



INTELLECTUAL PROPERTY

A POWER TOOL
FOR ECONOMIC
GROWTH

Kamil Idris



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PREFACE

Intellectual property – or IP – is a term increasingly in use today, but still little understood. To many people it remains a mystery – some obscure legal concept of little relevance to every-day life. Using carefully chosen cases and facts and figures this book seeks to demystify IP, setting out to explain the “why” and the “how” of the subject, unlike many previous books that concentrate on the “what”.

This publication is not a legal treatise, it is a practical guide to IP as a tool for economic growth and wealth creation aimed at interested non-specialists, including policy-makers in both the government and business sectors.

Readers will discover that IP is often one of the most important assets of large corporations, that it generates more than 100 billion dollars a year in revenues from patent licensing alone, and that a good patent portfolio can dramatically increase the valuation of an enterprise. They will also realize that disparities in IP assets are as great between the developed and developing world as are disparities in other forms of wealth.

Lack of awareness about IP is understandable because, in the past, it was an esoteric field of law, the preserve of technical specialists and corporate lawyers. However, times have changed: the information technology revolution, and the increasing pace, impact, and importance of invention and innovation, linked to rapid globalization, have brought IP onto center stage. From being a backwater issue, it is now a key factor in government policy-making and in corporate strategic planning.

This publication is written from a definite perspective – that IP is good. It is based on the belief that IP is a “power tool” for economic development that is not yet being used to optimal effect in all countries, particularly in the developing world. It offers the possibility of growth and economic development in a way that is not a “zero sum game”, where if some win, others will lose. On the contrary, international acceptance and utilization of IP tools means that there will be more innovation and therefore more creative change and cultural and economic growth.

The mission of the World Intellectual Property Organization (WIPO) is to promote the protection of IP rights worldwide, and to help extend the reach of the benefits of the international IP system to all its Member States. These goals are complementary, for without IP protection and enforcement, the IP system will not work; and without broad appreciation of the system, and participation in its benefits, it will not be accepted and supported. I am privileged to work with the excellent staff of WIPO towards achieving these twin goals.

I wish to thank the colleagues who contributed to this book, as well as the many professionals who assisted by reviewing drafts and contributing ideas, along with helpful criticism. I hope the following chapters will generate a better understanding of the enormous potential of the international IP system and its role in creating a better future for us all.



KAMIL IDRIS

Director General

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CHAPTER 1

INTELLECTUAL PROPERTY: BASIC PREMISES AND HISTORICAL CONTEXT

“Imagination is more important than knowledge”

Albert Einstein, Scientist (1879-1955)

Albert Einstein’s preference for imagination over knowledge is a starting point for this book because intellectual property is based on the power of imagination. Although not belittling knowledge, Einstein understood that it is the ability to stand on an existing foundation of accepted knowledge, and yet see beyond to the next frontier of discovery that is the source of personal, cultural and economic advancement. Had Einstein been content to simply learn the rules of physics as they were passed down to him as knowledge, he might have been a more successful student, but he might never have developed the theory of relativity, which became the foundation for modern physics as it exists and continues to evolve today.

The history of the human race is a history of the application of imagination, or innovation and creativity, to an existing base of knowledge in order to solve problems. From early writing in Mesopotamia, the Chinese abacus, the Syrian astrolabe, the ancient observatories of India, the Gutenberg printing press, the internal combustion engine, penicillin, plant medicines and cures in Southern Africa, the transistor, semiconductor nanotechnology, recombinant DNA drugs, and countless other discoveries and innovations, it has been the imagination of the world’s creators that has enabled humanity to advance to today’s levels of technological progress.

Imagination feeds progress in the arts as well as science. Music, painting, sculpture, architecture, novels and other works of art, are created by individuals who are not content with the old, and instead see and express ideas and emotions in new ways.

Intellectual property (IP) is the term that describes the ideas, inventions, technologies, artworks, music and literature, that are intangible when first created, but become valuable in tangible form as products. The end of this Chapter provides short definitions and an explanation of the classic forms of IP – patents, copyright, trademarks, and other evolving forms. However, for purposes of this introduction, suffice it to say that IP is the commercial application of imaginative thought to

solving a technical or artistic challenge. It is not the product itself, but the special idea behind it, the way the idea is expressed, and the distinctive way it is named and described.

The word “property” is used to describe this value, because the term applies only to inventions, works and names for which a person or group of persons claims ownership. Ownership is important because experience has shown that potential economic gain provides a powerful incentive to innovate.

It is also important to note that IP results from innovation based on existing knowledge. It is the result of creative improvements on what has worked well in the past, or of creative new expressions of old ideas and concepts.

The term “intellectual property” has recently become topical and, at times, controversial. It is easy to find articles describing recent events related to IP. Some critics attack it as a negative force or as irrelevant to developing countries; some others in developing countries maintain that it stymies creativity. These beliefs have become popular myths and have acquired a cultural momentum. This book addresses why these myths are false and why IP is particularly important today to both developing and developed nations.

We must acknowledge at the outset that, for most people, IP is either an unknown, misunderstood, or mysterious term. Technology and creative arts pervade modern society, yet few actually realize that their daily lives are surrounded by IP creations¹ from which legal rights of all sorts, including their own, arise. Building public awareness of the role of IP is key to fostering a broad understanding of, and respect for, it and the system that promotes and protects it. To truly convince the public, including civil society activist groups, it is essential to engage them in such a way that they all see themselves as stakeholders in a healthy and robust IP system. To do so, they must be included in an ongoing dialogue and feel empowered by the system.

The World Intellectual Property Organization (WIPO) has proclaimed the universal value of IP,² and has shown that IP is native to all peoples,

relevant in all times and cultures, and that it has marked the world's evolution and historically contributed to the progress of societies. Intellectual property is the heritage of us all.

The great African-American chemist and inventor, George Washington Carver, is famous for teaching that invention is available to all peoples, regardless of their economic condition, race, or nationality. Carver invented, and obtained patents³ on crop-rotation methods for conserving nutrients in soil and discovered hundreds of new uses for crops such as the peanut, which created new markets for farmers in the United States of America. His relevance today is greater than ever, as we grapple with the increasing technological divide between rich and poor countries.

