and nature of such protection.

Developing countries will have to regulate the production and distribution of digital and internet content that enter their domain of sovereignty. The technical issues present severe problems on their own, without the additional burden of having to legislate in this area prematurely and with little flexibility. It is in the area of international rule making that the future of digital and internet content may be determined before developing countries even have a chance to consider the subject matter for their own populations. If developing countries are to set their own agenda for digital and internet content, they will have to direct the international discussion in ways that serve their needs.

V.4 Expanding the Global IP Governance of Digital and Internet Content

The international governance of IPRs has always managed to adjust in order to deal with new subject matter, but it has struggled with how to properly include digital and internet content. This has been compounded by the speed with which rights holders have pushed for international rules on digital and internet content.

With the advent of digitization and the internet, a global, instantaneous market for the goods produced by world content industries emerged. They no longer had effective control over the segmentation of their international markets or their distribution timetables. National legislation alone could not ensure effective control under these new market conditions. The industries responded by lobbying for more international protection resulting in agreements such as TRIPS and the World Intellectual Property Organization's (WIPO) Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT).

The WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaties (WPPT) are referred to as the 'Internet treaties'. The treaties are the first serious multilateral attempt to deal explicitly with the issue of digital and internet content. They have not been widely signed or ratified, but increasing pressure in the form of bilateral agreements is being brought to bear on

developing countries to ratify them without fully assessing how they will affect their participation in the digital and internet revolution. The majority of signers who have enabled them to come into force have been developing countries[118] while most other developed and middle-income countries have refrained from entering into such commitments.

This section will discuss some of the new elements of the WCT and the WPPT, the so-called WIPO Internet Treaties, focusing on the intellectual property rights they require contracting parties to grant with respect to digital and internet content, and the limitations exceptions that they provide for public use. In particular, this section will analyze new subject matter, new rights granted, and especially whether traditional limitations and exceptions are diminished or reduced. This section presumes a basic familiarity with both the Berne Convention and the TRIPS Agreement as the underlying agreements on copyright and does not go into an explanation of those agreements.[119]

V.4.1 The WIPO Copyright Treaty (WCT)

The WIPO Copyright Treaty[120] was adopted in Geneva in December 1996 and had 62 contracting parties as of February 2006. It came into force in March 2002.

a. Subject Matter

The treaty extends copyright protection to computer software as literary works under the Berne Convention (Article 4) and also extends protection to compilations of data (databases) as intellectual creations (Article 5), replicating the language of the TRIPS Agreement.

Article 1(4) at first glance seems quite innocuous stating that "Contracting Parties shall comply with Articles 1 to 21 and the Appendix of the Berne Convention." However, the agreed statement interpreting article 1(4), which extends the reproduction right into the digital environment, noting that the rights and exceptions are fully applicable, presents a major change to the agreement. Taken literally, any form of storage in a digital medium is considered a reproduction.[121] By accepting this formulation, a country agrees to treat ***all*** digital activity using digital and internet content as a copy. Thus, digitization, running programmes that manipulate digital and internet content, transmitting the content over the internet and downloading the content would all be considered acts of reproduction. This unprecedented expansion of the reproduction right essentially applies to all digital and internet activity. Since exceptions to the reproduction right are also the most restrictive, this encloses a larger portion of knowledge and severely restricts the exercise of public access and compulsory licensing exceptions over digital and internet content. However, the failure to achieve consensus on the agreed statement leaves open the interpretation of whether the reproduction right actually extends to digital content for all signatories and members of the Berne Convention.[122] As Ricketson points out, the lack of consensus means that the statement cannot be treated as part of the treaty, and must therefore be

---

[118] R Okediji, Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce (ICTSD Geneva 2005) at 24 (Available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf last visited February 13, 2007)

[119] A useful source for examining these agreements is R Okediji "The International Copyright System: Limitations, Exceptions and Public Interest Considerations for Developing Countries" (ICTSD Geneva 2005). (Available at http://www.iprsonline.org/unctadictsd/docs/Okediji_Copyright_2005.pdf last visited February 13, 2007)

[120] http://www.wipo.int/treaties/en/ip/wct/

[121] *For an interpretation of the early EU proposals that embodied this language, see* C Correa "Implications of Intellectual Property Rights for the Access to and Use of Information Technologies in Developing Countries" Discussion Paper 2000/2 UNU-INTECH, International Workshop on the Information Revolution and Economic and Social Exclusion in Developing Countries, Maastricht, 23-25 October 1996, at 36.

[122] S Ricketson "WIPO Study on Limitations and Exceptions Copyright and Related Rights in the Digital Environment" WIPO SCCR/9/7 2003, at 60. (Available at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=16805 last visited February 13, 2007)

viewed as a supplementary means of interpretation. Effectively, developing countries are free to determine the extent to which they will treat digital content as subject to the reproduction right under the Berne Convention. However, it is also important to note that subsequent state practice is also important in determining the meaning of 'ambiguous' provisions.[123] Thus developing countries should ensure that they reiterate in international fora and in any domestic law, the view that Article 1(4) does not require them to fully apply the reproduction right to digital and internet content.

b. Rights granted

The WCT grants a new distribution right (Article 6) to authors of literary and artistic works subject to national rules of exhaustion. Neither the Berne Convention nor TRIPS requires that a state grant a right of distribution. The agreed statement on Articles 6 and 7 limits the right of distribution only to fixed, tangible objects, thus exempting digitization and internet transmission. Exclusive rights of rental for computer programmes, cinematographic works, and works embodied in phonograms are provided for (Article 7), as well as a right of communication to the public (Article 8) by "wire or wireless means, including the making available to the public of their works in such a way that members of the public may access these works from a place and at a time individually chosen by them." This provision is explicitly aimed at web browsing and internet transmission. Signing on to such a right would reduce public access to material on the internet, by ensuring that search engines would have to pay a licence for copying and storing pages and allowing people to search and view them. The article does maintain the compulsory licensing provision under Berne 11bis(2) and the agreed statement makes it clear that hosting a website would not be a communication under the WCT, thus exempting Internet Service Providers (ISP) from any liability.

States are required to provide protection against circumvention of technological measures (Article 11), although the particular implementation is left to national law. The creation of these new rights is again a major alteration of the copyright landscape, which developing countries need to approach with caution. The WCT also requires protection against tampering with rights management information (RMI) used to exercise rights under both the Berne Convention and the WCT (Article 12).

c. Exceptions

Article 10 provides the general exception, replicating the three-step test articulated in the Berne Convention and in TRIPS. However, unlike the Berne Convention, this applies to all exceptions not just to exceptions under the reproduction right. In the WCT, the three-step test is enunciated in Article 10(2). Accordingly, Contracting Parties shall, when applying the Berne Convention, confine any limitations of or exceptions to rights provided for therein:

Step 1: to certain special cases;

Step 2: that do not conflict with a normal exploitation of the work and,

Step 3: do not unreasonably prejudice the legitimate interests of the author.

This statement is derived from the TRIPS formulation found in article 13. Article 13 of TRIPS, unlike the WCT formulation, does not mention the Berne Convention, although the convention is incorporated by Article 9. This has left some confusion regarding whether Article 13 fully applies to the exercise of the Berne Convention exceptions, since the Berne Convention has its own conditions for the exercise of exceptions and limitations to rights. The inclusion of the Berne Convention language in the WCT was an attempt to make it clear that the three-step test does apply to the exercise of Berne Convention exceptions, including the compulsory licensing in the Appendix. Cognizant of this, states added an agreed statement on article 10, which noted that "It is understood that the provisions of Article 10 permit Contracting Parties to carry forward and appropriately extend into the

[123] Article 31(3)(b) of the Vienna Convention on the Law of Treaties (1969)

digital environment limitations and exceptions in their national laws which have been considered acceptable under the Berne Convention. Similarly, these provisions should be understood to permit Contracting Parties to devise new exceptions and limitations that are appropriate in the digital network environment."

The language of the agreed statement still leaves major changes in place. The three-step test, if adopted verbatim in national legislation shifts the burden of proof of compliance with the test to the user rather than the rights holder. Developing countries should avoid implementing any language in their legislation that places the burden of proof on the state or private actors exercising traditional public fair use and access rights.

In an agreed statement, the contracting parties agreed that this article permits "Contracting Parties to carry forward and appropriately extend into the digital environment limitations and exceptions in their national laws which have been considered acceptable under the Berne Convention. Similarly, these provisions should be understood to permit Contracting Parties to devise new exceptions and limitations that are appropriate in the digital network environment". Developing countries should treat this statement as part and parcel of the agreement and take every opportunity to reiterate it at every level and negotiating forum.

V.4.2 The WIPO Performances and Phonograms Treaty

The WPPT was adopted in Geneva in December 1996 and had 60 contracting parties as of February 2007. It entered into force in May 2002. It attempts to adapt some of the concepts established in the Rome[124] and Geneva[125] Conventions (on phonograms and the rights of performers) to digital and internet content. It also includes some elements of broadcasting.

a. Subject Matter

Article 2 expands the definition of fixation to include any embodiment or representation of a sound, thus including digitization of sound recordings, communicated or received through any device. Broadcasting is still defined as transmission by wireless means, while "communication to the public" includes transmission to the public by any medium, including making them audible to the public.

b. Rights Granted

The WPPT grants moral rights to performers for their performances, provides performers with the right to authorise fixation of performances and the broadcast or communication to the public of the fixed performances. Article 10 provides a right of making available to the public, which covers the making available of the material on a website or hosting the material on a website or server. Thus, no one may make such material available to anyone else, either on their own computer or their website if it is accessible to the public. This is particularly targeted at file sharing sites, although there remains a question of the distinction between direct and indirect liability. Rights holders are also provided a right of reproduction, which has the same effect as the WCT of defining every act of web viewing or running and manipulating programmes on sound recordings as reproduction.

