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Computer Programs

Introduction

7.1 Computer technology plays an increasingly important role in modern society. Computers — electronic machines with a capacity to store and/or process data — are called “hardware.” The development of hardware is astonishing: computers are more potent and computer technology enters more areas of life, not only in technological environments and offices (their initial stronghold), but also in more mundane surroundings such as household appliances, cars, watches and similar products.

7.2 A computer cannot operate without instructions. These instructions (programs) may be embedded into the hardware (the computer itself), for example in ROMs (Read Only Memory, circuits from which digital information can be retrieved), but most often they are created, reproduced and distributed in media which are separate from the computer hardware. Typically, computer programs for personal computers are distributed on diskettes, or CD-ROMs. Usually, computer programs are created in a programming language which can be understood by people trained in that language. That form of appearance of the program, which can be on the computer screen or printed out on paper, is normally referred to as the “source code.” Another form of appearance is the so-called “object code,” where the program is transferred (“compiled”) into the digital values “0” and “1.” In this form the program is unintelligible for persons, but it is machine-readable, for example from a diskette, and in that form it can be used actually to control the operations of the computer.

7.3 Usually the computer hardware and the programs need to be supplemented by manuals and other support material, prepared by the producer of the program, which provide the necessary instructions and reference material for more advanced uses of the program. The program and such reference material and manuals (together with the more technical background material which rests with the producer) are referred to as computer software.

7.4 The investment needed for the creation of computer programs is often very heavy, and their protection against unauthorized copying and use is of crucial importance. Without such protection, producers of computer programs would not be able to recoup their investment, and so the creation and development of this decisive side of computer technology would be jeopardized. In countries which have not yet provided sufficient protection, it is frequently only possible to obtain foreign programs which are not adapted to the specific needs of those countries, because it is difficult to secure the financing of the necessary translations and local adaptations. Also, computer viruses tend to be much more widespread in countries with insufficient protection, because they are distributed with pirated software which is not subject to the same quality control as authorized products.

7.5 Therefore, it is vital for national legislation to ensure sufficient protection of computer programs. Even in cases where local translations or adaptations are not necessary, such protection improves access to the most advanced and the best suited software, since producers and distributors are only reluctantly releasing their valuable products in countries where rampant piracy can be expected.

Brief History of the Protection of Computer Programs

7.6 During the 1970s and the first half of the 1980s, intensive international discussions regarding the protection of computer software took place, mainly aiming at resolving the question of whether such protection should be under copyright or patent law, or possibly under a *sui generis* system of protection.

7.7 A Committee of Experts convened jointly by WIPO and Unesco in February – March 1985 marked a decisive breakthrough in the choice of copyright as the appropriate form of protection of computer programs, which can be assimilated to literary works. A few months later, several countries passed legislation clarifying that computer programs were considered works, subject to copyright protection, and since then it has been generally accepted worldwide that copyright protection should be applied rather than a *sui generis* approach.

7.8 There are important reasons for choosing copyright protection. First of all, computer programs are basically writings and, under Article 2(1) of the Berne Convention, the purpose for which writings are created is irrelevant from the viewpoint of their qualifying as literary works, if they are original intellectual creations.

7.9 Although computer programs as literal expressions can be protected under copyright, if ideas behind the computer programs embrace technical features providing technical solutions, then the expression of those ideas could be patentable subject matter.

Protection of Computer Programs under Patents

7.10 Article 27.1 of the TRIPS Agreement requires that patents be available in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application, subject to certain limited exceptions. This broad requirement of patentability has prompted a discussion of the subject of where to draw the line between copyright and patent protection for computer programs.

7.11 In many countries, software-related inventions are patentable subject matter if they have a technical character or involve technical teaching, i.e., an instruction addressed to a person skilled in the art on how to solve a particular technical problem using particular technical means. In other words, software-related inventions should have a technical effect. Provided that the software produces a technical effect, it is then necessary to examine whether the conditions of patentability are fulfilled.

Protection of Computer Programs under Copyright

7.12 Computer programs in object code form share the copyright status of other literary and artistic works stored in computer systems in machine-readable form. While they are unintelligible in object code, they can be retrieved — “decompiled” — into source code form where they are intelligible. It is generally recognized that all categories of works are protected against storage in digital form, because such storage is a reproduction, and in this respect it does not matter that, for

example, a musical work cannot be perceived directly from a CD, but only after a “decompilation” has taken place in a CD-player.

7.13 The normal prerequisite for copyright protection, that a work must be original, is well suited to be applied to computer programs. Although most programs consist of sub-routine elements which often in themselves would hardly qualify as original works, the combination of such elements and the structuring of the programs — with the exception of a few very simple programs — make them sufficiently creative. Ideas and abstract methods for solving problems (the so-called “algorithms”) are not protected under copyright, which limits the protection to the expression of such ideas and algorithms, but this is actually a desirable consequence of copyright protection: an appropriate protection is offered without creating unreasonable obstacles to the independent creation of such programs.

7.14 It has been argued that the term of protection for literary works, that is, 50 years after the death of the author, under the Berne Convention, is too long in relation to computer programs, because such programs usually become outdated in a much shorter time. The same argument applies to several other categories of literary and artistic works. The reality is that if a work is obsolete, it will not be used and therefore, protection will also not be invoked. The term under the Berne Convention should be considered nothing other than an upper limit for those works which actually remain of interest to users.

International Norms Concerning Copyright Protection of Computer Programs

7.15 The international consensus regarding copyright protection of computer programs has been reflected in two international treaties, namely Article 10(1) of the TRIPS Agreement and Article 4 of the WIPO Copyright Treaty (WCT). While slightly different in wording, these two provisions both state that computer programs should be protected as literary works, and that the protection should be the same as that granted to such works under the Berne Convention. This does not exclude that national laws may categorize computer programs as a separate category of works, provided that the level of protection is not lower than that granted to literary works under the Convention. The TRIPS Agreement also clarifies that the protection applies to computer programs “whether in source or object code”, while the WCT expresses the same in a less technical form: “Such protection applies to computer programs, whatever may be the mode or form of their expression.”

National Legislation on Copyright Protection of Computer Programs

7.16 A number of important issues that should be addressed in modern copyright laws are analyzed below in the light of the prevailing international trends.

7.17 It is a clear trend today that national laws expressly include computer programs as protected works of a kind, more precisely as writings, and thus there is no doubt that copyright protection applies to such programs, provided that they are original. Not all national laws define computer programs, and some of the definitions differ in their wording, but a fairly generally applicable definition would be “a ‘computer program’ is a set of instructions expressed in words, codes, schemes or in any other form, which is capable, when incorporated in a machine-readable medium, of causing a computer — an electronic or similar device having information-processing capabilities — to perform or achieve a particular task or result.” This definition reflects all the essential elements of the notion of computer programs.

7.18 The significance of this categorization of computer programs as literary works (writings), depends on other relevant provisions of the respective laws and on the practice adopted in subsequent court decisions. It should be kept in mind that this categorization of computer programs indicates that the level of originality required as a prerequisite for protection should not be different from that required for other writings. It is important, however, that commercially valuable programs are not denied protection because of excessively high demands concerning originality in the expression of the programs.

7.19 The protection of computer programs as writings entails, furthermore, that the rights pertaining to copyright protection also apply to such programs. In particular, the right of reproduction, the right of distribution of copies and the right of communication to the public should be applicable.

7.20 The most important issue concerning the right of reproduction in copyright laws is the question of in which cases it is justified to permit reproduction without the authorization of the right-owner. The international norm which is applicable is Article 9(2) of the Berne Convention. According to this provision, national laws may permit reproduction of literary and artistic works in certain special cases, provided that such reproduction does not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interests of the author. The views of professional circles concerning this provision, when applied to computer programs, are ambiguous, and governments having legislated or planning to legislate in this field do not always agree.

7.21 The question is: in which special cases does the free reproduction of computer programs not conflict with normal exploitation or unreasonably prejudice the legitimate interests of copyright owners, and in which special cases can it therefore be allowed?