“It is not the style of clothes one wears, neither the kind of automobile one drives, nor the amount of money one has in the bank, that counts. These mean nothing. It is simply service that measures success.”⁴

His message was that the power of imagination applied to solving practical problems, is not the exclusive province of any nation or people, but is an empowering force that can advance individuals and nations. Intellectual property is relevant to agriculture as well as to analog signals, to medicinal roots as well as to microbiology, to folk music as well as to file transfer protocols.

This book is about the economically empowering force of IP. It is an exploration of the concepts behind the different forms of IP, and how they operate in real life, rather than a technical legal treatise. It is practical in approach, and the successes of IP empowerment are illustrated throughout the book in boxed articles showing real life stories of businesses throughout the world and how they have used IP. For readers who are not familiar with intellectual property, some history is useful to put it in perspective.

THE HISTORY OF INVENTIONS AND INTELLECTUAL PROPERTY

Few will disagree that today's science, technology, and creative arts shape our day-to-day lives. Early technological breakthroughs catapulted the human race out of feudal systems of society (see Table - 1.1). In the last 100 years or so, technological leadership has become a determining factor in wealth creation and has fueled the growth of nations.⁵

TABLE-1.1 MAJOR INVENTIONS THAT HAVE CHANGED THE COURSE OF HUMANITY

Name	Country	Invention	Description
Johannes Gutenberg	Germany	Printing press	Around 1440, Gutenberg developed the first movable type. Metal pieces made separately for each letter could be used over and over to print copies of various books.
Conrad Gesner	Switzerland	Pencil	Around 1560, Gesner came up with the idea of enclosing a piece of graphite (from the Greek word graphein, meaning to write) with wood as a writing tool.
Maharaja Jai Singh	India	Astronomical Instruments	In 1728, Jai Singh, a scholar (he read the works of Ptolemy, Euclid and Persian astronomers as well as Arab mathematicians), built five astronomical observatories in Delhi, Jaipur, Varanasi, Ujjain and Mathura. The instruments at these observatories, which are still functional, measure precisely time and the position of the sun and stars.
Samuel Morse	United States of America	Telegraph & Morse Code	Morse developed the telegraph as well as an electronic alphabet. In 1840, he submitted a patent application for his invention.
Alfred Nobel	Sweden	Dynamite	In 1863, Nobel developed his first important invention, dynamite, which enabled the detonation of nitroglycerin using a strong shock.

Name	Country	Invention	Description
Alexander G. Bell	United Kingdom	Telephone	In 1876, Bell received a patent for his "method and apparatus which transmits vocal or other sounds telegraphically by causing electrical undulations." Bell's inventiveness was rewarded with 18 patents granted in his name and another 12, which he shared with his collaborators.
Guglielmo Marconi	Italy	Radio	The invention consisted of a device which enabled electromagnetic waves to travel through the air while preserving their features. In 1886, Marconi applied for a patent for his invention.
Orville and Wilbur Wright	United States of America	Airplane	In 1903, the Wright brothers invented their first flying machine in Kitty Hawk, North Carolina.
Vladimir K. Zworykin	Russian Federation	Electronic Television	In 1929, Zworykin invented the cathode-ray tube needed for television transmission.
Ladislao Biro	Argentine/ Hungary	Ballpoint Pen	In 1938, Biro received a patent for a pen with a tiny ball bearing at its tip. As the pen moved along the paper, the ball rotated, picked up the ink from the cartridge and left it on the paper.
Konrad Zuse	Germany	Freely Programmable Computer	Zuse is considered the inventor of a modern (electromechanical binary) computer for his Z1 model completed in 1941
Gertrude Elion	United States of America	Immune System Drugs to Fight Cancer and AIDs	Gertrude Elion, the daughter of Lithuanian and Polish immigrants, was a chemist who studied the human immune system and, in her work at Glaxo-Wellcome in 1956, developed "target specific" drugs to block the replication of cancerous cells. In 1998, she received the Nobel Prize for Chemistry.

Name	Country	Invention	Description
James Russell	United States of America	Compact Disc	In 1965, Russell developed a system that recorded, stored, and replayed music using light (and laser technology) rather than touch. Russell received 22 patents for his system.

From the earliest rituals, through the beginning of music and dance, burial rites, cave paintings, the written word, and theatrical representation, to the use of modern technologies such as the phonogram, celluloid film, wireless broadcast, software, and digital recording, humankind has identified and defined itself through cultural creativity and expressions in the form of artistic creations and performances. Much of this creativity survives and thrives today in folklore or other forms of traditional knowledge. Today's music, films, books, art, and other forms of creations or expressions are indicators of social progress and the quality of life. As the private property of their original creators, they are prized by society for many reasons (including their economic, political and cultural role) but their particular value is that the legacies of human endeavor live in their expression.

Intellectual property is an old concept. The Venetian Law of 1474 is often referred to as the first systematic approach to protecting inventions by a form of patent, as it stipulated an exclusive right of an individual which limited the public interest for the first time. Sixteenth-century Tudor England already had a patent system, and the Statute of Monopolies in 1624 was the first written law which provided for the grant of a monopoly for an invention for a limited period of time.

The second half of the 18th century was a golden age of trade and industry for many countries, as well as a time of artistic creativity, scientific innovation, and political revolution. It was during this Age of Enlightenment that some countries established their first patent systems. For example, the first patent law in France, which provided for the protection of inventors' rights, was enacted in 1791, after the French Revolution and the Declaration of the Rights of Man and of the Citizen. In the United States

of America, in 1788, the Constitution specifically provided for patents and the protection of inventions by granting exclusive rights to inventors.