The WPPT also imposes the same WCT obligations on anti-circumvention measures and digital rights management information. Article 6 provides performers the right to authorise the fixation of

[124] International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (signed in Rome, on 26 October 1961). (Available at http://www.wipo.int/treaties/en/ip/rome/index.html last visited February 13, 2007)

[125] Geneva Convention for the Protection of Producers of Phonograms against Unauthorized Duplication of their Phonograms (signed in Geneva, 1971). (Available at http://www.wipo.int/treaties/en/ip/phonograms/index.html last visited February 13, 2007)

performances and the broadcast or communication to the public of the fixed performances. Thus, performers have the right to restrict internet transmission of their performances. However, that right is essentially superseded by Article 7.

Article 7 provides a right of reproduction which, according to the agreed statement concerning Articles 7, 11 and 16, fully applies in the digital environment. The storage of a protected performance or phonogram in digital form in an electronic medium constitutes a reproduction within the meaning of Articles 7, 11 and 16. This defines every act of web viewing or of running and manipulating programmes containing performances as reproduction. However, this agreement was adopted by consensus and thus states may be obliged to act to recognize any digital manipulation of digital phonograms and performances as reproduction.

Article 8 provides a right of distribution, and Article 9 a rental right for performers. However, the distribution and rental rights are limited to tangible copies, not digital copies or transmission. Article 10 provides a right of making available to the public, which covers the making available of the material on a website or hosting the material on a website or server. Thus, no one may make such material available to anyone else, either on their own computer or their websites, if it is accessible to the public.

Article 11 provides a reproduction right for producers of phonograms, of the same standard as that for performers, with much the same consequences. Article 12 provides a distribution right to producers. Article 13 confers a rental right and Article 14 a right of making available to the public. Article 15 which provides a right to producers of phonograms to remuneration for broadcasting or communication to the public, is one of the few that a state may notify that it will refuse to apply or apply in a restricted manner.

Article 18 imposes the same WCT obligation on anti-circumvention measures and Article 19 imposes the same measure on digital rights management information.

c. Exceptions

The general exception is contained in Article 16 (1) where “Contracting Parties may, in their national legislation, provide for the same kinds of limitations or exceptions with regard to the protection of performers and producers of phonograms as they provide for, in their national legislation, in connection with the protection of copyright in literary and artistic works.” There is a suggestion that this time be limited and where changes are made to expand limitations and exceptions for literary and artistic works these would apply equally to material protected under the WPPT. Article 16(2) reiterates the three-step test with the added limitation that, unlike the WCT, it does not incorporate the Berne Convention exceptions. However, the agreed statement aims to ensure that this neither reduces nor extends the scope of the exceptions provided for under the Berne Convention.

V.4.3 Policy Considerations by Developing Countries

The treaty systems provide minimum standards and do not prevent states from providing greater protection. Increasing bilateral pressure to join the WIPO Internet Treaties may be rushing developing countries into untenable situations. Developing countries have been the significant portion of signatories despite the fact that they, for the most part, have little or no access to ICTs or digital and internet content.[126] By joining digital and internet content treaties too precipitously, they essentially become subsidisers of the system since they are providing protection for goods to which they have little or no access in the short term, and they are limiting whatever access they may be able to achieve

[126] R Okediji, Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce (ICTSD Geneva 2005) at 24 (Available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf last visited February 13, 2007)

in the long term. In addition, for those countries that do have some access, the short term costs of access to information will increase substantially.

The combination of the Berne Convention, TRIPS and the WCT and WPPT with their agreed statements presents a complicated thicket, which makes it difficult for developing countries to determine the exact extent to which traditional exceptions apply in the digital and internet arena, and the extent to which they are able to fashion appropriate remedies to maintain public access and use rights. An understanding of the internet as a datacasting tool that breaks down differences between different kinds of content and transmits it through wire and wireless means may enable the creation of appropriate IPR policy for digital and internet content. Any moves to incorporate the norms of the WCT and WPPT into TRIPS should be resisted. States that have not signed up to the WCT and WPPT should refrain from doing so and those that have, should consider withdrawal. However, a significant minority have joined these agreements as part of their bilateral trade obligations, such as in free trade agreements with the United States. In such cases, states should consider carefully the crafting of appropriate exceptions and limitations as well as the maintenance of access friendly interpretive norms for the agreed statements of the WCT and WPPT.

In the context of the proposed WIPO Broadcasting Treaty, developing countries should also take note of new developments in WIPO[127], which may limit the flexibilities available from treating internet transmission as a form of broadcasting or datacasting. The South Centre research paper "A Development Analysis of the Proposed WIPO Treaty on the Protection of Broadcasting and Cablecasting Organizations"[128] provides a thorough evaluation of the proposed treaty and the dangers it presents. For the purposes of this paper, it suffices to note the following: the major content industries are still seeking to expand the definition of broadcasting to cable and wireless means as well as transmission over wires, all of which implicate internet transmission. While it has been agreed that much of the language referring to internet transmission will be removed from future texts, developing countries will still have to grapple with attempts to reintroduce such issues in the run up to the planned diplomatic conference in late 2007.

Developing countries should also be aware that the danger of international rule making also lies in the manner in which such treaties are implemented in developed countries. If developed countries enact severe and restrictive legislation such as the DMCA in the United States that governs the use of digital and internet content in their countries and the manner in which it can be accessed, this limits the availability of such information on the internet for developing countries. In effect, the legislative battles that are ongoing in developed countries such as the United States and the EU have a direct bearing on developing country access to digital and internet content. Along the same lines, the inclusion of DMCA-like standards in the bilateral free trade agreements being pursued by the United States also pose the danger of restricting the total information available on the internet. This is particularly true where the United States has targeted growing countries such as Malaysia, Thailand, Chile and Peru that could have provided a strong and healthy basis for developing country information sharing and knowledge by virtue of their technological head start.

The European Union's pursuit of bilateral agreements should also be approached with caution, especially in its negotiations for European Partnership Agreements with the 76 member African, Caribbean and Pacific group of countries. There are indications that the EU will be seeking to have the entire group accede to the WIPO Internet Treaties which would change overnight the balance of countries attempting to apply development appropriate copyright policies, both domestically and in international fora.

---

[127] See Draft Basic Proposal for the WIPO Treaty on the Protection of Broadcasting Organizations Including Non-Mandatory Appendix on the Protection in Relation to Webcasting (SCCR14/2) available at http://www.wipo.int/edocs/mdocs/sccr/en/sccr_14/sccr_14_2.pdf

[128] V Munoz & C Waitara, "A Development Analysis of the Proposed WIPO Treaty on the Protection of Broadcasting and Cablecasting Organizations" (South Centre Geneva 2007) (available at http://www.southcentre.org/publications/researchpapers/ResearchPapers9.pdf)

VI. TOWARDS A DIGITAL AGENDA FOR DEVELOPING COUNTRIES

Copyright is, above all, a statement about the value that a nation places on its cultural creativity and patrimony. Copyright reflects what a country values the most about its own culture and how that culture and knowledge should be created, shared and disseminated.[129] By and large, developing countries have been forced to accept a copyright policy model based on the values and cultures of commercial actors in developed countries who do not necessarily share the values and cultures of individuals and communities in developing countries. This extends from requirements to pass particular kinds of laws[130], to establishing new institutions and governmental structures, to adopting foreign jurisprudence and finally, to implementing and submitting to foreign judgments.[131] Even where choice could have been exercised in the post-colonial phase of development, most developing country copyright legislation has mirrored that of the former colonial power.[132] This has ensured that developing countries remain on the periphery of global knowledge production and distribution systems in fields such as print publishing, music performance and recording, film and television, and other major cultural industries.

The advent of digital and internet technologies may, however, present an opportunity for developing countries to design for themselves more appropriate and culturally relevant systems for encouraging the production, and ensuring access to, and dissemination of, cultural products. In developing copyright policies for digital and internet content and technology, developing countries now need to go beyond the rhetoric of "stronger, faster, more" intellectual property that predominates in discussions about the creation and dissemination of culture. They are now presented with the opportunity to clearly determine in what way their development interests would be served by particular forms of copyright regimes and they can choose to act accordingly, rather than satisfying the needs of developed country content industries or small domestic interest groups.

Such an approach is even more necessary considering that the causal link between expanded copyright protection (thus limiting access both for consumption and for the raw materials for further creativity) and economic development remains tenuous at best for developed countries, let alone for developing countries. A lesson should be learned from what developed countries did when they were still developing economies: they emphasized greater access for their own nationals rather than greater protection, until they became primary producers and distributors of cultural goods themselves.[133] Even in the 20th century, it has been convincingly argued that copyright protection played a largely passive role in the development of cultural industries such as the television and film industries.[134] This only serves to outline the primary truism of the new digital age: that increased copyright protection for digital and internet content serves largely to protect the market position of already established

---

[129] For a strong statement of the values behind the concept of intellectual property see RL Gana, 'Has Creativity Died in the Third World, Implications of the Internationalization of Intellectual Property' (1995) 24 DENV. J. INT'L & POL'Y 109.

[130] e.g. The Agreement on Trade-Related Aspects of Intellectual Property

[131] RL Gana 'Has Creativity Died in the Third World, Implications of the Internationalization of Intellectual Property' (1995) 24 DENV. J. INT'L & POL'Y 109, 120.