7.22 Although differing views still exist, there seems to be growing agreement concerning free copying for private purposes, taking into account the purpose and value of computer programs — except for cases covered by the points below — should not be allowed; free copying by lawful owners, that is, persons who have acquired ownership of copies of (not of the copyright in) computer programs should be allowed in certain circumstances; free decompilation of computer programs (see discussion of this issue, below) may also be allowed under certain conditions. It should be added, however, that in the latter aspect, there is less than general agreement.

7.23 It is obvious that copying should be allowed if it is indispensable for the use of a program in conjunction with a machine for the purpose, and to the extent of use for which the program has been lawfully obtained. Furthermore, it also seems justified to allow making a “back-up copy” for archival purposes, as a security measure, for cases where the replacement of the program may become necessary. In addition to clarifying the extent to which a lawful owner of a computer program may make a copy, it also seems necessary to make it clear that the right of adaptation under Article 12 of the Berne Convention does not include the right to prevent an adaptation that is indispensable for using the computer program in conjunction with a machine for the purpose, and to the extent of use, for which the program has been lawfully obtained.

7.24 Decompilation of computer programs means reproduction and adaptation (“translation”) of computer programs into a form in which the coding and structure of the program can be examined and analyzed. According to certain views, such decompilation by lawful owners of computer programs should be allowed, since it would not conflict with any normal exploitation of the program and would not cause any unreasonable prejudice to the legitimate interests of copyright owners, in cases where decompilation is needed to obtain information necessary to achieve interoperability of independently created programs with the original programs concerned.

However, to avoid any conflict and prejudice referred to above, the information thus obtained should not be used for the development, production or distribution of a program substantially similar in its expression to the original program, or for any other act infringing copyright. It is a difficult task to formulate legal provisions in respect of decompilation, because of the very strong interests involved.

7.25 The Berne Convention contains few rules concerning the right of distribution, that is, the right to control not only the initial sale of copies of the work, but also subsequent distribution of such copies, for example through rental or lending. This right, however, has become increasingly important, not least as far as works embodied in digital media, including computer programs, are concerned. Such works can be copied without any deterioration of their technical quality. If they were made generally available free of charge or for a modest payment, even for a limited period of time, they would be subject to widespread copying by the general public. Realistically, it would not make much difference in this respect that such reproduction might not be permitted without the authorization of the owner of the rights. This means that it has become necessary for the right-owners to be able to prevent others from distributing copies of computer programs, for example, through rental or lending, because such distribution would disrupt the market for copies distributed through sale. There is a growing consensus that all such distribution should be subject to the authorization of the right-owners.

7.26 The right of communication to the public is also gaining importance in relation to computer programs. New communication techniques are being developed which will enable high-speed digital delivery of works from databanks to individual users. This will, of course, influence many different kinds of works and not only computer programs. However, such delivery systems are actually used for computer programs (also broadcasting of such programs has occurred in practice). These systems represent a substantial and very valuable use of such programs and as the development in this field is extremely rapid, modern legislation should ensure that exclusive rights of communication to the public, including broadcasting and the making available in interactive systems, should also apply to computer programs.

7.27 Among the other general rules of the Berne Convention that are important in relation to computer programs (as well as other works) the principle of protection without formalities (Article 5(2) of the Convention) should also be mentioned. Some national laws provide for registration systems, but normally registration is not a condition for the protection, but rather establishes rebuttable presumptions concerning authorship or ownership of rights, and, therefore, such provisions are not incompatible with the Berne Convention.

7.28 A general problem in a number of national laws is the term of protection. As there are no exceptions in the Berne Convention concerning computer programs, the term should be the general rule of 50 years after the end of the year in which the author died.

Creation and Use of Works by Means of Computers

7.29 The data processed by a computer, or the data that result from such processing, may well be protected literary and artistic works. This gives rise to some important questions in relation to the copyright protection of such works, such as:

- where the information processed by a computer is expressed in a work protected by copyright, is the use of that work by the computer under the control of the copyright-owner?

- Where a computer has been used to process information in such a way as to produce a work of a kind normally protected by copyright — for example, the processing of statistics so as to produce them in tabulated form designed to serve a particular purpose, or the use of a computer to produce music — who is to be regarded as the “author”, and hence the copyright-owner, of the resulting literary or musical work?

7.30 Both internationally and nationally, there has been a very large measure of agreement on the answers, and the general consensus is recorded in the Report of the Second Committee of Governmental Experts on Copyright Problems Arising from the Use of Computers for Access to or the Creation of Works — convened by WIPO and Unesco in Paris in June 1982. The major conclusions recorded in the report and the recommendations may be summarized in the following way:

- the input of a protected work into a computer system includes the reproduction of the work on a machine-readable material support, and also the fixation of the work in the memory of the computer system; both these acts (i.e. reproduction and fixation) are governed by the international conventions (Article 9(1) of the Berne Convention); the output of a protected work from a computer system should be protected under copyright law, irrespective of the form of the output, for example, as a hardcopy printout, a fixation in machine-readable form, a transmission from the database of one system into the memory of another system (with or without an intermediary fixation), or by making the work available to the public by audio or visual images presented on a screen;
- in amending or modifying national legislation to take account of computer use of protected works, care should be taken to ensure that authors’ moral rights should continue to be exercisable in relation to computer use, and that the exemption and limitations on the copyright owner’s right of control, which computer technology might render desirable, do not exceed the limits on such exemptions permitted by the Conventions;
- non-voluntary licenses in relation to the computer use of protected works should only be adopted when voluntary licensing is impracticable, and should, in any case, be in accordance with the convention principles; and where a non-voluntary license is adopted by a national law, its effect should be confined to the territory of the country of that law.

7.31 In many countries the existing law appears to be regarded as implementing these general conclusions, but in some countries there have been specific amendments to the copyright law to put the matter beyond doubt.

7.32 The general view which emerged from these studies is that no matter how sophisticated a computer may be, it is only a tool, and the author of a work produced by the aid of a computer is the person who conceived the product and who gave the programmer and the technician the instructions necessary to produce it. Neither the programmer who designed the program and needed to operate the computer for the purpose of producing that work, nor the technician who operated the computer when carrying out the task, would be regarded as the author or a joint author; however, where the work of the programmer amounted to collaboration with the originating creative person to such an extent that the programmer contributed creatively in settling the form of the final product, he might be regarded as a co-author.

Databases

7.33 As mentioned above, the storage of protected works in computer memories is a reproduction which falls within the right of reproduction. Another question is, whether databases as such enjoy protection under copyright.

7.34 Article 2(5) of the Berne Convention provides as follows: "Collections of literary and artistic works such as encyclopaedias and anthologies which, by reason of the selection and arrangements of their contents, constitute intellectual creations shall be protected as such, without prejudice to the copyright in each of the works forming part of such collections." The provision does not indicate any specific category of works to which the level of protection shall be assimilated. Accordingly, it should be assumed that the level of protection to be granted is that which, in general, is granted to literary and artistic works under the Berne Convention.

7.35 The said provision in Article 2(5) of the Berne Convention limits its scope to original collections of literary and artistic works. This does not mean, however, that there is no basis in the Berne Convention for the protection of original collections of other material, such as data.

7.36 A basis can be found in Article 2(1) of the Berne Convention, which states, *inter alia*, that "The expression 'literary and artistic works' shall cover every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression." While the list of categories of works that follows the sentence just quoted does not include databases, it is clear that the list is not exhaustive, and a general consensus is emerging that every (original) production in the above-mentioned domain must be protected under the Convention.

7.37 An explicit provision on the protection of databases was included in Article 10(2) of the TRIPS Agreement. That provision states as follows: "Compilations of data or other material, whether in machine-readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself."