In the case of copyright, it was the spread of the printing press that provoked the need for a copyright law. Book production in the first millennium was a tedious, slow affair. Scribes wrote and copied books by hand, some with more artistic skill than others. Written works were for the elite only. Organized religion was a prime moving force in the preservation of knowledge in books, as well as the proliferation of multiple copies of books. The invention of movable type and the printing press by Johannes Gutenberg around 1440, was one of the historical events that contributed to the birth of the first copyright system in the world.⁶ As in the protection of inventions, it was also Venice that granted John of Speyer, the first printer, the exclusive right to “print the letters” in 1469.⁷

With Gutenberg’s invention available everywhere in western Europe by the second half of the 15th century, the Roman Catholic Church began to ban books written by reformers, and monopolies of the press emerged in England and France. In the 16th century, monopolies by printers continued in order to protect publishers’ profits and to permit control over printing. In 1710, the Statute of Anne was enacted by the British Parliament, diminishing some of the control of publishers over printing and also recognizing authors’ rights, giving them or their heirs exclusive powers to reprint a book for 14 years after it was first published.⁸ Called an “act for the encouragement of learning”, the Statute of Anne was one of the inspirations for the intellectual property protection in the United States Constitution.⁹

Even at this early stage, the development of patent and copyright laws reflected the fluctuations of the economy. Following the eclipse of Venice after 1600, there was a shift of economic progress from southern to northwestern Europe. Before 1800, though examples of industrial concentration can be identified in several European countries, manufacturing growth was still largely a matter of multiplication of small-scale artisan production rather than of radical new methods and organizations. However, between 1750 and 1870, Europe experienced major change stemming from, among other things, growing cities, railway building, the investment of capital, the growing transoceanic economy.¹⁰ Towards the

end of the 19th century, these factors led to large-scale industrialization, supported by new ideals of industrialism, the emergence of stronger centralized governments, and stronger nationalism. These developments led many countries to establish their first modern patent and copyright laws.¹¹

However, the development of the modern concept of IP laws was not always straightforward. In the 19th century, free trade movements that called for abolishing the patent system received wide support.¹² But the strong wave of nationalism that characterized the period appears to have played an important role in supporting the introduction and maintenance of modern industrial property laws.

THE FIRST INTERNATIONAL IP TREATIES: PARIS AND BERNE

In the second half of the 19th century, goods and workers crossing national borders brought a wave of globalization to industrial powers. Although patent laws had been enacted in several countries, the demand for international protection of inventions began to be felt. In fact, foreign exhibitors refused to attend the International Exhibition of Inventions in Vienna in 1873 because they were afraid their ideas would be stolen and exploited commercially in other countries. This incident resulted in the birth of the Paris Convention for the Protection of Industrial Property in 1883, the first major international treaty designed to help the people of one country obtain protection in other countries for their intellectual creations. Such protection took the form of industrial property rights, in the form of patents (invention), marks, and industrial designs.

In the mid-1800s, renowned authors were finding their works illegally reproduced and for sale in countries other than their own, and from which they received no royalties. In order to eliminate this practice, the famed French author of *Les Misérables* and *The Hunchback of Notre Dame*, Victor Hugo, organized a group of prominent authors into the International Literary Association, which later became known as the International Literary and Artistic Association, with the intention of establishing some basic form of international protection for their works.

In 1886, to provide the basis for mutual recognition of copyright between different states, another major international IP treaty was enacted, the Berne Convention for the Protection of Literary and Artistic Works.

The crux of both conventions was the principle of national treatment, that is, equal protection between nationals and foreigners. This principle is best defined, in the original text of the Paris Convention, by the provision on national treatment in Article 2:

“The subjects or citizens of each of the contracting States shall, as regards patents, industrial designs, trade marks and trade names, enjoy the advantages that their respective laws now grant, or may hereafter grant, to nationals. Consequently, they shall have the same protection as the latter and the same legal remedy against any infringement of their rights, provided they observe the formalities and conditions imposed upon nationals by the domestic legislation of each State.”

In the first one hundred years since the establishment of the Paris Convention and the Berne Convention, we have seen growth in the protection of inventions, marks, and other objects of industrial property and of copyrighted works at the international level. In these first hundred years, we have also seen the early development of cooperation among states in the field of intellectual property.¹³ The continued support for, and development of, the IP system over the last century attests to the fact that many states recognize the role of IP in promoting and stimulating innovation and technological and artistic achievement.

Indeed, as the former Director General of WIPO, Arpad Bogsch, stated:

“The search for new technological solutions and cultural creative activities deserves constant encouragement because, as the history of nations has shown, in addition to spiritual development, inventions and cultural creations are the main sources of social and economic development of mankind. Food, health, communications and other fundamental needs for the survival of the human race have improved, are improving and will continue to improve because of inventions and creations.”¹⁴

The history of IP is a much longer topic than can be covered in this chapter. What is important to note here, however, is that the premise underlying IP has always been the recognition that ownership of inventions and creative works stimulates their creation and, with such creation, also stimulates economic development. The continuum from problem → to knowledge → to imagination → to innovation → to intellectual property and finally → to the solution in the form of products, continues to be a powerful driving force for economic development. As we will explore in this book, in today's world the connection between IP and economic development is more relevant than ever before, as IP comes to the fore in international debate.

TYPES OF INTELLECTUAL PROPERTY

Since the birth of the two pillars of IP, i.e. industrial property and copyright, other forms have been developed and established either as subsets of the previously existing types of IP or as new breeds.

The convention establishing WIPO of 1967¹⁵ stipulates that IP shall include rights relating to the following:

1. Literary, artistic and scientific works
2. Performances of performing artists, phonograms, and broadcasts
3. Inventions in all fields of human endeavor
4. Scientific discoveries
5. Industrial designs
6. Marks and commercial names and designations
7. Protection against unfair competition
8. All other rights resulting from intellectual activity in the industrial, scientific, literary, and artistic fields.

Several international treaties concluded since 1967, notably the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) of the World Trade Organization (WTO), further clarified and elaborated new types of intellectual property, for example, the design of integrated circuits, based on earlier work undertaken by WIPO. This trend shows the dynamic nature of IP in response to technological and cultural developments concerning, for example, computer hardware and software, digital communications, the Internet, and genomics.

The areas mentioned under (1) belong to the “copyright” branch and under (2) to the “related rights” branch of intellectual property. The areas under (3), (4), (5), (6), and (7) constitute the industrial property branch of IP.