[132] RL Gana 'The Myth of Development, the Progress of Rights: Human Rights to Intellectual Property and Development' (1996) 18 Law & Policy No. 3 & 4, 331

[133] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 12. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[134] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 59 (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

industries rather than as a necessity for increased creativity, production and dissemination of cultural goods.

The opportunity presented by digital and internet technology converges with a moment in international policy-making that presents real scope for developing countries to implement development-appropriate copyright regimes. However, the previous sections have outlined some of the limitations. The next section outlines one further consideration.

VI.1 The Reality of Access to Digital and Internet Technology in Developing Countries

In looking at the opportunity presented by digital and internet content we should not lose sight of the existing difficulties of access to ICTs in developing countries. Developing countries still lag significantly behind developed countries and that gap, depending on the measure, may be growing.[135] Nevertheless, some developing countries show significant growth in ICT access, although much of that growth is attributable to Brazil, China and India.[136] Concerted public investment in ICT infrastructure is a necessary precondition for developing countries to take advantage of digital and internet content.[137] There is a strong urban rural divide in most developing countries that leaves the majority of people without access to phone lines, satellite or mobile telephones. This is even more extreme in cases of computers, photocopiers and printing presses.

However, the so-called Digital Divide has two components that should not be conflated: access to systems and access to content. This paper focuses on access to content and is meant to be viewed in conjunction with plans and policies on increasing access to ICTs. Nevertheless, while it is true that hardware and internet access is very limited in developing countries, there already exist several mechanisms through which individuals and communities in developing countries would be able to take advantage of these opportunities immediately. In this, one has to disagree with those who argue that loosening copyright restrictions in the near term will not significantly increase access.[138]

Where exceptions or access are made available, there is a potential for explosive distribution, especially in tertiary institutions and libraries in developing countries. The first thing to realize is that such access techniques are hybrids of digital and analog technologies, therefore requiring that only one person in a sharing community have a computer and access to the internet. Coupled with analog copying and reprographic technologies such as photocopiers, as well as public communication devices such as radio, televisions and mobile phones, this makes information potentially widely accessible and easily distributable.[139]

For example, where individuals have computers but few can access the internet, one person or institution with a CD-burner can distribute many copies of the same document by burning a CD and

---

[135] UNCTAD "Development and Globalization: Facts and Figures" UNCTAD 2004, at 96. (Available at http://www.unctad.org/templates/webflyer.asp?docid=4848&intItemID=2364&lang=1 last visited February 13, 2007)

[136] UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 2. Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)

[137] See the example of South Africa in D Cogburn & C Adeya "Prospects for the Digital Economy in South Africa: Technology, People, Policy and Strategies" UNU/INTECH Discussion Paper 2002, at 22. (Available at http://ideas.repec.org/p/dgr/unuint/200202.html)

[138] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 34. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

[139] One area that presents an important opportunity is the use of radio, both internet and regular to transmit books and materials through, books on tape or books on CD.

mailing or sending copies to others. Paper copies can be made where an individual or institution has access to a photocopier.[140]

The content element of the digital divide is also crucial. There is a serious shortage of culturally relevant and appropriate material for developing country individuals on the internet. Digital and Internet Content is primarily biased to the major generators and users who are located in developed countries. This is not to say that creative content does not exist in developing countries: it may in fact be a major comparative advantage. However, the lack of digitization capacity may limit content even for those countries that provide extensive access to the internet.

These activities suggest that copyright exceptions and limitations and access rules for developing countries must take into account not just distribution and copying rules over the internet, but also analog copying and distribution if cultural goods are to contribute to real growth in developing countries. The entire distribution chain must be taken into account.[141] Story points out that what is crucial in a digital and internet world is the material that is easily and freely accessible on the internet. [142] Where the global public domain that is the internet is shrunk by practices and rule-making in developed countries, developing countries suffer accordingly. What is an annoyance to developed country users becomes a much more serious matter for individuals in developing countries, especially those with limited internet access. When the entire distribution chain of digital and internet content is taken into account it is clear that increased restrictions on access to digital and internet content in developed countries narrow the possibilities for access in developing countries.

VI.2 The Conditions, Freedoms and Rights necessary for Developing Countries to take Advantage of Digital and Internet Content

Whatever policy changes developing countries make, their impact will be felt very strongly in two areas: educational access and the development of indigenous content industries. How might digital and internet content affect these particular areas and what does this suggest about the rights and freedoms necessary to ensure that access and development are best served?

VI.2.1 Educational Access

The opportunities for developing countries are significant in the education sector (at all levels), literacy and library sectors, but especially for the tertiary educational sector (universities, technical colleges, professional training colleges) as a driver of access and distribution of digital and internet content.[143] Section III.2 outlined some of the digital and internet tools and content that may contribute to educational access to education materials. In developing countries one of the most significant drivers of better educational outcomes is access to textbooks and other instructional materials.[144]

In developing countries tertiary institutions can play a special role in enabling wider access to digital and internet content. It is at the tertiary level that educational institutions are most likely to have

---

[140] For an example of this process in action see the example of Uganda in A Rens, A Prabhala, D Kawooya 'Intellectual Property, Education, and Access to Knowledge in Southern Africa' (2006) ICTSD Regional Research Paper Southern and Eastern Africa, at 30. (available at http://www.iprsonline.org/unctadictsd/docs/06%2005%2031%20tralac%20amended-pdf.pdf last visited February 13, 2007)

[141] *See* Story at 47, while he focuses on the primacy of printed materials, I suggest that what matters is the nexus between digital and printed materials.

[142] Id. at 35.

[143] UNCTAD "E-Commerce and Development Report" UNCTAD 2004, 95.

[144] P Askerud "The Distribution of Educational Materials: Problems and Issues" UNESCO 1997, at 3. (Available at http://unesdoc.unesco.org/images/0010/001090/109092E.pdf last visited February 13, 2007)

access to computers, as well as access to the internet.[145] The tertiary sector, especially national universities, is also the area that tends to have the greatest interface with the publishing industries that disseminate educational materials such as books and journals.[146] They are also core centres for the production of research and educational materials for their country or region.[147] Tertiary institutions may also form the core of mass education and literacy systems, both as production centres and as distribution centres. Askerud points to several problems with access to textbooks and educational materials identifying distribution as the primary bottleneck.[148] While not a panacea, the use of digital and internet content and ICTs may help to reduce some of the problems that Askerud identifies such as: insufficient storage and transport facilities; lack of private funds to purchase books; absence of publishing enterprises in areas with widespread illiteracy; and the absence of conservation practices for books.[149] Distribution is a significant element of textbook cost and the easier and less difficult distribution is, the cheaper the cost of educational materials. For example, the distribution of digital books does not suffer from loss or damage issues, delivery of replacements is instantaneous, and warehousing is unnecessary. Instead of having distribution as a recurring cost, it can essentially be a one-time cost. Of course at present, distribution costs are largely due to failure of infrastructure, but in the context of a larger ICT and hardware policy, it suggests that delivery of material through digital and internet means should be a priority policy area.

The limitations of copyright especially for hardcopy materials have been especially onerous for the tertiary sectors, in which institutions have had to pay exorbitant fees for such things as photocopying of articles from journals in the library (even those written by faculty at the same institution).[150] Students have to pay for texts whose cost may amount to a significant portion of the annual earnings of an average family[151], thus ensuring that tertiary education remains the province of the wealthy elites.

Distance learning is also an area where the benefits of internet and digital content are unmistakeable. However, even distance learning courses have encountered problems of accessing educational materials. Copy/South points out the failures of some courses that required students to buy almost US $800 in textbooks.[152] The lack of access in public libraries is also a problem due to the cost of books. Where electronic access is the primary means of accessing texts, the digitization of materials is a significant hurdle for institutions which have to pay for permission to do so.[153] Examples of such programmes at the tertiary level in developing countries are:

- Virtual University of Pakistan
- Indira Ghandi Open University (India)
- Monterrey Virtual University (Latin America and Caribbean).

---

[145] B Oyelaran-Oyeyinka and C Adeya "Internet Access in Africa: An Empirical Exploration" UNU/INTECH Discussion Paper 2002-5, at 31 (Available at http://www.intech.unu.edu/publications/discussion-papers/2002-5.pdf last visited February 13, 2007) and UNCTAD "E-Commerce and Development Report" UNCTAD 2004, 103.

[146] Askerud notes that the publishing industry in developing countries depends on the educational sector for up to 95% of its income. Askerud at 3.

[147] UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 99. (Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)

[148] Askerud at 4.

[149] P Askerud "The Distribution of Educational Materials: Problems and Issues" UNESCO 1997, at 4. (Available at http://unesdoc.unesco.org/images/0010/001090/109092E.pdf last visited February 13, 2007)

[150] Discussion with Prof. Julien Hoffman, University of Cape Town, discussing the role of collection agencies in the tertiary education sector in South Africa.

[151] A Story et al (eds.) "The Copy/South Dossier: Issues in the economics, politics and ideology of copyright in the global South" Copy/South Research Group May 2006, at 96. (Available at www.copysouth.org).

[152] Story, A., et al (eds.) at 96.

[153] Id.