7.38 The WCT contains in its Article 5 a provision on copyright protection of databases, which, under the title "compilations of Data (Databases)" provides as follows: "Compilations of data or other material, in any form, which by reason of the selection or arrangement of their contents constitute intellectual creations, are protected as such. This protection does not extend to the data or the material itself and is without prejudice to any copyright subsisting in the data or material contained in the compilation." The Diplomatic Conference which adopted the WCT also adopted, by consensus, the following agreed statement: "The scope of protection for compilations of data (databases) under Article 5 of this Treaty, read with Article 2, is consistent with Article 2 of the Berne Convention and on a par with the relevant provisions of the TRIPS Agreement." Article 2 of the WCT, to which the agreed statement refers, states, under the heading "Scope of Copyright Protection": "copyright protection extends to expressions and not to ideas, procedures, methods of operation or mathematical concepts as such."

7.39 The originality requirement, for example, as under the WCT, that the database "by reason of the selection or arrangement" of its contents, means that some databases are not protected, even if they are of a considerable size and have been expensive to prepare. Such is, for example, the case where a database is exhaustive, that is, it contains all the relevant data without any selection or omission, and the data is arranged according to basic, straightforward rules, such as alphabetically, or in numerical or chronological order. Such bases may, however, still represent

substantial investments, and when stored in machine-readable form, they may easily and inexpensively be downloaded, copied and otherwise used.

7.40 It has been argued that such investments should also be protected, for example, by a *sui generis* right, covering copying, distribution and communication to the public, albeit for a shorter period than under copyright protection. The possibility of such *sui generis* protection is under discussion internationally.

Biotechnology

Introduction

7.41 Biotechnology is a field of technology of growing importance. Biotechnological inventions may have a very significant effect on our future, in particular in the fields of medicine, food, agriculture, energy and protection of the environment.

7.42 Biotechnology concerns living organisms, such as plants, animals, seeds and microorganisms, as well as biological material, such as enzymes, proteins and plasmids (which are used in “genetic engineering”). Biotechnological inventions fall into three categories: processes for the creation or modification of living organisms and biological material, the results of such processes, and the use of such results.

7.43 Biotechnology is one of the oldest technologies. For example, the production of wine or beer involves processes using living organisms, and such processes have been known for a long time. Likewise, the selective breeding of plants and animals has an equally long history.

7.44 In more recent times, scientists have developed biological processes to modify the genetic composition of living organisms (genetic engineering). For example, the microorganisms created by Chakrabarty (an inventor in the United States of America) were able to break down components of oil pollution in oceans and rivers. The patent on these microorganisms was the subject of a landmark decision by the United States Supreme Court, in which modified microorganisms were recognized as patentable subject matter. The Court noted that the laws of nature, physical phenomena and abstract ideas were not patentable. The claimed invention, however, was not directed to an existing natural phenomenon but to new bacteria with markedly different characteristics from any found in nature. The invention therefore resulted from the inventor’s ingenuity and effort. The United States Congress had defined statutory subject matter (any new article of manufacture or composition of matter) broadly to “include anything under the sun that is made by man.”

7.45 Genetic engineering processes are also used in the modification of microorganisms and plants for the production of new medicines. Biotechnology is expected to lead to important breakthroughs in medicine which may be effective in combating diseases such as cancer and AIDS. It may also lead to new opportunities for obtaining food and energy, and may provide solutions to the problems of pollution of the environment.

7.46 In many circles, the concept of invention was thought to be limited to the fields of physics and chemistry. However, with the increased ability to control and describe processes and products in the field of biotechnology, the concept of invention was enlarged to cover biotechnological

inventions. If it is possible to control a biotechnological process and to describe such a process in a way that experts in the field can carry out on the basis of the description, then an invention in the field of biotechnology has been made.

7.47 Today, biotechnology concerns the application of cellular and molecular biology to human needs and the use of cells and biological molecules to solve problems or make useful products. It includes scientific and industrial disciplines directed to understanding and manipulating living or biologically active material at the molecular level. Often it refers to recombinant deoxyribonucleic acid (DNA) techniques and analysis of genetic information.

7.48 The list of industries using biotechnology has expanded to include health care, agriculture, food processing, bioremediation, forestry, enzymes, chemicals, cosmetics, energy, paper making, electronics, textiles and mining. This expansion of applications has led to significant economic activity and development.

7.49 The number of modern biotechnology-based drugs has expanded and vaccines have increased. The genomes of a number of organisms have been sequenced, including human, mosquito and the malaria-causing organism, *plasmodia falciparum*. These and related developments are expected to accelerate the pace of drug and vaccine discoveries.

7.50 The area of farmland planted with transgenic crops has increased dramatically in recent years. This growth is expected to continue as more countries commercialize transgenic crops. Biotechnology has also been used to reclaim wasteland through the use of microorganisms and plants that remove or degrade toxic compounds.

7.51 This trend is encouraged by the positive impact of transgenic crops in reductions in pesticide applications and increased yields. Cassava, potatoes and rice are among the crops benefiting from alliances between institutions in developed and developing countries interested in generating products specifically for developing nations.

7.52 A recent report of the United Nations (shown in the Bibliography of this volume) summarized trends in the use of biotechnology, giving some definitions and detailed statistics.

Adoption and Dissemination

7.53 Developed countries have been the main investors in biotechnology and the principal beneficiaries of its adoption. Developing countries, however, are increasingly adopting this new technology, as illustrated by the use of genetically modified plants in increasing numbers of developing countries.

7.54 Cuba and India, for instance, are becoming centers of health-related biotechnology research, development, production and marketing. Cuban biotechnology institutions have developed or are developing vaccines, drugs and diagnostic kits for tropical diseases. Singapore and China have also focused on research in biotechnology and development projects in the health and agricultural sectors.

7.55 International public-private partnerships for vaccines and drug development are also of interest to developing countries. These are currently focused on developing drugs and vaccines against malaria, HIV/AIDS and tuberculosis with the aim of making final products affordable to developing countries. At least one vaccine is currently undergoing the first phase of trials in Kenya,

another, targeting HIV, is undergoing initial clinical trials in the United States and a malarial vaccine is undergoing the first phase of trials in the Gambia.

7.56 Industrial applications of biotechnology have occurred in textiles, wood, pulp, leather, food and mineral processing. South Africa developed a biotechnology-based gold-processing system, using microorganisms in hydrolyzing mineral ore, called the Biox process. The use of biotechnology in industry is expected to increase in developed and developing countries.

7.57 Development and adoption of intellectual property policies that balance public and private interests can help bridge gaps in the adoption and beneficial development of biotechnology in economies. Enhanced access to intellectual property systems by those working in developing countries, for instance, and stable, strategic partnerships between developed and developing countries are steps that can be taken.

7.58 Modern, flexible intellectual property systems and policies have contributed to fostering investment needed to establish biotechnology industries creating tangible products. Flexible intellectual property policies can play a role in favoring stable legal environments conducive to public-private partnerships, investment and other economic activity needed to spread biotechnological innovations to more countries.

Need for Protection

7.59 As in other fields of technology, there is a need for legal protection in respect of biotechnological inventions. Such inventions are creations of the human mind just as much as other inventions, and are generally the result of substantial research, inventive effort and investment in sophisticated laboratories. Typically, enterprises engaged in research only make investments if legal protection is available for the results of their research. As with other inventions, there is an obvious need for the protection of biotechnological inventions, not only in the interest of inventors and their employers, but also in the public interest in order to promote technological progress.

7.60 Legal protection of inventions is normally effected through the grant of patents or other titles. However, inventors in the field of biotechnology are faced with several obstacles when seeking protection for their inventions. These obstacles do not exist to the same degree in other areas of technology.

7.61 The first is the problem of whether there really is an invention rather than a discovery. If, for example, a microorganism as yet unknown is isolated by a sophisticated process, it may be argued that such a microorganism is not an invention but is a scientific discovery. The counter-argument would be that the isolation requires an important intervention by man using a highly sophisticated process, and that therefore the result is a solution of a technical problem. It may also be argued that the isolated microorganism is not different from a chemical substance extracted from nature, which is patentable subject matter.