The most common forms of intellectual property are briefly defined below.¹⁶

Patent (Invention)

A patent is an exclusive right granted for an invention (a product or a process that provides a new way of doing something, or offers a new technical solution to a problem). It provides protection for the invention for a limited period, generally 20 years from the filing date, in the country or countries in which it is patented, in exchange for the inventor’s public disclosure of the invention. A patent owner has the right to decide who may – or may not – use the patented invention, and may give permission to, or license, other parties to use the invention on mutually agreed terms. The owner may also sell the right to the invention to someone else, who will then become the new owner of the patent.¹⁷ Once a patent expires, the protection ends, and the invention may be used by anyone.¹⁸

Trademark

A trademark or “mark” is a distinctive name, logo or sign¹⁹ identifying the source of goods or services. Trademarks help consumers distinguish a product or service from one source from those produced by another source. A mark provides protection to its owner by preventing confusion as to source in connection with the distribution of goods or services or licensing others to use them. The period of protection varies, but a mark can remain valid indefinitely through continued commercial use or a registration and renewal process.

Patents and trademarks are often referred to collectively as “industrial property”.

Copyright and Related Rights

Copyright consists of a bundle of rights given to creators in their literary and artistic works. These creators, and their heirs, hold the exclusive rights to use or license others to use the work on agreed terms. The creator of a work can prohibit or authorize,²⁰ for example:

- its reproduction in various forms, such as a printed publication or a phonorecord;
- its public performance, as in a play or musical work;
- its broadcasting, including by radio, television, or satellite;
- its translation into other languages, or its adaptation, such as the adaptation of a novel into a screenplay.

Copyright applies to many different types of artistic works, including paintings, music, poems, plays, books, architecture and choreography, as well as to works that are generally not considered artistic such as computer software, maps and technical drawings.

Related rights are rights that have evolved in the last 50 years or so “around” copyright, and include the right of a performer in his/her performance, the right of a producer of a sound recording in the recording, and the right of a broadcaster in a broadcast.

Many creative works protected by copyright generally require mass distribution, communication, and financial investment for their dissemination (for example, publications, sound recordings, and films). Hence, creators often sell the rights to their works to individuals or companies that can package, market, and distribute the works in return for payment (lump sum or royalties). These economic rights have a time limit, according to the relevant WIPO treaty, of the life of the author plus 50 years after the author’s death. In some countries, that term has been extended to 70 years. Copyright may also include moral rights, which involve the right to claim authorship of a work, and the right to oppose changes to it that could harm the creator’s reputation.

- 1 Patents and expired patents, for example, surround our daily life and concern products such as electric lighting (patents held by Edison and Swan), plastics (patents held by Baekeland), ballpoint pens (patents held by Biro), and micro-processors (patents held by Intel).
- 2 WIPO, *World Intellectual Property Declaration (WO/GA/26/4 Annex IV)* presented to the Assemblies of Member States of WIPO (September 2000). See, http://www.wipo.int/about-wipo/en/pac/ip_declaration.htm
- 3 www.invent.org/index.asp; patent Nos. 1,522, 176; 1,541, 478.
- 4 www.ideafinder.com/history/inventors/carver.htm
- 5 See, for example, the growth models in Robert Solow, "Technical Change and the Aggregate Production Functions," *Review of Economics and Statistics* 39 (1957): 12-13 and Paul Romer, "Endogenous Technological Change," *Journal of Political Economy* 98 (1990): 5, pt. 2, S74-S75. See Chapter 2 for greater detail.
- 6 Gutenberg is credited with printing the oldest surviving printed book in the western world, the Gutenberg Bible, which has 42 lines per page and is sometimes known as the 42-line Bible or Mazarin Bible. He also fashioned a font of over 300 characters, as well as a variable width mold to accept his blend of lead, antimony and tin which was used in type foundries into the last century.
- 7 To **print the letters** means to produce multiple copies of a document by using the printing press method. John of Speyer designed the first type of roman character on which he received a patent, which expired at his death in 1470.
- 8 See, for example <http://artnetweb.com/iola/journal/history/1994/copyright.html#fn3>, <http://hutzley1.tripod.com/copyright/history.htm>, <http://www.platopress.co.uk/copyright/intro/history02.htm>, and <http://arl.cni.org/info/frn/copy/timeline.html>
- 9 <http://english.ttu.edu/kairos/3.1/coverweb/ty/anne.html>
- 10 J. M. Roberts, *A History of Europe* (Oxford: Helicon Publishing, 1996): 214, 217, 326.
- 11 For example, in Germany, the first federal patent law was enacted in 1877. France modernized its 1791 law in 1844. Many other countries introduced modern patent laws in the 19th century: Italy (1859), Argentina (1864), Spain (1878), Brazil (1882), Sweden (1884), Canada (1886), India and Japan (1888), Mexico (1890), Germany (1891), and Portugal and South Africa (1896).

- 12 *Consequent to the free trade movement, the Netherlands abolished its patent law in 1869, although subsequently a new one was re-introduced in 1910.*
- 13 *The International Bureaus created to carry out administrative tasks for the implementation of the two conventions were the predecessors of the World Intellectual Property Organization (WIPO).*
- 14 *Arpad Bogoch, then Director General of WIPO, **The Paris Convention for the Protection of Industrial Property from 1883 to 1983**, (Geneva, WIPO1983): Preface.*
- 15 *The Convention Establishing the World Intellectual Property Organization (signed at Stockholm, July 14, 1967 and amended on September 28, 1979). See, <http://www.wipo.int/clea/docs/en/wo/wo029en.htm>*
- 16 *Condensed from the WIPO website (<http://www.wipo.int>).*
- 17 *Patent rights are usually enforced in a court which, in most systems, holds the authority to stop patent infringement. Conversely, a court can also declare a patent invalid upon a successful challenge by the defendant or a third party.*
- 18 *Once the patent of the invention expires (even before the expiry of the patent term, the patent expires if its inventor or patent holder stops paying the patent maintenance fees) the patent holder can no longer exercise control over the use made of the invention; that is, the exclusive rights of the owner to the invention cease and the invention becomes available for commercial exploitation by others.*
- 19 *Its origin dates back to ancient times, when craftsmen reproduced their signatures, or marks, on their artistic or utilitarian products. Over the years the practice of using these marks evolved into today's system of trademark registration and protection.*
- 20 *The creator – or the owner of the copyright in a work – can enforce rights in the courts where the owner may obtain an order to stop unauthorized use (often called piracy), as well as obtain damages for loss of financial rewards and recognition.*