However, cost per student remains a significant barrier to expanding access through such programmes.[154] In addition, analog formats will remain a crucial element of the content distribution chain. The use of videocassettes, tapes and radio still form an important part of the delivery of content in distance education programmes in developing countries.[155] Nevertheless the potential for digital and internet content delivery is undeniable and has been supported by international organizations such as UNESCO.[156]

The library sector, especially as a crucial element of national education strategies, is also poised to benefit from digital and internet content, but only if the right policies are in place. At the moment, the failure to properly apply library exceptions means that libraries cannot digitize and share digital copies of their works with other libraries or with users without paying exorbitant fees. While we should not presume that all education sectors in developing countries should source all their material from the developed world, neither should developing countries be forced to re-invent the wheel. One of the earliest areas of action and, the one most likely to have the largest impact, is enabling access from developing countries to the existing electronic resources, repositories and libraries of developed country institutions. Simple email connectivity combined with an ability to search for these resources can sometimes be enough. For example, in 1991 the University of Zambia medical library established a relationship with the University of Florida medical library, which would email requested texts and information resources on request. The impact on the quality of research and work at the University of Zambia was immediate.[157]

Education has traditionally been an arena where it has been agreed that copyright holders in general, should have no right to expect significant profits. The education exception enshrined in the Berne Convention and in almost all national laws is evidence of this. This principle should be maintained and extended to digital and internet content ensuring that it is possible to take advantage of the opportunity presented.

VI.2.2 Development of Indigenous Content Industries

One of the major limits for the expansion of developing country cultural industries has been a bottleneck in distribution and marketing especially with respect to international markets. The other has been little or no purchasing power in the domestic market. With access to digitization and internet technologies, developing country entrepreneurs can now place their cultural goods in the global market more easily. With respect to the domestic market, lowered production costs may serve to decrease the barriers to entry for many producers and artists, although within the limits of access to hardware and software. Such opportunities are tempered by several issues of relevance to developing country economies:

- unpredictable economic cycles for content industries in developing countries;
- lack of enforcement of artists' rights against producers and publishers (a good example is the music industry in large parts of Africa);
- non-existent or non-operating reimbursement systems for indigenous artists;
- poor access to finance and the high cost of raw materials and equipment.

---

[154] UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 112. (Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)
[155] Id. at 113.
[156] UNESCO "Open and Distance Learning: Trends, Policy and Strategy Considerations." UNESCO 2002 (available at http://unesdoc.unesco.org/images/0012/001284/128463e.pdf last visited February 13, 2007)
[157] TW Oshikoya,. & MN Hussein "Information Technology and the Challenge of Economic Development in Africa" African Development Bank Economic Research Paper No. 36, 2004, at 8 (available at http://www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DOCUMENTS/ECONOMICSANDRESEARCH/ERP-36.PDF last visited February 13, 2007)

These are structural problems to which digital and internet technology does not necessarily provide all the answers. However, it is clear that increased copyright protection does not present a solution either, and may in fact worsen it by entrenching existing inequalities between creators and producer/distributors. The problem of copyright for creators in developing countries is one of enforcement of the very simple and basic rules against massive direct commercial copying. In this regard, the lack of collecting societies in developing countries has been pointed to as a serious gap in the copyright system.[158] Better protection of artists against commercial actors is important, but recent developments in the expansion of collecting societies suggest that these are not a panacea and that they can behave in ways that restrict access. For example, some commentators have found that because they are easy targets, educational institutions are the first targets of collecting societies rather than commercial actors who may be better able to defend themselves or are more difficult to find.[159] Developing country artists may be better protected by the enforcement of existing prohibitions against literal commercial copying, rather than taking on further enforcement and protection obligations. In addition, where artists are concerned, it is important to keep in mind that royalties form a small part of an artist's income, even in the major developed country markets.[160] This suggests that the focus of efforts in increasing artists' incomes should not be the collecting societies or the copyright system, but the inequality of negotiating power between artists and producers/publishers.[161]

The benefits to developing countries of the enforcement rather than the expanded protection approach are more evident when one takes into account the fact that from a global perspective, the direct rewards from increased copyright protection are largely directed to the publishing, entertainment and software industries in Europe and North America.[162] Firstly, this is because the subject matter of new rights, such as software, databases, broadcasts, webcasts, large commercial brands, technological protection measures, are all in fields dominated by developed country commercial interests. Thus, for each monetary unit spent by a developing country on enforcement of such subject matter, a larger proportion of the return on investment goes to rights-holders in developed countries. By focusing on direct and literal commercial infringement of basic copyright, developing countries may better serve their domestic artists and industries. Due regard should, however, be given to ensuring that such enforcement takes into account employment effects. As Rens, Prabhala and Kawooya have argued[163], the informal economy forms a crucial part of both authorized and unauthorized distribution systems and enforcement should not destroy viable and necessary distribution networks that may address largely under-served markets.

The indigenous industries most directly affected by digital and internet content are the publishing and music industries. It is important to outline the role that digital and internet content may play in these if the basic outline of rights and freedoms necessary to ensure access and development is to be complete.

---

[158] B Andersen et al "Copyrights, Competition and Development: The Case of the Music Industry" Discussion Paper No. 145 January 2000 UNCTAD, at 23. (Available at http://www.unctad.org/en/docs/dp_145.en.pdf last visited February 13, 2007)

[159] A Story et al (eds.) "The Copy/South Dossier: Issues in the economics, politics and ideology of copyright in the global South" Copy/South Research Group May 2006, at 33. (Available at www.copysouth.org).

[160] Id. at 24.

[161] See UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 86. (Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)

[162] A Story 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights *Final Report of the UK Commission on Intellectual Property Rights* (2002) at 11 (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007) citing IMF statistics.

[163] A Rens, A Prabhala, D Kawooya 'Intellectual Property, Education, and Access to Knowledge in Southern Africa' (2006) ICTSD Regional Research Paper Southern and Eastern Africa (available at http://www.iprsonline.org/unctadictsd/docs/06%2005%2031%20tralac%20amended-pdf.pdf)

a. The Publishing Industry

With respect to access issues, especially education access, in developing countries, the industry of major concern is the publishing industry, which has been a vocal opponent of increased exceptions and limitations and has generally operated with low profit margins. It has depended on the educational market, which can make up to 90% of the publishing market,[164] for most of its sales and profit growth.

While encouraging local publishing industries should be an important concern, the furthering of education and literacy may do more to encourage private consumption of the cultural goods produced by such publishers by increasing the size of the market available. The argument that strong copyright is necessary to protect local publishing industries and cultural producers must be considered in the context of actually increasing markets for such publishers, rather than strangling attempts to increase educational, library and literacy access.

Access to text repositories and to free e-Books and texts online may prove a boon for developing country publishers of educational texts, enabling new collections of materials to be published and by ensuring that even the smallest publisher can access a fully scanned and digitized text from which to make reprographic texts. The costs of accessing galleys or of typing up or scanning a text themselves are significantly reduced. For example, the entire works of Shakespeare (some of which are required texts in Anglophone developing country education systems) are available on the website of Project Gutenberg. Developing country industries can compete and produce cheap, versions of these texts which they may be able to sell at a cost significantly lower than that offered by importers. This may introduce long-overdue competition into such industries in developing countries, where usually the market has been captured by two or three publishers who are subsidiaries of developed country publishers.[165] Access to digital and internet content can only serve to free domestic publishers from dependence on developed country publishers for their source material and allow them to both publish material produced indigenously and material produced in other countries.

b. The Music Industry

While digital and internet technologies pose a challenge to the major record labels and producers, there is an equivalent opportunity for artists to regain control of their materials and to have access to global markets and distribution channels.[166] The structure of international music markets only serves to illustrate the importance of global distribution. Few states have sufficient domestic markets to support income for artists and producers. Even in these markets, the majority of sales for most major labels come from the global market. For developing countries, where the average income presents too small a market for most producers or artists[167], access to the global market is essential. As Menell notes, there are many international online outlets such as Garageband.com[168] and theorchard.com[169] that provide distribution, and marketing services, as well as retail services. This will significantly lower the barriers to distribution

---

[164] A Story, et al (eds) *The Copy/South Dossier : Issues in the economics, politics, and ideology of copyright in the global South* (Copy/South Research Group 2006) at 40. (Available at http://www.copysouth.org)

[165] See e.g. A Rens, A Prabhala, D Kawooya 'Intellectual Property, Education, and Access to Knowledge in Southern Africa' (2006) ICTSD Regional Research Paper Southern and Eastern Africa, at 31. (Available at http://www.iprsonline.org/unctadictsd/docs/06%2005%2031%20tralac%20amended-pdf.pdf last visited February 13, 2007)

[166] See Andersen, B. et al "Copyrights, Competition and Development: The Case Of The Music Industry" Discussion Paper No. 145 January 2000 UNCTAD, at 9, arguing that developing country artists may be able to take advantage of new technologies more easily as new entrants. (Available at http://www.unctad.org/en/docs/dp_145.en.pdf last visited February 13, 2007)

[167] Id.