7.62 The second obstacle is the existence of express legislative provisions that exclude certain categories of biotechnological inventions from patent protection, in particular, for reasons of public order and morality. Those provisions have their origin in developments which took place in Europe, but have also influenced countries outside Europe.

7.63 Although not all questions have been answered yet at the international level, a number of legal issues with respect to patent protection for biotechnological inventions have been addressed.

The EC Directive on the Legal Protection of Biotechnological Inventions, for instance, is an example of an instrument that may prove useful to countries and policymakers. The Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, concluded in Budapest in 1977, facilitates the processing of biotechnology inventions where protection is sought in various countries. Details on this Treaty are given in Chapter 5.

Existing Protection

7.64 Patents are the most commonly used form of legal protection for encouraging biotechnological innovation and commercialization, although trade secret protection may also be available. Legal regimes other than patent systems are typically relied upon to address other public interests such as the environmental or medical safety of products, efficacy of products, and unfair competition.

7.65 Many countries are bound by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), as part of their obligations as Members of the World Trade Organization (WTO). Analysis of TRIPS goes beyond the scope of this chapter (see Chapter 5) but in general, WTO Members are required to implement agreed minimum standards of intellectual property protection. This has given rise to discussions and debates about intellectual property systems and policies in countries that had previously not focused closely on these topics. Not surprisingly, there have been and continue to be concerns over issues such as the scope of patentable subject matter, what constitutes prior art, and how to implement patent-granting systems without unduly burdening struggling economies.

7.66 Article 27.1 of the TRIPS Agreement requires that patents be available in all fields of technology, without discrimination, provided that they are new, involve an inventive step and are capable of industrial application. Article 27.2 enables a Member to exclude from patentability inventions whose commercial exploitation may be contrary to public order or morality. Further, Article 27.3 also allows Members to exclude from patentability certain subject matter, such as plants and animals.

7.67 Protection does need to be provided, however, for microorganisms. In this context, there has been some concern over the impact of patents on “research tools,” in terms of freedom of action for research and development. This focuses on how patents are used and function in commerce. Studies available on this matter have not found widespread or insurmountable difficulties.

7.68 Concerning protection of plant varieties, Article 27.3(b) of the TRIPS Agreement provides that plant varieties shall be protected either by patents or by an effective *sui generis* system or by any combination thereof. Some plant variety protection systems are thought to constitute *sui generis* systems. Such systems differ from patent protection in the conditions required for protection and the nature of acts that can be prevented. The International Union for the Protection of New Varieties of Plants (UPOV) is explained in Chapter 5.

7.69 Flexibility has been necessary in TRIPS implementation. Deadlines for compliance, for instance, were recently extended to 2016 for least-developed countries. Other countries have worked to ensure compliance by 2005. In August of 2003, the WTO General Council agreed on changes that enable developing countries lacking pharmaceutical manufacturing capabilities to import drugs with fewer restrictions arising from patent rights. This agreement reflects efforts by

the international community to balance the rights of intellectual property holders and the need for access to certain drugs in developing countries.

7.70 Examples of approaches taken by various countries can be referred to that may be useful for policy-makers. The EC Directive 98/44 on the Legal Protection of Biotechnological Inventions, for instance, which entered into force on July 30, 1998, harmonized the rules concerning patent protection for biotechnological inventions. Article 3(2) provides that biological material, which is isolated from its natural environment or produced by means of a technical process, may be the subject of a patentable invention even if it previously occurred in nature. Article 4(1) excludes from patentability plant and animal varieties and essentially biological processes for the production of plants or animals. As regards public order and morality, Article 6(2) provides a non-exhaustive list of inventions which should be considered unpatentable. These are processes for cloning human beings, processes for modifying the germ line genetic identity of human beings, uses of human embryos for industrial or commercial purposes and processes for modifying the genetic identity of animals which are likely to cause them suffering, without any substantial medical benefit to man or animal, and also animals resulting from such processes.

Traditional Knowledge

Introduction

7.71 A section in Chapter 2 discusses intellectual property and traditional cultural expressions (TCEs), also termed expressions of folklore. More recently, international intellectual property policy debate has broadened its focus to consider the related issue of traditional knowledge (TK), and particularly how traditional knowledge may be protected through the intellectual property system. Increasingly, traditional knowledge is considered as the content, substance or idea of knowledge (such as traditional know-how about the medicinal use of a plant, or traditional ecological management practices), as distinct from the form, expression or representation of traditional cultures (such as a traditional song, performance, oral narrative or graphic design), which are known as TCEs or expressions of folklore. This section reviews the current debate about traditional knowledge protection, which is at a more exploratory stage but is nonetheless an area of high policy priority for many countries, and is under active consideration within WIPO as well as several other international organizations.

7.72 Holders of Traditional Knowledge, such as indigenous and local communities, have stressed that there is a holistic relationship between their traditional knowledge, the genetic resources (such as plants) which form part of their environment, and the TCEs or expressions of folklore that reflect their cultural identity. The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (the IGC) was established in 2001 to address these issues in a comprehensive way, and has therefore considered the protection of both traditional knowledge and TCEs, together with intellectual property aspects of genetic resources.

7.73 The call for protection of traditional knowledge through the intellectual property system raises challenging questions. To begin with, what is traditional knowledge? Can the astonishing diversity of indigenous and local intellectual and spiritual traditions be bundled together into one single definition, without losing the diversity that is their lifeblood? And what is meant by "protection" what is to be protected, and what is it to be protected from, for what purpose, and for whose benefit? If there are to be rights in traditional knowledge, who should own the rights, and how should they be enforced?

7.74 In addressing these issues, the IGC's work on traditional knowledge protection has also highlighted deeper concerns. For instance, there are concerns that attempts to protect traditional knowledge within the intellectual property system could turn traditional knowledge into an asset sought by third parties, thereby separating it from the very communities that create and nurture it, and consequently depriving them of vital benefits. So communities have maintained that any protection of traditional knowledge should remain true to its spiritual, scientific and legal roots. For many communities, the ancestral customary laws and practices that determine how knowledge should be protected are integral to the knowledge itself: traditional law and knowledge form an indivisible whole. Should these roots – the community life, the traditional practices and beliefs that are integral to traditional knowledge – be protected just as much as the intellectual and cultural fruits they have yielded?

Traditional Knowledge and the Intellectual Property System

7.75 This means that the search for traditional knowledge protection can amount to a fundamental reassessment of the basic principles and assumptions of the intellectual property system, and a complex debate about how traditional knowledge relates to the formal concepts and structures of the modern intellectual property systems. Some argue that intellectual property facilitates the assertion of illegitimate property rights over material derived from traditional knowledge. But practice has shown how intellectual property systems can strengthen the authority of the holders of traditional knowledge and associated genetic resources, and can help to define and structure how their intangible assets are used and the benefits equitably shared.

7.76 Much depends on opening up more practical options to indigenous and local communities, and enhancing their capacity for benefiting from their options. This poses the crucial question: what is the immediate need? Is it to create new forms of legal protection for traditional knowledge, to strengthen communities' capacity for making use of existing mechanisms or to build coordinated links between development and adaptation of legal systems and practical capacity-building?

Traditional Knowledge and the Global Marketplace

7.77 The debate about traditional knowledge protection has come to a head because of the increased perceived value of traditional knowledge in the global marketplace. Traditional knowledge and associated genetic resources have been drawn on to create new products, pharmaceuticals and agricultural products. In addition, the cultural, spiritual and technological dimensions of many traditional knowledge systems have survived, often adapting to the challenges of contact and interaction with modern technological society: traditional knowledge remains part of the life of many living communities, and should not be relegated to the archives as a historical curiosity. Certainly, traditional knowledge is a new concept in international intellectual property. WIPO initiated work on traditional knowledge in 1998, and the Convention on Biological Diversity, a landmark in the recognition of traditional knowledge in international law, was concluded in 1992.