CHAPTER 2

THE PROCESS OF ECONOMIC GROWTH

For many years, economists have tried to provide an explanation as to why some economies grow fast while others perform badly; in other words, why some countries are rich and others are not. Different theories and models of economic growth have been suggested. It may be that, taken together, economic history and new growth theory provide a more complete picture of technological change than either one can give on its own.¹

It is generally agreed that technology and knowledge have played an important role in recent economic growth.² This chapter will address the relation between economic growth and knowledge (or in the broadest sense, technology) by introducing several economic growth theories that have been proposed and discussed over the last 50 years. It will then examine the role of intellectual property (in particular, patents) in facilitating the creation of knowledge, paying particular attention to the recent technology revolution and to the increasing degree of sophistication in both “hard” and “soft” industries.

Intellectual property could be called the Cinderella of the new economy. A drab but useful servant, consigned to the dusty and uneventful offices of corporate legal departments until the princes of globalization and technological innovation – revealing her true value – swept her to prominence and gave her an enticing new allure. Not so long ago, protecting and managing intellectual property was a fairly quiet field of endeavor not given to making headlines or causing ripples on the stock market. However, in the space of a few years, IP issues have come to feature regularly as major news items and have taken their place as a key element in corporate strategy, affecting company ratings.

CLASSICAL THEORIES

In the days of classical economists such as Adam Smith, Ricardo, and Marx, capital played an important role in theories of growth. Although writing from different perspectives, classical economists believed that capital and technological progress contributed to the way an economy grew. Smith, for example, believed that improved technology would lead to increased labor productivity. He saw division of labor as the accelerator

of invention, and hence, technological progress. Despite the belief that technological progress contributed to increased productivity, classical economists, in particular Ricardo and Malthus, thought that in the long term, increased populations would outpace the productivity of labor, which would lead to what is known as the *law of diminishing returns*.³ Based on the law of diminishing returns, it was thought that there could not logically be infinite growth, and that growth would diminish at some point. Donella Meadows in *The Limits to Growth*⁴ postulated that limitless growth was not only undesirable, but also unsustainable. Unrestrained growth would exhaust the earth's supply of life-sustaining resources and would in the end annihilate the human race by driving it into extinction. A mood of pessimism prevailed in the face of an exploding world population that was seeking to be sustained by resources that were at best constant, but in reality could well be dwindling.

TWO SCHOOLS OF THOUGHT

It is important to look at how these earlier economists viewed the role of technology in the growth of an economy, because the insights they provided prepared the ground for growth theories that were developed in the last century while focusing on the contribution of technology to economic growth. These theories may be grouped into two models, known as exogenous and endogenous growth theories (see Chart - 2.1); both theories agree that technology is the engine of growth, but differ on how to treat technological progress as a factor in economic growth.⁵

Endogenous growth theory: According to this theory, technological change is included in the new capital stock. From this perspective, technological change is induced by previous economic conditions. In other words, economic growth originates from within the system, usually a nation-state, and technological progress is regarded as an endogenous factor. Endogenous growth theory focuses on education, on-the-job training, and development of new technologies for the world market, as major factors which determine the rate of growth of a nation-state.⁶

Exogenous growth theory: According to this theory, technological change contributes to increased output without any change to the input of labor and capital in the production process. In other words, technological progress leads to increased output while using the same amount of labor and capital. However, the theory does not specify any particular transmission mechanism by which technological progress takes place; rather, such progress is disembodied and assumed to fall like “manna from heaven”. This perspective sees technology as an exogenous factor.

CHART-2.1 TWO MODELS OF GROWTH THEORIES



Endogenous: Internal Power

Exogenous: “Manna From Heaven”

The work of Joseph A. Schumpeter, which is discussed below, has laid the necessary groundwork for the endogenous growth theorists. It explains why he saw technological progress as an endogenous process.

INNOVATION FOR CREATIVE DESTRUCTION

Schumpeter developed a growth theory centered on innovation and entrepreneurship. He saw a dynamic economy not as one in equilibrium, but rather, as one that is constantly disrupted by technological innovation.⁷ Entrepreneurs took advantage of a basic invention, be it a new product or a new technique, transforming it into economic innovation. Inventions were economically irrelevant until entrepreneurs got involved, to make them operational and to market them. In his view, entrepreneurs were motivated by the potential to make a profit. These new innovations would then be imitated, and in the process, this would lead to a boom in the economy, though the imitators would curtail the entrepreneurial profits.⁸ Although agreeing that several factors were necessary for economic development, Schumpeter regarded entrepreneurial zeal for profit as the driving force of most innovation.

Schumpeter considered that some degree of monopoly power would be necessary to enable entrepreneurs to continue innovating. However, he later predicted the demise of entrepreneurs and the emergence of a new mode of economic organization in which innovation and R&D would be conducted by large firms.⁹ This conclusion led some economists to see two Schumpeters: Schumpeter I, who saw entrepreneurs playing a leading role in technological progress; and Schumpeter II, who saw scientific and technical activities being undertaken by large firms.¹⁰ According to Schumpeter II, large monopolistic enterprises were the principal engines of technological progress, as they had the necessary resources to undertake complex technological activities and were also threatened by what he termed creative destruction (that is, innovations displacing inferior technologies).