[168] P Menell 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95, at 78. (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

[169] For other examples see UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 85. (Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)

and market access thus encouraging greater diversity and distribution of music. Digital technologies also makes it easier to record and produce music, bringing the production process closer to the artist, and therefore less dependent on specific producers with capital.[170] This may work to reduce the imbalance of power that generally exists in developing countries (and in developed countries) between artist/creators, on the one hand, and producers, on the other.[171] Where artists bypass the production of CDs and limit their distribution to purely online sales and to performance income revenues it is possible to bypass some of the major production costs of producing a record.[172] This also includes some of the major costs of reaching and marketing to a global audience.[173] In addition, many of the technologies that are used in production are available in FLOSS form, meaning that there is no cost for purchase or use beyond the human skills needed to learn how to use them.[174] In developing countries this is more likely to lead to the proliferation of smaller producers[175] as well as self-produced artists who will view such producers as service providers rather than owners. While the major studios have expressed concerns about selling music online without copying protections, more and more artists and producers have found that it is possible to make a viable living by online sales of music without technological protection measures. The approach has even been endorsed by Steve Jobs, CEO of Apple, the owner of the iPod and iTunes store brands that sell copy protected songs. Jobs notes rightly that such protections do not prevent unauthorized copying by those determined to do so, and limit the ability of artists to reach wider audiences through word of mouth and other viral forms of marketing.[176]

Digital distribution and marketing may also lower the transaction costs of collecting royalties and licence fees.[177] Sites such as theorchard.com provide such services as part of their package, thus eliminating the middleman of collection and licensing agencies. The possibility of direct access and control, or even automated systems for licensing mean that the present landscape of music copyright, which is oriented towards collection agencies and major labels, will shift towards providing more direct remuneration to artists.[178] As sites like theorchard.com proliferate, they will compete for artists to join their catalogues on price and services, without becoming copyright owners themselves. Direct "artist-to-consumer" transactions become increasingly possible.[179] The success of such a system, as Okediji points out, is also reliant on the ability to turn such online payments into money in the bank, which may still pose problems in developing countries whose banking systems may not yet be set up to receive electronic transfers or electronic deposits.[180] However, the use of internet banks based in the North may also serve to enable such transactions where local institutions lack the resources to do so.

---

[170] The advent of music synthesizers and the Musical Instrument Digital Interface (MIDI) standard system allowed greater independence for artists to produce high quality, complex, multi-track digital recordings. See UNCTAD "E-Commerce and Development Report" UNCTAD 2004, at 71.

[171] UNCTAD "E-Commerce and Development Report" UNCTAD 2004, 67.

[172] Id. at 69.

[173] Id. at 70.

[174] For a list of these see Id. at 79.

[175] Id. at 66.

[176] S Jobs "Thoughts on Music" February 6, 2007 available at http://www.apple.com/hotnews/thoughtsonmusic/ last visited February 13, 2007)

[177] R Okediji 'Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce' (ICTSD Geneva 2005) at 29 (available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf last visited February 13, 2007)

[178] *See* Andersen, B. et al "Copyrights, Competition and Development: The Case Of The Music Industry" Discussion Paper No. 145 January 2000 UNCTAD, at 9. (Available at http://www.unctad.org/en/docs/dp_145.en.pdf last visited February 13, 2007)

[179] For an extreme example of this see www.sheeba.ca the website and store of Jane Siberry a Canadian musician who left her record label and is selling her material directly to consumers, at whatever price consumers are willing to pay. The site is unusual in the payment aspects but is structured to profit from direct payments and the creation of mailing lists and a direct community to whom products can be marketed. However, it should be noted that she built up a following as an artist before she ventured along this path.

[180] R Okediji 'Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce' (ICTSD Geneva 2005) at 30. (Available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf last visited February 13, 2007)

In addition to music, the rich tradition of oral history and storytelling in developing countries may find a larger audience and access through digital production and distribution. While music appears to be the easiest point of entry for developing countries, any art form that is dominant in a developing country has the power to transform itself through new production and distribution methods.

VI.2.3 The Rights and Freedoms Necessary to Ensure Access and Development

The potential for growth in access and development through the new technologies is evident. The previous section suggested the outlines of what is needed for these to be fully realized. Technology always operates within a legal and social context that either enables its use or restricts it. The conditions necessary for developing countries to begin to take advantage of digital and internet content include ensuring:

- the right to free access and use of digital and internet content for: research or educational purposes; library and other non-profit informational purposes (such as museums); the right to import from or export to other countries for the same purposes;
- the right to reproduce, distribute, broadcast, perform, communicate to the public, lend (all without payment) for research, scientific, educational, library and other informational non-profit purposes (such as museums); the right to import from or export to other countries for the same purposes;
- the right to quote (without payment) reasonable portions of works;
- the right to access and use any non-copyright material regardless of format, structure or compilation of which it comprises a part;
- the right to impose compulsory licences for government or development purposes either for free, or at a price commensurate with local cost levels, uses and needs;
- the right of creators of cultural goods in developing countries to distribute their work through digital and internet channels, while ensuring that they are sufficiently rewarded for the creation of their works.

In particular, certain copyright and related policy options have to be in place:

a. Strong and robust education and library exceptions

For educational institutions to continue to fulfil and expand the role that they must play in development policy, they must be free to communicate information to their students. A broad exception for education must cover all educational uses of copyright and related rights materials. It must cover multiple analog copies of texts for use by students. It must enable students to make photocopies themselves of any material held by the school library for their private and educational use. All institutions must be able to make such copies electronically available to all students at the school, through a school network and from any workstation or computer, without further payments by the institution or the school.

A strong library exception is also crucial, especially for libraries operating within educational institutions. They must be enabled to make copies of the contents of their institutions for any bona fide member (student, teacher) of the institution. They must be able to digitize the contents of their library and share it with any bona fide member of their institution, as well as with other libraries serving the same function. They must be able to transfer their material into any format for archival and lending purposes.

While these exceptions may at first seem to pose a threat to developing country publishers of educational texts, such concerns should not create a situation where commercial actors are allowed to

place an unnecessary tax on education. Copyright is not the only, or even the most viable method for the production of educational textbooks. In the alternative for example, secondary school texts can be created on commission by the government, and required reading texts can be allowed to be accessed for free under the education exception. Whichever publisher wins the tender will have a head start but the text once created would be available to all other publishers to produce, ensuring that there is sufficient competition on price. This may increase the number of publishers rather than reduce them. Such a process seems far more preferable than one where one publisher has an almost unlimited monopoly on a text that is used in a national school system. With respect to tertiary institutions, the role of textbooks is also clear, but these are largely written by individuals who already have employment and are a way of disseminating knowledge and gaining status. Profits for the writer are not the primary driver of such production. In such a situation, developing countries may wish to either commission the development of free textbooks by their own professors and scholars, or to construct them by using free access under the education exception to create compilation texts. Especially in the context of tertiary education (e.g. science) developing countries should not re-invent the wheel if such texts are already available on the market and can be used for educational purposes. This is especially critical if such texts are available electronically. In such a case, protection would only require that the text be protected from commercial uses by other publishers but, that copies of the whole text or portion thereof by students are legitimate exercises of the education exception.

b. A robust research and study exception

A robust research and study exception is crucial to enable students to copy texts themselves, as far as the text has been legally accessed either at a library or through purchase. Countries should ensure that their domestic legislations are clear so as to allow students to photocopy portions or the whole for their own research and study purposes to the extent that they do not produce and distribute to others. In such cases, research comprises materials necessary for carrying out school assignments, papers or other education related tasks. Thus, a secondary school student doing a paper on Shakespeare would be allowed to make a copy of a text or portions of text (a critique perhaps), or copy of a film, that they would use and study as a basis for writing their papers. This exception would apply therefore, not just to post-graduate students but, to all students in pursuit of their studies, to the extent that they did not engage in commercial sale or distribution of copies that they have made. This exception is crucial to enabling students and scholars to carry out research and study without the fear of having to pay royalties on products that they have legally accessed, either through purchase, library lending, or otherwise. It will assist students and schools by preventing undue litigations and pressure from right-holders.

In addition, the research and study exception must also be embedded in a robust definition of ‘first sale’ so that individuals use their ownership material effectively. Here, the study and research exception overlaps with the traditional private use exception. The fear of literal copying and distribution should not encroach on the right of individuals to own what they have properly bought and paid for. This clearly applies a concept of ownership in the digital arena, such that an individual can transfer copies from one device to another, from their own hard drive to their work station, to a memory disk, onto paper, online storage, email and many other manipulations of such material for personal and study purposes. Although the principles are well established, it is crucial to establish that the exercise of rights conferred by copyright do not infringe upon private uses, uses under research and study and all other exemptions. Owners cannot control the uses of their material and force individuals or institutions to pay multiple times for material that they already own.

This issue of ownership is particularly important for institutions that make such purchases with the understanding that they will use such material for their institutional purposes. This would include archiving, and copies requested by professors or students, either analog or digital. To suggest that each institution buy copies for each individual member is to insist on disproportionate profit for the copyright holder. Some of the institutions, such as libraries, by their very nature acquire materials for the purpose of dissemination and wider use. The concept of ownership, especially by educational

institutions, must cover normal institutional uses of such material if educational institutions are to carry out their educational mission.

c. Does the Three Step test impose limitations on the scope of exceptions?

Least developed countries have until July 2013 to implement the TRIPS agreement (except for articles 3, 4 and 5).[181] The WCT and WPPT, and the proposed Broadcasting Treaty make no such provisions for transitional periods, although these agreements are voluntary to enter into.

However, the WCT and WPPT allow for the formulation of new exceptions and state that the three-step test neither limits nor expands the scope of exceptions under the Berne Convention. As other commentators have noted[182] this is a crucial re-balancing as it establishes that domestic legislation is free to apply existing exceptions and create new ones, provided that they are consistent with Berne. At least as far as digital and internet content is concerned the agreed statements cabin the three step test and place it in proper perspective as an open-ended enabling tool for crafting exceptions without actually pre-determining the scope of those exceptions beyond the Berne Convention.