7.78 Yet traditional knowledge constitutes some of humankind's oldest intellectual traditions and systems of knowledge and belief. Technical know-how, TCEs and the natural environment interact and interplay in a complex manner, finding expression in customary practices, community laws and ethical standards. For some traditional communities, customary law creates a vital link between access to and custodianship of traditional knowledge, and a sense of responsibility to respect, preserve and use it appropriately. These forms of knowledge, law and custodianship long predate the emergence of modern intellectual property law. So one concern is to respect and safeguard these traditional legal concepts and traditional knowledge management systems. Traditional wisdom has also been vital for the conservation of the natural environment, and is an essential source of information about the preservation and sustainable use of biological resources. It is

therefore no coincidence that the first recognition of traditional knowledge as such in an international legal setting was in relation to the conservation of biological diversity.

Challenges For the Future

7.79 Future development of traditional knowledge protection therefore confronts a number of seeming paradoxes:

- this is a strikingly new area of international cooperation in intellectual property, but it concerns knowledge and systems of knowledge that have deep and ancient roots;
- it is an international issue, marked by a search for global solutions, but it concerns traditional knowledge systems that are highly diverse and are inherently embedded in local customary law and the natural environment;
- traditional knowledge and the formal legal means of protecting it are seen as different things (just as an invention and the patent which protects it are distinct concepts), but for indigenous communities, having traditional knowledge and also having the responsibility for safeguarding it and using it according to customary law form an indivisible whole.

7.80 International progress on traditional knowledge protection is currently at a crossroads. The debate has already yielded a much clearer shared understanding of the basic ideas and concepts for traditional knowledge protection, and a more focused understanding of what the policy choices are. Several specific initiatives have already enhanced the practical recognition of traditional knowledge within the patent system, so that traditional knowledge is less likely to be the subject matter of ill-founded patent claims. The possibilities for protecting traditional knowledge through existing legal tools, including the law of confidential information (traditional knowledge as undisclosed technical know-how), geographical indications (some products are literal embodiments of geographically-localized traditional knowledge) and patent law (over 20,000 patent applications have been filed in China for innovations in the field of traditional Chinese medicine). In addition, several countries have introduced *sui generis* protection of traditional knowledge, and this practical experience is helping to guide understanding of what further legal steps are needed to prevent the misappropriation and misuse of traditional knowledge.

7.81 The use of existing and new intellectual property approaches alone will not resolve the challenges confronting traditional communities today, who will need to draw on a range of legal and practical tools to strengthen respect for the customary laws that protect their traditional knowledge. Yet there are grounds for optimism that judicious use of the intellectual property system can be a useful support for these communities, and can contribute to their cultural and economic well-being and autonomy. Practical experience, in turn, should lead to greater understanding of what new legal measures are needed, at the national and international levels.

Reprography

Reprography and Intellectual Property

7.82 Reprography is the generic term now used to describe all the kinds of photocopying equipment currently available, which enable facsimile copies of documents of every kind to be

made instantly and cheaply on apparatus that is simple to operate. Today, in almost all countries, such equipment is ubiquitous, and very large numbers of copies of literary, dramatic, musical and artistic material are made through the use of reprographic equipment around the world.

7.83 Article 9 of the Berne Convention (Paris Act 1971) stipulates that “authors of literary and artistic works protected by this Convention shall have the exclusive right of authorizing the reproduction of these works, in any manner or form,” and all contemporary copyright laws contain provisions implementing this principle. Paragraph (2) of Article 9, however, empowers national copyright laws to permit the reproduction of works in certain special cases, subject to two conditions:

- the permitted reproduction must not conflict with the normal exploitation of the work;
- the reproduction must not unreasonably prejudice the legitimate interests of the author.

7.84 Photocopying on the scale which exists today appears to conflict with the normal exploitation of those works, which are copied in such large numbers; and such a volume of copying may unreasonably prejudice the legitimate interests of the author and, of course, his publisher. A variety of solutions to the problem have been adopted in different countries.

7.85 In the 1970s, in some of the Scandinavian countries, a voluntary blanket licensing scheme, initially in respect of national works only, was instituted to cover photocopying in educational establishments. Subsequently, in the 1980s, in some of these countries the copyright law was amended so as to give statutory backing to this blanket licensing approach; under the statutory provisions the ambit of the blanket license was extended to all copyright works, including foreign works, with a provision for arbitration to deal with disputes arising between the organization administering the blanket licenses and the educational establishments covered by them.

7.86 In Germany a more advanced and comprehensive system has been instituted by amendments to the principal Copyright Act, a dual one of statutory payments together with blanket licensing. The statutory payments are made by the manufacturers and importers of photocopying equipment, the amount of the payment depending on the speed of operation of the equipment. In addition, when equipment of this kind is used in educational establishments, in public libraries or in other institutions which make the equipment available to the public on payment of a charge, copying royalties are to be collected and distributed by collecting societies under the blanket licenses.

Audio and Video Recording

7.87 Technological advances have made possible the high-quality copying of sound and audiovisual recordings. The copyright implications of this activity are the same as in the case of the copying of literary and other material by reprographic equipment — in other words it is a potential infringement of the fundamental right protected by Article 9 of the Berne Convention and by the provisions in national laws which implement that Convention requirement.

7.88 Home recording has also been the subject of very considerable study at national and international levels; a number of countries have enacted or are considering legislation to deal with the matter.

7.89 Just as in the case of reprography, the various national solutions adopted are not identical, but they are all based on more or less the same approach which may be summarized in the following way:

- the basic idea underlining the approach generally adopted is that in respect of each unit of recording equipment, blank tape, or recordable compact disc (CD), of a kind likely to be used for home recording, and which is released to the public, a statutory payment should be collected;
- the rationale of this approach is that although it is not possible to identify each individual home user, nevertheless it is possible to identify the users as a class because they are those persons who buy the equipment and the blank tapes or CDs by means of which home recordings are made; the payment takes the form of an element in the purchase price of the equipment, blank tape and CD bought for the purpose;
- also, as it is the manufacturers and importers of the equipment, blank tape and recordable CD who, by making those items available to the public, make it possible for the public to use authors' works in this way, it is reasonable to require the manufacturers and importers to collect the statutory payment and account for it to the copyright owners;
- under these schemes the statutory payments — which in some countries are charged on the equipment only, in some on the blank tape and sometimes recordable CDs only, and in some on both — are made by the manufacturers and importers to collective agencies representing the various categories of interested parties entitled to a share in them; the collective agencies are responsible for distributing the amounts so received.

7.90 The differences between the various national schemes relate principally to the following matters:

- the extent to which the total amount of statutory payments is distributed to individual right-owners and other interested parties, or is applied to social purposes. In some countries virtually 100% is distributed on an individual basis, whereas in other countries a proportion, which in some cases may be 50%, is applied to general social purposes — such as the granting of scholarships to authors and composers;
- the extent to which the copyright owners of non-national works (but which are protected under the copyright law of the country) are entitled to participate in the distribution of the statutory payments; in some countries all national works from other countries belonging to the same Convention to which the country in question belongs, are entitled to participate; in other countries only national authors and other interested parties participate.

Communication Technologies

Introduction

7.91 Communication technologies, which started with the transmission of sound only, began to serve the public on a significant scale in the first and second decades of the 20th century. For 30 or 40 years thereafter, broadcasting was simply the transmission through the ether by wireless means

of electromagnetic signals which, when received by suitable apparatus, could be converted into sounds and visual images audible to, and perceivable by, human ears and eyes. Progressively, from the mid-20th century to its end, the more sophisticated communications methods by satellite and cable (described below) were important developments. Finally, from the 1990s, electronic commerce and the Internet revolutionized communication technologies.

Satellites

7.92 In the middle of the 20th century, a significant development took place in the field of broadcast communications. Instead of the electromagnetic signals emitted by the original broadcast traveling directly — that is, without any man-made intervening assistance — from the original transmitter to the receiver, the transmitted signals were received first by a satellite placed in orbit some 22,500 miles above the earth's surface. The satellite traveled at a speed and direction which kept it, in effect, motionless in relation to the earth in what is known as a geostationary orbit. From this satellite the received signals would then be transmitted back to earth where, at first, for technical reasons, they were receivable only by ground stations, but increasingly have become receivable by private receiving sets owned and operated by individual members of the public. This has meant that both radio and television programs originating in, and transmitted from, one country, are receivable in many other countries; indeed, some of the footprints of these satellites may cover as much as one-third of the earth's surface.