Recently, some economists, in particular William Baumol, have attempted to pick up on Schumpeter's work by trying to introduce the role of the entrepreneur into the growth process. They have postulated that an IP system is to be regarded as an important factor influencing the behavior of the entrepreneur in encouraging innovators, applying the innovation, introducing it into the economy, and marketing the product in a creative or innovative way.¹¹

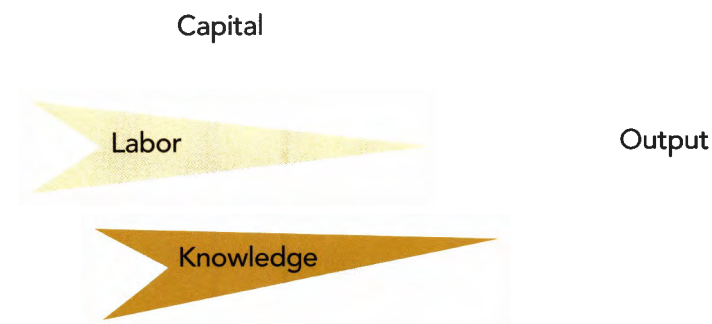
TECHNOLOGICAL PROGRESS – AN IMPORTANT ECONOMIC VARIABLE

In the 1950s, the neoclassical economists, led by Robert Solow, started focusing on technological progress as an important variable in economic growth. Unlike his neoclassical predecessors who treated capital as the main contributing factor in economic growth, Solow, based on his study of gross domestic product (GDP) data for the United States of America from 1909 to 1949, suggested that the growth in capital stock contributed to less than 20 percent of the growth of GDP per person employed, and argued that the growth in labor and capital explained only half of the growth in total GDP. He concluded that the remaining unexplained portion of growth, which came to be known as the *Solow residual*, resulted from technological progress.¹²

Solow introduced technological improvements as an exogenous variable into his growth model and changed the way economists perceived the contribution of technological progress in the economic growth of a nation-state. His findings were later supported in a study by Edward Denison, which concluded that, between 1929 and 1957, 40 percent of the increase in per capita income in the United States of America was due to the "advance of knowledge".¹³ Today, these figures are likely to be much higher. Thanks to constant and rapid innovation, more than half of US economic growth is currently generated by industries that were hardly in existence a decade ago.¹⁴

Basically, the Solow model (see Chart - 2.2) focuses on four variables: output, capital, labor, and knowledge. It analyses how capital, labor and knowledge combine to produce output, the level of which can determine the growth of an economy over a period of time. This model assumes that technological progress occurs when there is an increase in the amount of knowledge, and that the production function constantly returns to scale in relation to capital and effective labor.

CHART-2.2 THE SOLOW MODEL



According to Solow, the growth of an economy depends on the rate of growth of capital, labor, and technological improvement. Solow believed, and tried to prove, that an economy would grow if a large share of its total output was devoted to investment or if there was a rapid growth of technology. Technological progress was the key factor leading to economic growth. Growth had little to do with the state of the internal economy, and progress in science and technology depended little on monetary or fiscal policy (that is, economic policy).¹⁵ In other words, treating technological progress as exogenous meant that the implementation of economic policy did not directly influence technical progress, but technical progress could influence economic policy. That is why the Solow model did not attempt to define where technology was coming from; it just recognized when technological progress had occurred and assumed that it was growing at a constant rate.¹⁶ The inclusion of technological progress in the Solow model meant that a country with a higher rate of technological growth (hence greater productivity growth) would experience a higher standard of living than those countries without such growth.

In explaining the applicability of his model, especially in relation to the rising standard of living as far as output growth and consumption growth were concerned, Solow introduced an assumption of technology growth as being exogenously determined and thus increasing the productivity of labor. This assumption meant that the natural rate of growth was not only composed of the biological rate of population growth, but also included the rate of technological progress; this is known as effective labor. The neoclassical economists are of the view that government policy does not have an effect on the growth of technology.¹⁷ Furthermore, the neoclassical approach emphasizes such issues as competitive behavior, equilibrium dynamics, and the way diminishing returns affect the accumulation of labor cost and capital.¹⁸

NEW ENDOGENOUS GROWTH THEORIES IN THE 1980s

In the 1980s, after several economists¹⁹ made contributions on the importance of technological progress to economic growth, new growth theories, also known as new endogenous growth theories, emerged, formulating technological progress as an endogenous variable, which could be influenced by government policy. These theories suggested that a country's long-term growth rate could be influenced by government policies, among others the protection of intellectual property, taxation, maintenance of law and order, and fiscal and monetary policies.

Paul Romer introduced a model which suggested that the accumulation of knowledge was the driving force behind economic growth.²⁰ Romer's paper reopened the debate on the contribution of technological progress to the economic growth of a nation-state. His model assumes a monopolistic competitive environment and suggests that R&D activities, and the accumulation of human capital through education and training, play important roles in generating long-term growth in per capita income. Like Solow, Romer also focused on labor, capital, technology, and output, and how the first three variables combine over a period of time to produce output. In an attempt to avoid the paradox encountered by the Solow model concerning the failure of less-developed countries to take advantage of existing technological progress, Romer postulated that technological progress in industry requires concerted, profit-oriented activity that yields two distinct components: (a) specific technical features embodied in products that can be patented and produced, excluding rival firms from the same activity; and (b) the knowledge that those features were essentially for the public good.²¹ In order to encourage people or institutions to be involved in knowledge creation, the principle of excludability had to be invoked. He argued that two ways can be used to exclude others: first, keeping the knowledge a secret and second, invoking effective intellectual property laws.

Romer concluded that for countries to promote growth, their economic policies should:

- encourage investment in new research, as opposed to encouraging investment in physical capital accumulation, and
- subsidize the accumulation of total human capital, as the higher the level of human capital a country possesses the higher its productivity, which translates into sustained economic growth.

Grossman and Helpman²² refer to studies made in several industries including machine tools, aircraft, synthetic chemicals, metallurgy, and semiconductors, which showed that the driving force behind investment in new technology was the potential of earning profit. They argue that among the factors which determine the profitability of such investment, and thus affect the pace and direction of technological change, are the institutional, legal, and economic environments. Various models of endogenous growth have been introduced so far and the debate on the relevance of exogenous or endogenous growth theories in explaining the factors determining the growth of countries is far from over.

A GLOBAL AWAKENING TO THE ROLES OF INTELLECTUAL PROPERTY IN THE 1990s

Looking back at the economic development achieved by some economically strong countries in the 1990s, there were, first, policy changes emerging from rapid knowledge creation and the adoption of new knowledge management practices and, second, changes due to the emergence of new technologies.