In addition, existing decisions on the scope of the three-step test still leave the issue open for developing countries to develop practices of their own with respect to the standard provided by the test.[183] The standard was analyzed in the US Copyright case, in which the EU brought a challenge against Section 110(5) of the US Copyright Act.[184] The decision's analysis of 'special cases' 'normal exploitation' does not function as a precedent for new subject matter and was applied to a situation with a significant commercial and profit-making setting. In particular it has not addressed the normative power and role of education as an exception to copyright. The decision did not negate other existing practice in the United States and the EU on exceptions and limitations, which provides some broad and useful examples. It is especially important to note that, as a matter of international law, the post-TRIPS rights and subject matter embodied in the WCT and WPPT are not covered by the panel's interpretation of the three-step test under the TRIPS Agreement.

Developing countries should proceed to interpret and apply the test in their own legislation taking into account the entire scope of available state practice under the Berne Convention (including the extensive practice of European Union countries prior to and including the EU Copyright Directive) as well as taking the opportunity to establish new limitations and exceptions suitable to digital and internet content.[185] In addition, a study conducted by WIPO also points out that normative considerations as to the markets from which a rights-holder can legitimately expect to profit are a core part of the examination of the three-step test, including such considerations as education and free speech.[186]

---

[181] EXTENSION OF THE TRANSITION PERIOD UNDER ARTICLE 66.1 FOR LEAST-DEVELOPED COUNTRY MEMBERS, Decision of the Council for TRIPS of 29 November 2005 (30 November 2005) IP/C/40 http://docsonline.wto.org/ (last visited 15 Februrary 2006)

[182] P Samuelson, "The U.S. Digital Agenda at WIPO", (1997) 37 VA. J. INT'L L. 369.

[183] R Okediji "The International Copyright System: Limitations, Exceptions and Public Interest Considerations for Developing Countries" ICTSD 2005, at 20. (Available at http://www.iprsonline.org/unctadictsd/docs/Okediji_Copyright_2005.pdf last visited February 13, 2007)

[184] WTO Panel Report on United States – Section 110(5) of the U.S. Copyright Act, June 15, 2000, WTO Doc. WT/DS160/R, *available* at http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm#2000.

[185] A useful examination of what some of these state practices consist of can be can found in Section III of Ruth Okediji's "The International Copyright System: Limitations, Exceptions and Public Interest Considerations for Developing Countries' ICTSD 2005.

[186] S Ricketson "WIPO Study on Limitations and Exceptions Copyright and Related Rights in the Digital Environment" WIPO SCCR/9/7 2003, at 26. (Available at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=16805 last visited February 13, 2007)

VI.3 The Way Forward for Developing Countries

As an introductory matter, it is important to realize that innovation and development, especially with respect to developing indigenous industries is best served by copyright that is strong enough to prevent direct and literal copying for commercial purposes, but that is limited so as to enable sequential and interactive production of new goods and increased competition. In ensuring this, developing countries will also need to address the lack of access to educational materials for students and the majority of their population. With this in mind, the following agenda items are proposed for the developing countries as a way to begin to set the terms of the debate for themselves. They emphasise ways to retain and further access while simultaneously enabling development and growth for indigenous industries.

VI.3.1 Immediate Actions

A. Do not sign TRIPS-Plus, WCT and WPPT.

Developing countries should not sign such terms in bilateral treaties with the United States or the EU, even where they contain language similar to the agreed statements at the WCT and WPPT and they contain exceptions as allowed under Berne, TRIPS and general fair use principles. The implementation of such provisions in the United States and the EU has proven to be controversial and have not been shown to achieve their goals. Developing countries should not sign on to unproven and dangerous policies.

B. Those countries that have not signed the WCT and the WPPT should refrain from signing them. Those who have should reconsider their participation in the treaties.

Where they see a need for protection of the rights of their performers, such protection may be better limited to those provisions of the WPPT that they deem necessary and under strict domestic law and policy making. Those countries that have ratified the WCT and/or the WPPT should give serious thought to withdrawing their participation from the treaties.

C. Maintain and fully implement existing exceptions and limitations.

Access to digital and internet content for developing countries can only be built on a regime that ensures access to analog content. Developing countries must look to models that create the largest amount of freedom for analog content. This entails eschewing traditional models provided by technical assistance programmes from developed countries or WIPO and looking instead to alternative models such as the Tunis Model Law on Copyright for Developing Countries[187] to create more appropriate model laws. Developing countries should begin the discussion as to how it should be updated to accommodate developments since it was first written.

A priority should be the establishment of the widest and most useful education, library and personal use exceptions to enable educational access for teachers, institutions and students. While it is not within the remit of this paper to fully flesh out such exceptions, developing countries should focus on the production of further work in this area.

Developing countries should insist on the application and inclusion of existing limitations and exceptions in every international agreement, ensuring that they are not interpreted in any way as giving up their sovereign right to determine applicable limitations and exceptions for themselves.

---

[187] UNESCO and WIPO, Tunis Model Law on Copyright for Developing Countries, 1976. (Available in Hard Copy from WIPO, on request.)

D. Focus copyright enforcement on the protection of domestic artists.

Many enforcement programmes focus on border controls, reflecting the interest to respond to political demands from rich countries to the detriment of developing a holistic enforcement strategy that reflects balance in the IP system. Developing countries should place an emphasis on ensuring the remuneration of domestic creators/artists by domestic producers and other content industry intermediaries. The resources of developing countries are better spent supporting domestic artists than enforcing border controls for goods from developed countries.

E. Limit software copyright protection only to the non-functional aspects of software. Do not provide patent protection.

The example of the United States may be appropriate to follow; where courts for a long time have refused to extend copyright to those aspects of software that are the inevitable result of the functional requirements. The requirement to protect software as a literary work does not require that such protection be of equal strength as that for original literature.

The protection of object code as required under TRIPS must ensure that de-compilation of the object code is allowed. This is important to make the object code human-readable and allow others to determine its functionality, and/or reverse engineer it.

F. Do not extend protection to non-original databases.

There is little evidence to suggest that non-original databases need protection (as provided for instance, by the European *sui generis* regime) to provide an incentive for their creation, while it is clear that such protection would only serve to remove knowledge from the public domain. Even where copyright protection of original databases is required under TRIPS, such protection should impose a high burden of originality. Copyright protection should only be extended to the structure, not the contents, of the database.

VI.3.2 Next Steps

a. Negotiate Special Provisions for Educational Access for Developing Countries.

Building on the tradition and precedent of the Berne Appendix, developing countries must insist that the new technologies require a new instrument or set of provisions to ensure educational access for developing countries. While exceptions and limitations are good beginnings and stopgaps, bulk access to materials is really what is needed for developing countries. In this context a new deal for educational access is necessary. However, as Okediji warns, developing countries should beware of any suggestion that the Berne Appendix can be the only basis for bulk access to digital and internet content.[188]

b. Formulate new and appropriate limitations for digital and internet content that can be effectively utilised.

Developing countries should begin the process of formulating limitations and exceptions for digital and internet content in their domestic law. In this, developing countries have some natural allies in civil society groups in developed countries who share many of the same concerns about maintaining access for their own communities. In particular, educational and library institutions share their agenda and have made proposals with respect to access to educational materials that can form the basis of

[188] R Okediji 'Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce' (ICTSD Geneva 2005) at 32 (Available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf (last visited February 13, 2007).

legislation, appropriately tailored, for developing countries. In developing such new exceptions and limitations, developing countries will need to be fully cognizant of the application of the three-step test. In particular, defining what interferes with normal exploitation of the copyright may be difficult in the digital and internet arena. A good beginning would address the following issues in the near term:

- Limits on technological protection measures– users of TPMs must be required to enable access for educational and other public interest exceptions. In addition, the implementation of anti-circumvention measures for those states that have signed up to such commitments should be limited only to acts of circumvention, not tools, and only if such circumvention is for access to copyrighted material. Although countries may not ratify the WCT and WPPT nor implement TPM measures under domestic legislation, they need clear policy on TPMs due to the fact that the exercise of such rights affects access issues in the rest of the world.

- Exception for Search Engines – developing countries should ensure that their copyright law includes an exception for search engines which search, copy and catalogue the web and the internet, enabling users to find information easily. Those search engines that are free to use should be exempted from needed authorization to make copies, provided that the copies that they make are used only for searching and, that the links that they establish direct the user to the original content and not to the copies stored on the search engine server.

- Exception for ISPs and P2P and other service providers. Internet service providers should be treated the same as any other telecommunications service provider. Simply because their network may be used for holding or transmitting unauthorized material, ISPs should not be held liable. In the same manner, peer to peer sharing and distribution programmes should not be held liable for the material that individuals place on their systems. In the United States, ISPs have been held indirectly or secondarily liable for the activities of their users. Since such liability issues are free for countries to decide for themselves, developing countries should ensure that copyright liability is only available for direct infringement. If it is necessary to have such indirect liability for copyright infringement, such liability should be limited to those cases where the service provider knowingly and intentionally allows the specific alleged material to be placed or transmitted on its servers.

- Exceptions for Temporary, Incidental and Ephemeral copies. Since almost all computer programmes that manipulate and transmit information also make incidental copies, it is necessary to ensure that such copies are treated as exceptions and do not require a tax on every single action of a computer programme. This is especially important for web browsing. However, this is only a concern where the right of reproduction is considered to cover temporary copies. Fixation requirements may also be used to exclude temporary copies from protection by requiring fixation for more than a temporary period.

- No enforcement of unfair copyright licensing contracts. Developing countries should not recognise or enforce contracts that have terms that restrict or contract out of exceptions or fair use terms. As some commentators have rightly argued, the entire point of such exceptions and limitations is the public interest, and private contracts should not be allowed to contract around the public interest.[189] This is especially important in the area of software. They should be treated as null and void where they conflict with the public interest or where they render public interest exceptions and limitations inoperable. TRIPS makes no requirements to restrict the interpretation and operation of contract law.