Types of Satellites

7.93 Traditionally, one distinguishes between three types of telecommunication satellites: point-to-point, distribution and direct broadcast satellites, the first two of which are also referred to as communication satellites or fixed service satellites.

7.94 Point-to-point satellites are used for intercontinental communication between one emitting point and one or more receiving points. Their signals cover roughly one-third of the earth's surface, so that with the aid of three such satellites, placed over the Atlantic, Indian and Pacific Oceans, signals from any country in the world can be transported — if necessary via double hop — to just about any other country in the world, provided that the necessary earth stations are available. These earth stations must be very powerful and in consequence are very expensive.

7.95 Distribution satellites cover smaller geographical areas (e.g. Europe or part of the United States of America), and their signals are generally destined for a multiplicity of receivers (such as broadcasters or cable system operators) spread out over that particular area. The signal is more concentrated and more powerful than that from a point-to-point satellite, and in consequence the earth stations required for receiving signals from such satellites are considerably smaller — and cheaper — than those needed in a point-to-point satellite communication system.

7.96 Direct broadcast satellites are instruments which transmit programs that are intended for direct reception by the general public. They are "ordinary transmitters hung up in space," with all the advantages that such a bird's-eye view carries with it.

7.97 Originally, fixed service satellites and direct broadcasting satellites were clearly distinct, because they operated on different frequency bands, allocated for each purpose. The development of inexpensive and efficient satellite reception equipment for use by private households has blurred that distinction, because a large number of satellites now transmit programs intended for direct reception by the general public, using frequency bands that were previously reserved for fixed

service satellites. Therefore, it has become more common in modern legislation to include, under the term "satellite broadcasting," satellites operating on frequency bands which are reserved for closed, point-to-point communication, if the circumstances in which individual reception of the signals takes place are comparable to those which apply in the case of direct broadcasting satellites. Thus, for example, if equipment to decode signals is available to the general public with the consent of the originator of the transmissions, such transmissions will normally be deemed broadcasts, rather than closed point-to-point transmissions.

Copyright and Satellites

7.98 Satellite broadcasting raises a large number of problems of considerable interest in the copyright field. Under Article 11**bis**(1) of the Berne Convention, broadcasting is one of the forms of communication to the public that is covered by the rights granted under that Convention, and since that provision grants authors of literary and artistic works the rights to "broadcasting of their works or the communication thereof to the public by any other means of wireless diffusion of signs, sounds or images," it is obvious that satellite broadcasting is covered by those rights.

7.99 In most cases, the signals are sent to the satellite from one specific country (or from extraterritorial waters or other places outside the jurisdiction of any country), but they can be received in two or more countries. First of all, it must be determined which law or laws apply to such international transmissions; is it the law of the country from which the transmission originates only, is it the law of the countries in which it can be received, or is it — where applicable — both? This question is of particular interest in those cases where, under Article 11**bis**(2) of the Berne Convention, non-voluntary licenses apply in one country, for example the country from which the transmission originates, but not in others, for example the country or countries where the transmission is received. Another question concerns the identification of the relevant right-owners in those cases where the rights have been granted on a territorial basis, and where there are different owners of the rights in the country where the transmission originates and in the country or countries where it can be received.

7.100 A consensus seems to be emerging that the applicable law is that of the country from which the transmission originates. However, in those cases where the transmission originates from a country which does not grant exclusive broadcasting rights, there seems to be a tendency towards stretching the international applicability of national legislation as much as possible, in order to avoid to the extent possible the use of countries without copyright protection, or with inadequate protection, as "safe havens."

7.101 As regards the question which owners of territorially divided rights can exercise their rights concerning international transmissions, the solution is first and foremost to be found in well coordinated international contracts which do not leave any doubt in that respect. As regards the rights that are administered by collective management organizations, the International Federation of Societies of Authors and Composers (CISAC) had adopted a rule according to which it is the society in the country in which the transmission originates that is empowered to give the necessary authorizations, but under an obligation to consult in advance the societies in the "footprint" of the satellite regarding issues of special interest to those societies, including the distribution of royalties between different owners of territorially divided rights.

7.102 Frequently, satellite broadcasters use encryption technology to limit the reception of their programs. They may, for example, broadcast a high-value program which is financed through subscription fees from the viewers, and in this case the equipment necessary to decode the program (that is, to make it visible and audible) is only furnished to the subscribers, for example, in the form of a "smart card" — a microprocessor installed in a card, to be inserted in the receiver's decoding

apparatus. Later, if payments cease, the decoding equipment can “close” the program for that individual viewer, by means of special technical signals transmitted to the smart card alongside the transmissions of the program. Such technology can also be used to limit the distribution of programs geographically, by limiting access to decoding equipment to subscribers in certain geographical areas. Even though the encryption technology is becoming more and more advanced, there have been substantial problems with unauthorized smart cards being produced by pirates and distributed widely, to the detriment of the broadcasters and — as a consequence — the owners of rights in the works broadcast.

7.103 The WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) address this problem by obliging the States party to those treaties to provide adequate legal protection and effective legal remedies against the circumvention of such technological protection measures. It is fully justified to consider such unauthorized production, import and distribution of smart cards as a kind of copyright piracy, and national legislation should respond with the same efficiency as it does to the well-known “classical” forms of piracy.

Cable Distribution

7.104 Cable distribution systems have existed for many years on a small scale, typically as so-called “community antennas” which served one or a few apartment blocks and thereby replaced the numerous antennas which previously were erected by the inhabitants themselves. Also, in areas where mountains or high buildings made reception difficult or impossible, such systems enabled reception in the “shadow areas” by means of a single, often high and well-placed antenna.

7.105 Eventually, and particularly in the 1980s and 1990s, these systems evolved significantly, both technologically in terms of their capabilities of carrying a multitude of programs, either from terrestrial broadcasting, satellites, or even programs fed directly into the cable systems (“cable originated programs”), and quantitatively in terms of the size of the systems and their share of the total number of households in the various countries. In more and more regions of the world, cable television has become a commercial activity of significant importance.

7.106 The dissemination of works and other protected subject matter in cable systems is a communication to the public. However, the status of such communication under the Berne Convention depends on whether the program is cable-originated or a broadcast. In the former case, which also includes programs which are transmitted by satellite to the cable system, provided that such satellite transmission is “closed” and therefore not a broadcast in itself, the applicable provisions of the Berne Convention are:

- Article 11, which grants exclusive rights for communication to the public of performances of dramatic, dramatico-musical and musical works;
- Article 11*ter*, which grants exclusive rights to authors of literary works for communication to the public of recitations of their works;
- Article 14, which grants authors of literary and artistic works an exclusive right of communication to the public by wire of works adapted and reproduced in audiovisual works;
- Article 14*bis*, which grants the same right to the owner of copyright in an audiovisual (cinematographic) work.

In addition, it should be noted that Article 8 of the WIPO Copyright Treaty (WCT) grants a right of communication to the public, by wire or wireless means, for all categories of works. In practice, this means that exclusive rights must be granted as regards cable-originated programs.

7.107 As regards cable retransmissions of broadcasts, the provisions of Article 11**bis** of the Berne Convention applies. According to paragraph (1) of this Article, authors of literary and artistic works shall enjoy the exclusive right of authorizing any communication to the public by wire or by rebroadcasting of the broadcast of the work, when this communication is made by an organization other than the original one. This limitation means that when the conditions and payments for broadcasts are negotiated, due attention must be paid to the extent of the communication made by the broadcaster, be it as original broadcasting, rebroadcasting or cable distribution.