One of the consequences of the new pattern of global trade that started at the beginning of the 1990s was the forging of a deliberate connection between trade law and IP policies when some advanced countries began to "use trade measures to curb piracy of intellectual property rights abroad."²³ Among other things, this led to the inclusion of the

TRIPS Agreement as one of the agreements in the framework of the multilateral trade negotiations under the Uruguay Round. That Agreement established global standards for IP protection that would be binding on both developed and developing countries, including enforcement and border measures.

The rapid development of new technologies has led to adaptation to, and in some cases criticism of, prevailing IP regimes. This comprehensive technological revolution touched many areas, among others, information and communication technologies, biomedical research and development of new drugs, digital technology, high-performance materials, artificial intelligence, and virtual marketing in cyberspace. The adaptation of IP protection to biotechnology and the protection of intellectual property in cyberspace, in particular, posed many profound challenges.

In the special case of biotechnology, the advent of new tools for research in genetic engineering has had a strong impact on agricultural and biotechnological research programs. In agriculture, the relevance of IP has traditionally been limited, as most R&D has been conducted by public sector institutions. Biotechnology, however, is increasingly private-sector driven and increasingly relies on IP. An additional level of complexity is introduced through the use of many biological or genetic research materials from the gene-rich developing world.²⁴

The combined application of computer and telecommunications technologies, as reflected by the Internet, poses another set of problems for IP regimes. With a few keystrokes one can anonymously download copyrighted material from numerous websites around the world.²⁵ Moreover, the scope and extent of liabilities between providers of information on the Internet and content right holders need to be better understood.

These developments are only a sampling of how the IP system is being integrated into the knowledge economy, and how it poses interesting challenges to industry, government policy-makers, scholars, and researchers in both developed and developing countries.

STATISTICS SUGGESTING THE RELATION BETWEEN ECONOMIC GROWTH, R&D AND IP

Some statistics support the relation between economic growth, R&D and IP. As discussed above, economists have explained the process of economic growth as being driven by two main sources: the supply of factors of production, namely physical capital and labor (or human capital), and technology. Many studies have shown that the influences underlying economic performance are affected by the interaction between the two sources of growth, and the relative proportions of labor and physical capital and technology.²⁶

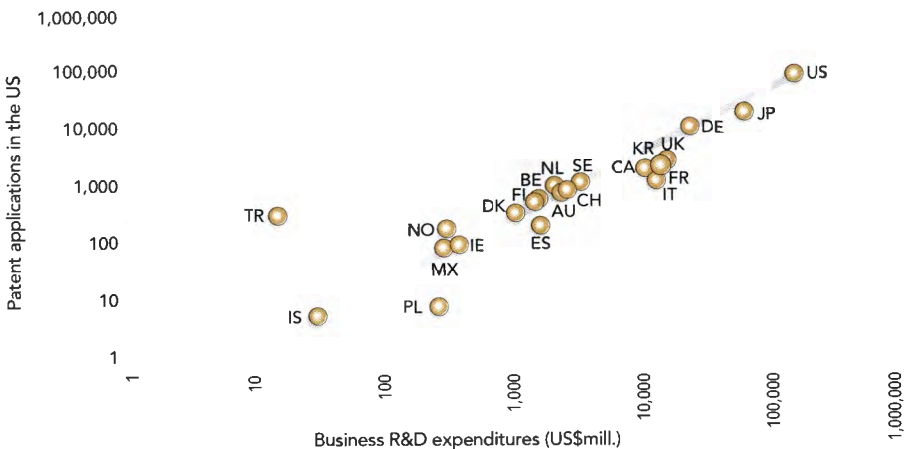
It has been postulated that IP significantly influences the appreciation in value and the accumulation in quantity of human capital, and the rate and direction of technological change.²⁷ Recent literature also describes the emerging attitudes toward IP protection in both developed and developing countries – for example, how the growth in patent filings is concomitant with the growth of knowledge activities (see for instance Table - 2.3),²⁸ and even how patent-related statistics can act as an indicator of the strength or weakness of the economy.

TABLE-2.3 GROWTH OF US UTILITY PATENTS BY SECTOR, 1982-1996²⁹

Sector	Approximate Number of Utility Patents per Year		Percentage Growth
	1982	1996	
Advanced Materials	250	1,200	333 %
Information Technology	4,000	16,000	305 %
Health	2,000	4,700	189 %
Automotive	1,300	2,700	105 %
All US Patents	58,000	110,000	89 %

In the 1990s, an increasing number of policy-makers in countries with emerging economies recognized the role of the IP system as an important element of the institutional infrastructure for encouraging private investment in R&D, especially in the industrial and scientific fields. This is supported by the pattern of business R&D investment in the Organisation for Economic Cooperation and Development (OECD) countries, for example, which suggests that a strong correlation exists between the level of R&D expenditure and the level of patenting activity (see Chart - 2.4).

CHART-2.4 LINK BETWEEN BUSINESS R&D EXPENDITURE AND PATENT APPLICATIONS IN THE US (1997)³⁰

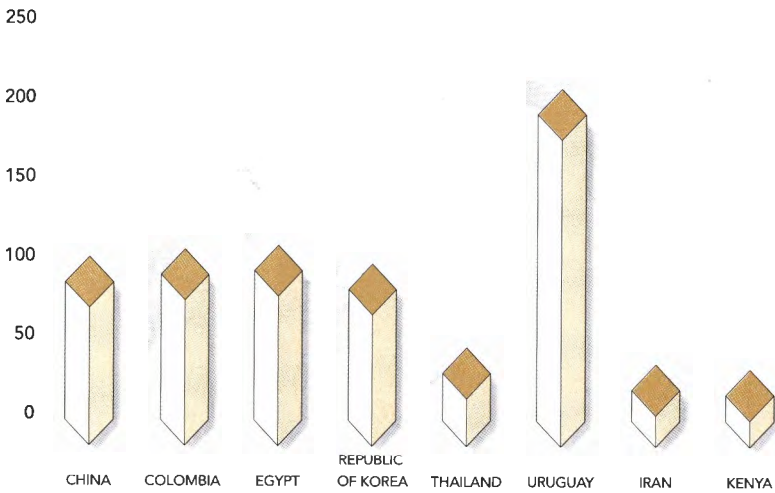


Legend: AU (Australia), BE (Belgium), CA (Canada), CH (Switzerland), DE (Germany), DK (Denmark), ES (Spain), FI (Finland), IE (Ireland), IS (Iceland), IT (Italy), JP (Japan), KR (Republic of Korea), MX (Mexico), NL (Netherlands), NO (Norway), PL (Poland), SE (Sweden), TR (Turkey), UK (United Kingdom), US (United States of America)

The influence of IP is also reflected in the increasing contribution of knowledge-intensive industries to gross national product (GNP) (for example, in the United States of America, this increased from 21 to 27 percent from 1982 to 1995). In the 1990s, the rapid expansion of a new global trading regime following the establishment of the World Trade Organization (WTO) also triggered much attention to, and increasing demand for, IP protection, especially in the high technology and other knowledge-intensive industry sectors.