[189] J Cohen 'WIPO Copyright Treaty Implementation in the United States: Will Fair Use Survive?', 21 EUR. INTELL. PROP. REV. 236, 240 (1999). (Available at http://www.law.georgetown.edu/faculty/jec/wipotreaty.pdf last visited February 13, 2007)

Developing countries must insist that new treaties, especially those addressing new subject matter, also include appropriately tailored exceptions and limitations. A prime example is the proposed WIPO Broadcasting Treaty which only includes provision for exceptions and limitations because of the urging and demands of developing countries.

c. Adopt and Support Free/Libre/Open Source approaches to software and other content.

As a general rule, developing countries have little to gain from proprietary regimes for knowledge basically produced in or otherwise controlled by actors in the developed countries. Especially in the field of digital and internet content, developing countries remain content users rather than providers. In such a situation where there is a need to both ensure access and to develop indigenous capacity, open source models of production and dissemination may be most appropriate. The most attractive feature of such an approach may be that it requires little or no additional legislation or international agreement to implement. Developing country governments should favour Open Source and Open Content approaches, devoting their resources to:

- the enforcement and use of open source licences;
- the use of open source software;
- the encouragement of open source approaches to the production and dissemination of knowledge in the scientific and education arena by leveraging government funding and not allowing the privatization and exclusive appropriation of materials produced with such funding.

Finally, it is important to reiterate that these recommendations must be seen in the light of a broader ICT policy that emphasizes access to hardware, in line with an access to knowledge policy. As an element of industrial and economic policy, these policies become part of a larger strategy. However, as this paper has emphasized, the area of earliest harvest for such policies both for ICTs and access to knowledge is in the education sector. An educated and skilled populace with access to information is a prerequisite for development and will be even more necessary in the future global economy of knowledge.

BIBLIOGRAPHY

Articles and Reports

- B Andersen et al, "Copyrights, Competition and Development: The Case Of The Music Industry" Discussion Paper No. 145 January 2000 UNCTAD. (Available at http://www.unctad.org/en/docs/dp_145.en.pdf last visited February 13, 2007)

- P Askerud, "The Distribution of Educational Materials: Problems and Issues" UNESCO 1997. (Available at http://unesdoc.unesco.org/images/0010/001090/109092E.pdf last visited February 13, 2007

- J Bessen & E Maskin, 'Intellectual Property on the Internet: What's Wrong with Conventional Wisdom?' Presentation at Harvard Information Infrastructure Project Conference 'Internet Publishing and Beyond : the Economics of Digital Information and Intellectual Property' January, 1997 (Revised 2004) (Available at http://www.researchoninnovation.org/iippap2.pdf last visited February 13, 2007)

- J Boyle, 'The Second Enclosure Movement and the Construction of the Public Domain' (2003) 66 Law and Contemporary Problems 33, 43. (Available at http://www.law.duke.edu/pd/papers/boyle.pdf last visited February 13, 2007)

- Y Braunstein, "Economic Impact of Database Protection for Developing Countries and Countries in Transition" WIPO Study, 7th Session of the Standing Committee on Copyright and Related Rights, SCCR/7/2, 2002 (available at http://www.wipo.int/edocs/mdocs/copyright/en/sccr_7/sccr_7_2.pdf last visited February 13, 2007)

- D Cogburn & C Adeya, "Prospects for the Digital Economy in South Africa: Technology, People, Policy and Strategies" UNU/INTECH Discussion Paper 2002. (Available at http://ideas.repec.org/p/dgr/unuint/200202.html)

- J Cohen, 'WIPO Copyright Treaty Implementation in the United States: Will Fair Use Survive?', 21 Eur. Intell. Prop. Rev. 236, 240 (1999). (Available at http://www.law.georgetown.edu/faculty/jec/wipotreaty.pdf last visited February 13, 2007)

- C Correa, "Implications of Intellectual Property Rights for the Access to and Use of Information Technologies in Developing Countries" Discussion Paper 2000/2 UNU-INTECH, International Workshop on the Information Revolution and Economic and Social Exclusion in Developing Countries, Maastricht, 23-25 October 1996. (Available at http://www.intech.unu.edu/publications/discussion-papers/2000-2d.pdf last visited February 13, 2007)

- CM Correa, 'Fair Use in the Digital Era' (2002) 33 IIC 570, 570 (Available at http://webworld.unesco.org/infoethics2000/documents/paper_correa.rtf last visited February 13, 2007

- J De Beer, "How Restrictive Terms and Technologies Backfired on Sony BMG" Internet & E-Commerce Law in Canada, Vol. 7, No. 1, March 2006, 2 (Available at http://ssrn.com/abstract=901305 last visited February 13, 2007

- S Dusollier, 'Exceptions and Technological measures in the European Copyright Directive of 2001- An Empty Promise' (2003) 34 IIC No. 1.

- RL Gana, 'Has Creativity Died in the Third World, Implications of the Internationalization of Intellectual Property' (1995) 24 Denv. J. Int'l & POL'Y 109, 120

- RL Gana, 'The Myth of Development, the Progress of Rights: Human Rights to Intellectual Property and Development' (1996) 18 Law & Policy No. 3 & 4, 331

- Ghosh et al., "Economic Impact of FLOSS on innovation and competitiveness of the EU ICT sector" UNU-MERIT Study Commissioned by the European Commission, November 2006, (Available at http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf last visited February 13, 2007)

- J Ginsburg, "Legal Protection of Technological Measures Protecting Works of Authorship, International Obligations and the US Experience" Columbia Law School Public Law and Legal Theory Working Paper Group, Paper No. 05-93, 2005. (Available at http://ssrn.com/abstract=785945 last visited February 13, 2007)

- M Heins, "The Progress of Science and Useful Arts: Why Copyright Today Threatens Intellectual Freedom" The Free Expression Policy Project, New York, NY 10001, (2003). (Available at http://www.fepproject.org/policyreports/WillFairUseSurvive.pdf last visited February 13, 2007)

- L Holson, "With Popcorn, DVD's and TiVo, Moviegoers Are Staying Home" New York Times, May 27, 2005.

- D Ibison, E Terazono and R Waters, "Norway declares Apple's iTunes illegal" Financial Times, 24 January 2007.

- P Menell, 'Envisioning Copyright Law's Digital Future' (2002) UC Berkeley School of Law Public Law and Legal Theory Research Paper Research Paper Series No. 95. (Available at http://www.nyls.edu/pdfs/v46n1-2p63-200.pdf last visited February 13, 2007)

- V Munoz & C Waitara, "A Development Analysis of the Proposed WIPO Treaty on the Protection of Broadcasting and Cablecasting Organizations" (South Centre Geneva 2007) (available at http://www.southcentre.org/publications/researchpapers/ResearchPapers9.pdf)

- C Neto, "Development Theory and Foundations of Universal Access Policies" Yale Law School Student Scholarship Series No. 12, 2005. (Available at http://www.is-journal.org/V02I02/2ISJLP365-Neto.pdf last visited February 13, 2007)

- R Okediji, 'Development in the Information Age: Issues in the Regulation of Intellectual Property Rights, Computer Software and Electronic Commerce' (ICTSD Geneva 2005) at 29 (available at http://www.iprsonline.org/unctadictsd/docs/CS_Okediji.pdf last visited February 13, 2007

- R Okediji, "The International Copyright System: Limitations, Exceptions and Public Interest Considerations for Developing Countries" (ICTSD Geneva 2005). (Available at http://www.iprsonline.org/unctadictsd/docs/Okediji_Copyright_2005.pdf last visited February 13, 2007)

- TW Oshikoya,. & MN Hussein, "Information Technology and the Challenge of Economic Development in Africa" African Development Bank Economic Research Paper No. 36, 2004.

(available at http://www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DOCUMENTS/ECONOMICSANDRESEARCH/ERP-36.PDF last visited February 13, 2007)

- B Oyelaran-Oyeyinka and C Adeya, "Internet Access in Africa: An Empirical Exploration" UNU/INTECH Discussion Paper 2002-5. (Available at http://www.intech.unu.edu/publications/discussion-papers/2002-5.pdf last visited February 13, 2007)

- M Radin, "Regulation by Contract, Regulation by Machine", 160 J. INSTITUTIONAL & THEORETICAL ECON. 1, 5 (2004). (Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=534042 last visited February 13, 2007)

- A Ratnakar, "World's Largest Open Access E-Journals Portal Launched" (2006) 90 Current Science 741

- A Rens, A Prabhala, D Kawooya 'Intellectual Property, Education, and Access to Knowledge in Southern Africa' (2006) ICTSD Regional Research Paper Southern and Eastern Africa, at 30. (available at http://www.iprsonline.org/unctadictsd/docs/06%2005%2031%20tralac%20amended-pdf.pdf last visited February 13, 2007)

- S Ricketson, "WIPO Study on Limitations and Exceptions Copyright and Related Rights in the Digital Environment" WIPO SCCR/9/7 2003. (Available at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=16805 last visited February 13, 2007

- P Samuelson, "The U.S. Digital Agenda at WIPO", (1997) 37 Va. J. Int'l L. 369

- S Siwek, "Copyright Industries in the US Economy: The 2004 Report" (International Intellectual Property Alliance, Washington DC 2004). (Available at http://www.iipa.com/pdf/2004_SIWEK_FULL.pdf last visited February 13, 2007

- A Story, 'Study on Intellectual Property Rights, the Internet, and Copyright' (Study Paper 5) in UK Commission on Intellectual Property Rights Final Report of the UK Commission on Intellectual Property Rights (2002) at 22 citing Reuters, 16 October 2001. (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

- A Story et al (eds.), "The Copy/South Dossier: Issues in the economics, politics and ideology of copyright in the global South" Copy/South Research Group May 2006. (Available at www.copysouth.org).