7.108 Paragraph (2) of Article 11**bis** provides that national legislation may “determine the conditions under which [these rights] may be exercised, but these conditions shall apply only in the countries where they have been prescribed. They shall not in any circumstances be prejudicial to the moral rights of the author, nor to his right to obtain equitable remuneration which, in the absence of agreement, shall be fixed by competent authority.” This provision means that non-voluntary license schemes may be established for cable retransmission of broadcasts. While such schemes can be found in some national laws, there seems to be a tendency towards giving right-owners a stronger bargaining position by granting them exclusive rights, rather than just a right of remuneration. At the same time, it is often recognized that it is necessary to shield cable operators from individual claims from right-owners, because the cable operators have no influence on the contents of the broadcasts that they retransmit, and in practice cannot cut off the retransmission whenever a work is broadcast to which they have not acquired the retransmission rights. One way of doing this is to establish compulsory collective management of the retransmission rights, whereby the cable operators can settle all questions regarding the retransmission rights by entering into agreements with collective management organizations.

Digital Distribution Systems

7.109 One of the most fundamental technological developments relating to the protection of copyright and related rights in recent decades is the use of computers and digital networks for storage, transmission and use of works. On the Internet, text, graphics, photographs and sound can be exchanged between computers at the click of a button, and real-time transmission of audiovisual works is also possible. As new business models are developed to make use of these technical possibilities, the Internet is increasingly taking a central position in the dissemination of works and other protected subject matter to the general public. Especially when networks are so powerful that they can disseminate audiovisual works in real time (or even faster than real time, in which case they will be stored by the receiver and viewed once or more in real time, during and after the transmission) to become accessible to ordinary consumers, such transmission has become an important means of distribution. It is possible that digital distribution may largely replace, for example, distribution of audiovisual works on videocassettes or DVDs.

7.110 Such a development raises several important questions relating to the protection of copyright and related rights, including the question of whether such a transmission “on demand” to, for example, a private home entails a “communication to the public” which is covered by the exclusive rights of the right-owners. Other important questions are the legal protection of the various encryption systems that are necessary to control the dissemination of the works against manufacture and distribution of unauthorized decoding devices, and the legal protection of such rights management information which it is necessary to attach to the works when transmitted, not

least in order to ensure a correct feedback for billing purposes and, eventually, for the purpose of securing a correct distribution of the payments to the right-owners. Important answers to the questions raised in this connection are given in the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT), which are discussed in detail in chapter 5 above.

The Internet

7.111 The Internet is a global system of connected networks that operate together by virtue of the use of common protocols, established through an open standard-setting process. The Internet is founded on an open, non-proprietary protocol known as Transport Control Protocol/Internet Protocol (TCP/IP), and uses a standard coding system, hypertext markup language (HTML), for representing data in graphical form on the World Wide Web. The Internet has rapidly evolved from a scientific and academic network into a network whose most popular application, the World Wide Web, has enabled it to become widely adopted since the 1990s. It is the open nature of this network, along with its multifunctional character and increasingly low-cost access, which has galvanized the potential for electronic commerce. At the same time, however, the open network is providing access to a digital environment in which multiple perfect copies of text, images and sounds can be easily made and transmitted, and trademarks easily misused, posing new challenges for intellectual property owners.

Electronic Commerce

7.112 The “digital age,” in which the Internet has played a critical role, has seen dramatic and rapid communications, economic and social developments. The technological innovations that initiated these changes have also fuelled the new digital economy, reflected in new financial markets and trade flows, innovative models for business, as well as new opportunities for creators and consumers.

7.113 The remarkable scope of these developments has made electronic commerce a subject of significant economic, policy and social importance. Commerce conducted across electronic media is not new. However, the advent of the Internet, the “network of networks” using open standards, has given rise to a prodigious international expansion in the number of users and range of applications relevant to our daily lives. There are currently more than half a billion users, accessing more than 2 billion pages of information available via the World Wide Web. In many regions of the world, it has begun to change significantly the ways in which individuals, companies and governments organize their affairs, interact and conduct business.

7.114 The term “electronic commerce” has achieved widespread recognition, becoming a highly visible symbol in the contemporary language of information and communication technology that brought profound changes in the final years of the last millennium. The words are commonly used in the media, in business and in conversation to refer to activities associated with the use of a computer, or other network-accessible device, and the Internet to trade goods and services in a new, direct and electronic manner. There has been tremendous growth in the value of commercial transactions on the Internet; starting from zero in 1995, total electronic commerce is estimated to have grown to around 433 billion US dollars in 2000 and 1.9 trillion US dollars in 2002 and is expected to reach some 6 trillion by 2004.

7.115 While individuals do engage in transactions over the Internet (business-to-consumer, or B2C), most of the growth in electronic commerce is driven by the less visible business-to-business sector or B2B. Here the Internet is acting as a powerful means for improving the quality of management and service, thereby enhancing existing or establishing new customer and supplier relationships, while bringing new efficiency and transparency to operations. It is an excellent mechanism for reducing costs all round, including those associated with production, inventories, sales execution, distribution and procurement.

7.116 Two defining characteristics of electronic commerce can be noted. First, there is its international character. The electronic means described above have created a global medium without borders, so that any business offering goods or services on the Internet need not target a specific geographical market. Instead, the establishment of a commercial website can provide even a small business with access to markets and Internet users worldwide. The second characteristic is the interdisciplinary nature of electronic commerce, and the corresponding impact that this brings to the forces of convergence. Both large and small enterprises are finding that some of the traditional lines between business sectors — which have been founded on the different physical manifestations for the goods or services offered and the different physical means for their distribution, for example, books, films, CDs, television, radio and web broadcasts — are becoming less clear. This is generating new competitive pressures for restructuring within and across industries, confronting businesses with opportunities as well as challenges.

7.117 Within the commercial sphere, issues of intellectual property that have had such relevance in the physical (off-line) world, involving rights in respect of patents, trademarks and copyright, among others, also arise in relation to electronic commerce, but with different aspects to be addressed and, in many cases, shorter periods of time. Trademarks, for example, which provide consumers with an accessible symbol associated with the goodwill of an enterprise, are playing an important role in the electronic commercial environment where personal dealings are infrequent. With respect to patents, the creative business methods that are being developed to conduct commerce over the digital networks raise new questions of patentability. Further, the shorter life cycles of many of the products and services associated with the Internet and digital technologies call for the timely acquisition and enforcement of such intellectual property rights.

7.118 There is a further distinction of particular relevance to intellectual property, especially to copyright and related rights, in respect of commerce on digital networks: as noted, the Internet facilitates both commerce in physical products and commerce in intangible products. For commerce involving physical products, the Internet functions as a global system facilitating sales, in which the placing of an order and the making of payment can (but does not necessarily have to) take place on-line, while the goods themselves are delivered separately through a postal or other delivery service. For commerce involving intangible products, the Internet serves not only as a system to promote sales, but also as a system to effect the delivery of the intangible product itself, such as a piece of music or software, a film or a publication. This distribution can take place almost instantaneously, and the intangible product may travel virtually without restriction across national borders. Indeed, this aspect of electronic commerce may be its most compelling dimension: there is an inherent logic to using the Internet to buy and sell intangible products that need never be more than an integral part of the flow of communication by digital means. At the same time, however, there is a commensurate need for effective intellectual property protection that can address the international dimensions of this commerce.

7.119 Already, the largest segment of business-to-consumer electronic commerce involves intangible products that can be delivered directly over the network to the consumer's computer, such as entertainment, travel, news, e-mail and financial services. While these intangible products, by their very nature, are difficult to measure, an increasing amount of the content that is being

offered is subject to intellectual property rights. This commerce in intangible products raises a number of issues for intellectual property, in addition to those that would arise in respect of physical goods. For example, there is a growing role to be played by technological measures and digital rights management systems in protecting the rights of intellectual property owners. In addition, questions of the scope of rights and how existing law applies, jurisdiction, applicable law, validity of contracts and enforcement become more complex when the products offered do not necessarily have a physical manifestation.

A Complementary Approach to the Development of Intellectual Property Norms

7.120 Reference has been made in chapter 5 (under Progressive Development of International Intellectual Property Law) to the need for a new approach, in order to accelerate the pace of measures to meet intellectual property challenges. The traditional and more long-term approach of international treaties between States has been complemented by consultations and the establishment of various advisory bodies: the aim is that representatives of member States, of intergovernmental organizations and of non-governmental organizations should join together to help member States to establish priorities and coordinate activities in finding means to protect, administer and enforce intellectual property rights. In order that the concepts and practices of intellectual property find an environment where they can function optimally, WIPO has also undertaken activities to reach out to all levels of society, including the general public.

WIPO Internet Domain Name Processes

7.121 The two WIPO Internet Domain Name Processes provide examples of the innovative means by which international norms have been developed and implemented by WIPO. The WIPO Processes were initiated at the request of certain of WIPO's Member States, to study and develop recommendations for the prevention and resolution of conflicts that involve intellectual property rights in the Internet Domain Name System (DNS). Domain names are the user-friendly forms of Internet protocol address that allow messages to be routed via the Internet and have gained increasing importance as business identifiers in online commerce.

7.122 The WIPO Processes were conducted through a combination of Internet-based and personal consultations throughout the various regions of the world, in a balanced and transparent manner. WIPO endeavored to obtain wide geographical and sectoral participation, and to reach the broadest possible consensus in its recommendations, so that the interests of all Internet stake-holders could be taken into account and practical workable solutions found to the real problems that had been identified.

7.123 The first WIPO Process commenced in June 1998, to address the relationship between domain names and trademark rights and to study means of preventing and resolving disputes arising from the abusive and bad-faith registration of domain names that include trademarks, a practice known as "cybersquatting." The first WIPO Process resulted in a report, published in April 1999, setting out WIPO's recommendations. These recommendations resulted in the implementation by the Internet Corporation for Assigned Names and Numbers (ICANN) of a Uniform Dispute Resolution Policy and Rules (UDRP) to resolve domain name disputes involving trademarks, and in the development of a system of best practices for domain name registration

authorities to avoid such conflicts. The WIPO Arbitration and Mediation Center was accredited by ICANN to provide dispute-resolution services under the UDRP.

7.124 A number of issues were identified in WIPO's report that were considered outside the scope of the First WIPO Process and in need of further study. The Second WIPO Process, which began in July 2000, was initiated to address the issues that might arise in the event of the bad faith, abusive, misleading or unfair use of:

- personal names;
- International Nonproprietary Names (INNs) for pharmaceutical substances;
- names of international intergovernmental organizations (IGOs), such as the United Nations;
- geographical identifiers, including geographical indications, indications of source and geographical terms including country names;
- trade names.

7.125 The Second WIPO Process was conducted on the same basis as the first, and resulted in the publication of a report in September 2001 (entitled "The Recognition of Rights and the Use of Names in the Domain Name System"), which was submitted to the Member States of WIPO and the Board of ICANN. The Report was subjected to comprehensive analysis by the WIPO Standing Committee on the Law of Trademarks, Industrial Designs and Geographical Indications (SCT), which formulated recommendations on which the WIPO Member States took a decision in September 2002. The recommendations decided upon by the Member States are as follows:

- personal names: it was decided that no action should be taken in this area;
- International Nonproprietary Names for pharmaceutical substances (INNs): it was decided that no particular form of protection should be implemented in the DNS at this stage, but that WIPO together with WHO would continue to monitor the situation and that, where necessary, it would bring any important developments to the notice of Member States;
- names of international intergovernmental organizations (IGOs): it was decided that the Uniform Domain Name Dispute Resolution Policy should be amended to allow complaints to be filed by IGOs under certain circumstances, while taking into account the privileges and immunities of such organizations under international law. This recommendation was transmitted to ICANN, the body responsible for amending the UDRP, in February 2003;
- geographical indications, indications of source or geographical terms: it was decided that the question of protection of geographical indications in the DNS should be entrusted to the SCT. With respect to the protection of country names in particular, Member States recommended that the UDRP should be amended to provide protection against the future registration of such names as domain names, where such registration would be liable to create confusion. This recommendation was also transmitted to ICANN in February 2003; and
- trade names: it was decided that the question of protection of trade names in the DNS should be kept under review and raised for further discussion as the situation demanded.

WIPO's Global Network

7.126 Recognizing the vital importance of information technology to a worldwide strategy for intellectual property promotion and protection, WIPO launched in 1998 a major project, called WIPONET, with the aim of providing the necessary infrastructure and services for improved information exchange in the global intellectual property community. The network links the business processes of interdependent intellectual property offices worldwide and users of the Internet. The project promotes the:

- digital development and exchange of intellectual property information;
- establishment of new services;
- streamlining and automation of the business functions of intellectual property offices;
- progressive development and application of global standards and guidelines in intellectual property matters.

7.127 WIPONET already brings information benefits to all countries, but especially to developing countries, where it helps their integration into the international digital environment. To further achieve this aim, WIPO is progressively assisting the intellectual property offices of developing and certain other countries with Internet connectivity and basic equipment.

Standing Committees and Advisory Bodies

7.128 The complementary approach is increasingly pursued through Standing Committees and Advisory Bodies. WIPO has constituted three Standing Committees on legal matters. These are, respectively, the Standing Committees on the Law of Patents, on Copyright and Related Rights and on the Law of Trademarks, Industrial Designs and Geographical Indications. The deliberations of the Standing Committee on the Law of Patents (SCP) led to the convening of a Diplomatic Conference in May 2000 which adopted the Patent Law Treaty (see chapter 5), whilst those of the Standing Committee on Copyright and Related Rights led to the convening of a Diplomatic Conference on the Protection of Audiovisual Performances in December 2000 (see chapter 5).

7.129 After the successful adoption of the Patent Law Treaty, the members of the SCP decided to proceed with further substantive harmonization and agreed to focus discussions on a number of basic legal principles that determine whether a given invention qualifies for patent protection; these, it will be recalled, are the definitions of prior art, novelty, inventive step (non-obviousness) and industrial applicability (utility), sufficiency of disclosure, and the structure and interpretation of claims. Discussions on a draft Substantive Patent Law Treaty and Regulations and Practice Guidelines under it began in November 2000.

7.130 The Standing Committee on the Law of Trademarks, Industrial Designs and Geographical Indications drafted a set of measures to simplify and harmonize procedures relating first to well-known marks, which were adopted as a Joint Recommendation by the WIPO General Assembly and the Assembly of the Paris Union in 1999, then to trademark licenses, which were adopted in 2000, and finally to the Protection of Marks, and Other Industrial Property Rights in Signs, on the Internet, which were adopted in 2001 (see chapter 5). This Standing Committee has initiated work with a view to revising the Trademark Law Treaty (TLT). In order to keep pace with technological

developments and the harmonization and simplification of certain administrative procedures adopted within the framework of the Patent Law Treaty, the revision of the TLT involves provisions on electronic filing of trademark applications and associated communications. The revised TLT will also contain provisions on signature, which accommodate recent developments, such as the increasing acceptance by Offices of electronic signatures or other types of identification.

7.131 An Advisory Committee on Enforcement of Industrial Property Rights was established in 2000, whose work is described in chapter 4.

7.132 The Standing Committee on Information Technologies (SCIT), which was created by WIPO Member States in 1998, serves as a forum to give policy guidance and technical advice on the overall information technology strategy of WIPO, including WIPO standards and the documentation aspects of intellectual property. Following the adoption of a new structure at its meeting in January 2001, the SCIT now has two subsidiary working groups, for Information Technology Projects and Standards and Documentation respectively. Its membership comprises all WIPO Member States and observers.

7.133 The SCIT area of the WIPO Website, besides containing links to all meeting documentation, also currently provides access to information relating to annual technical reports, industrial property statistics, the Journal of Patent Associated Literature, WIPO standards and other documentation.

A Bibliography follows