- UK Commission on Intellectual Property Rights Final Report of the UK Commission on Intellectual Property Rights (United Kingdom 2002) (Available at http://www.iprcommission.org/papers/pdfs/study_papers/sp5_story_study.pdf last visited February 13, 2007)

- UNCTAD "Development and Globalization: Facts and Figures" UNCTAD 2004. (Available at http://www.unctad.org/templates/webflyer.asp?docid=4848&intItemID=2364&lang=1 last visited February 13, 2007

- UNCTAD "E-Commerce and Development Report" UNCTAD 2004. Available at http://www.unctad.org/en/docs/ecdr2004_en.pdf last visited February 13, 2007)

- United Nations Development Programme Human Development Report (UNDP 2001) (available at http://hdr.undp.org/reports/global/2001/en/ last visited February 13, 2007)

- UNESCO "Open and Distance Learning: Trends, Policy and Strategy Considerations." UNESCO 2002 (available at http://unesdoc.unesco.org/images/0012/001284/128463e.pdf last visited February 13, 2007)

GLOSSARY OF TERMS[190]

◊ **Analog** - An **analog** or **analogue** signal is any variable signal continuous in both time and amplitude. It differs from a digital signal in that small fluctuations in the signal are meaningful. Analog is usually thought of in an electrical context, however mechanical, pneumatic, hydraulic, and other systems may also convey analog signals.

◊ **Binary** - Being in a state of one of two mutually exclusive conditions, such as on or off, true or false, 6 or not 6, or the presence or absence of an electrical pulse.

◊ **Bit** - A binary digit, generally represented as a 1 or 0.

◊ **Blog** - A personal or corporate website in the form of an online journal, with new entries appearing in sequence as they are written, especially as dealing with personal reflections or opinion.

◊ **CD Burners** - a device, usually found in a computer, for recording audio, or for saving data, onto a compact disc.

◊ **Chat room** - A computer site online where users can exchange messages by typing them onscreen which makes them appear to scroll by as a conversation develops with other users on the site.

◊ **Circumvention** - The act of evading by going around an obstacle.

◊ **Compact Disc** - A form of digital media that is based on the use of a laser to read from a plastic disc in a reader device known as a CD drive. It comes in several varieties including the CD-ROM (ROM=read-only memory) which cannot be written to except during manufacturing, the CD-R (recordable), which can be written to exactly once, and the CD-RW (re-writable), which can be written to as many times as one wishes (to a limit)

◊ **Compression** - the process of encoding information using fewer bits (or other information-bearing units) than an unencoded representation would use through use of specific and agreed encoding schemes. Generally, when compressed the data cannot be manipulated, but can be transmitted.

◊ **Computer microprocessor** - A microprocessor is a programmable digital electronic component that incorporates the functions of a computer's central processing unit on a single semi conducting integrated circuit or 'chip'.

◊ **Compulsory licensing** – a legal obligation imposed on a patent or other intellectual property holder to allow others to use the protected product for free, or at a price determined by the legal authority.

◊ **Decompile** - to translate a file containing information at a relatively low level of abstraction (usually designed to be computer readable rather than human readable) into a form having a higher level of abstraction (usually designed to be human readable).

◊ **Derivative products** – these are products based on an existing expression, such as a film sequel.

---

[190] Unless otherwise noted, terms have been captured and/or adapted from Wikipedia or Wiktionary at www.wikipedia.org or http://en.wiktionary.org/wiki/Wiktionary:Main_Page

◊ **Digital** - A digital system is one that uses discrete values (often electrical voltages), especially those representable as binary numbers for input, processing, transmission, storage, or display, rather than a continuous spectrum of values (i.e., as in an analog system).

◊ **Digitization** - Digitizing or digitization is representing an object, an image, or a signal (usually an analog signal) by a discrete set of its points or samples, rather than a continuous signal.

◊ **Download** - to download is to receive data from a remote system, such as a website, FTP server, or other similar systems. A download is any file that is offered for downloading or that has been downloaded.

◊ **DVD** - "Digital Versatile Disc" or "Digital Video Disc" is an optical disc storage media format that can be used for data storage, including movies with high video and sound quality. DVDs resemble compact discs as their diameter is the same (120 mm (4.72 inches) or occasionally 80 mm (3.15 inches) in diameter), but they are encoded in a different format and at a much higher density.

◊ **Encryption** - the process of obscuring information to make it unreadable without special knowledge, sometimes referred to as scrambling.

◊ **Fibre-optic cables** - An **optical fibre** (or **fiber**) is a glass or plastic fibre designed to guide light along its length by total internal reflection. Optical fibres are widely used in fibre-optic communication, which permits digital data transmission over longer distances and at higher data rates than other forms of wired and wireless communications.

◊ **File sharing** - the practice of making files available for other users to download over the Internet and smaller networks.

◊ **File Transfer Protocol** - File Transfer Protocol (FTP) is used to connect two computers over the Internet so that the user of one computer can transfer files and perform file commands on the other computer. Specifically, FTP is a commonly used protocol for exchanging files over any network that supports the TCP/IP protocol (such as the Internet or an intranet).

◊ **Hard disk** - A hard disk (commonly known as a HDD (hard disk drive) or hard drive (HD) and formerly known as a fixed disk) is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces.

◊ **Hardware** - Computer hardware is the physical part of a computer, including the digital circuitry, as distinguished from the computer software that executes within the hardware. The hardware of a computer is infrequently changed, in comparison with software and data, which are "soft" in the sense that they are readily created, modified or erased on the computer.

◊ **Internet** - The Internet is the worldwide, publicly accessible network of interconnected computer networks that transmit data using the standard Internet Protocol (IP). It is a "network of networks" that consists of millions of smaller domestic, academic, business, and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer, and the interlinked Web pages and other documents of the World Wide Web.

◊ **LP** - A vinyl 33 rpm long-playing record album, or LP album, the main type of gramophone record predominant immediately before the rise of digital music.

◊ **Meta-sites** – a ‘site of sites’ that collects and enables links to many, if not all websites within a particular subject matter.

◊ **Multimedia** - media that uses multiple forms of information content and information processing (e.g. text, audio, graphics, animation, video, interactivity) to inform or entertain the (user) audience. *Multimedia* also refers to the use of (but not limited to) electronic media to store and experience multimedia content

◊ **Network** - A computer network is two or more computers connected together using a telecommunication system for the purpose of communicating and sharing resources.

◊ **Object code** - object code is the representation of human readable computer code (source code) into binary code readable and directly executable by the microprocessor. All source code must be 'compiled' into object code before a microprocessor can execute its instructions.

◊ **Open source software** - refers to any computer software whose source code is available under a licence (or arrangement such as the public domain) that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified form. It is often developed in a public, collaborative manner.

◊ **Optical disc** - a flat, circular, usually polycarbonate disc whereon data is stored in the form of pits (or bumps) within a flat surface, usually along a single spiral groove that covers the entire recorded surface of the disc. This data is generally accessed when a special material on the disc (often aluminium) is illuminated with a laser. The pits distort the reflected laser light.

◊ **Pixel** - A pixel (short for picture element, using the common abbreviation "pix" for "picture") is a single point in a graphic image.

◊ **Public domain** – the volume of information and ideas that is accessible and can be used, copied, transformed and distributed without the requirement of payment or authorization by an intellectual property rights-holder. The public domain is the basis for further creation and innovation.

◊ **Ripping** - Ripping (also referred to as digital audio extraction) is the process of copying the audio or video data from one media form, such as DVD, HD DVD, Blu-ray or CD, to a hard disk. While the original media is typically digital, the extraction of analog media such as VHS video or vinyl records to a digital format can also be referred to as "ripping".

◊ **Spyware** - Spyware is computer software that collects personal information about users without their informed consent. The term, coined in 1995 but not widely used for another five years, is often used interchangeably with adware and malware (software designed to infiltrate and damage a computer respectively). Personal information is secretly recorded with a variety of techniques, including logging keystrokes, recording Internet web browsing history, and scanning documents on the computer's hard disk.

◊ **Software** - Software, or programme, enables a computer to perform specific tasks, as opposed to the physical components of the system (*hardware*). This includes application software such as a word processor, which enables a user to perform a task, and system software such as an operating system, which enables other software to run properly, by interfacing with hardware and with other software or custom software made to user specifications.

◊ **Source code** - source code is any sequence of statements and/or declarations written in some human-readable computer programming language.

◊ **Sui generis** - a Latin expression, literally meaning *of its own kind/genus* or unique in its characteristics. In reference to law, it is the creation of a special set of rules for a particular subject matter outside of general civil or criminal law.

◊ **Webcasts** - Webcasting is sending audio and/or video live over the Internet. In essence, webcasting can be thought of as broadcasting over the Internet.

◊ **Website** - A collection of linked webpages, which are a representation of information combining text and images suitable for the World Wide Web and accessed through a web browser such as Internet Explorer. Web pages may be retrieved from a local computer or remotely over a network.

◊ **World wide web** - a system of interlinked, hypertext (linked) documents that runs over the Internet. With a Web browser, a user views Web pages that may contain text, images, and other multimedia and navigates between them using hyperlinks.