The propensity of firms to patent their inventions has similarly increased worldwide. Patent applications and grants have increased even in developing countries where patent filing rates have traditionally been very low (see Chart - 2.5).

CHART-2.5 TOTAL PATENT APPLICATIONS IN SELECTED DEVELOPING COUNTRIES
(PERCENTAGE INCREASE FROM 1994 TO 1998)



The upward trend in patent applications is particularly noticeable in Japan, the United States of America, and Europe. In Japan, it took 95 years to grant the first million patents, whereas it took only 15 years to grant the next million. A very similar trend is noticeable in the filing of international applications under the Patent Cooperation Treaty (PCT) administered by WIPO (see Chart - 2.6). The PCT had a membership of 117 States as of August 2002. WIPO received over 103,000 PCT applications in 2001, a 14.3 percent increase from 2000. For the eleventh consecutive year, inventors and industry from the United States of America (38.5 percent of all applications in 2001), Germany (13.1 percent), Japan (11.4 percent), the United Kingdom (6.0 percent), and France (4.4 percent) topped the list of the biggest users of the system.

CHART-2.6 INCREASE IN PCT APPLICATIONS SINCE 1978



However, use of the PCT in developing countries that have started to accumulate knowledge and gain economic power is increasing (see Table - 2.7). For example, the number of PCT applications filed by developing countries in 2001 rose by 70.6 percent, with the largest number generated by users in China, the Republic of Korea, and South Africa. Compared to the 2000 statistics, the increase was particularly high in China (188 percent), India (103 percent) and the Republic of Korea (53 percent).

TABLE-2.7 NUMBER OF PCT APPLICATIONS FILED BY PCT USERS IN SELECTED DEVELOPING COUNTRIES

Country	2000	2001	Growth
Brazil	161	193	20%
China	579	1670	188%
India	156	316	103%
Mexico	71	107	51%
Republic of Korea	1514	2318	53%
Singapore	225	271	20%
South Africa	386	418	8%

Current data regarding the importance of IP in economic development is still limited, however. Visible and demonstrable evidence of economic payoff attributable to IP protection is currently not sufficiently developed.³¹ It is difficult to analyze the role of IP in the economic development process because of complexities in separating or disaggregating the effects of IP protection from other factors that impact developing economies.³² Some experts argue that the role of IP in economic development is likely to be case-specific, with variations both from industry to industry and among countries.³³ Others, however, contend that the strength or weakness of the IP situation has a strong effect on foreign direct investment (FDI),³⁴ and that a low level of IP protection will preclude certain types of investment in various industries.³⁵

The difficulty in analyzing the economic aspects of intellectual property is attributable to the complex interplay of many factors. The nature and extent of this complexity can be clearly seen by examining the role of the patent system in the performance of the economy.

Typically, a patent system is established for the following reasons: (a) to promote creativity and inventiveness by offering exclusive ownership rights and a reasonable period for recovering R&D costs for the invention, (b) to promote investment to commercialize new inventions through limited exclusive rights in working the invention and marketing it, and (c) to diffuse knowledge and information through publication of patent applications and grants for the benefit of other R&D and society as a whole. These reasons could seem to be more applicable and relevant to the developed economies than to the developing and least developed countries due to a number of factors surrounding local creativity and inventiveness in the latter countries,³⁶ including a different IP paradigm that arises with the emerging demand for protection of "rural inventions" and traditional knowledge. Indeed, in developing countries, the majority of patent applications are filed by foreigners from developed countries,³⁷ and the conditions for promoting local innovation in many fields are far from ideal, due to constraints in resources and other factors (limited access to research material, facilities, and prototyping possibilities, lack of relevant technical and managerial skills, disorganized markets, and so forth).

Critics of the patent system hypothesize that, because of these factors, the economic rewards for innovation will flow from the developing to the developed countries, and that capital investment in developing countries is likely to center on foreign-owned or controlled enterprises. The latter, of course, is expected to result in the payment of royalties to foreign-owned enterprises.³⁸ Taken in isolation, these factors would seem to present a bias against developing economies.

However, the patent system offers practical and positive advantages, especially to developing countries. For instance, it facilitates transfer of technology and patent licensing through an active use of patent information (see more in Chapter 4). Moreover, it can be utilized as a practical guide to investment decision-making by corporations looking for lower factor prices in developing countries for their manufacturing activities.³⁹ In many ways, the patent system functions as an indicator of the level of protection afforded to the introduction or transfer of proprietary technologies to developing countries, and as a rough assessment of the risk of working a particular invention without full patent protection in a particular sector where there is an observed high rate of patenting activity. The quality of the national patent law attests to the seriousness of a government's commitment to encourage both innovation and respect for the IP related to it, and its belief in the positive role played by the patent system in national development.

IP AND INVESTMENT

Economists have not adequately dealt with issues directly related to economics and intellectual property. Among the few who have addressed this subject, there are differing opinions. Some are supportive of the positive relationship between intellectual property and innovations and inventions, and others have different views.⁴⁰ Many researchers have suggested a direct link between enhanced IP protection and an increase in inward FDI in certain countries.⁴¹ A steady and steeply rising increase in FDI in India has been evident (except for a dip in 1999 due to the adverse impact of the east Asian crisis) ever since patent and trademark reform was introduced in the early 1990s. The equivalent increase in Brazil is more dramatic, with a spectacular growth in FDI following the introduction of a

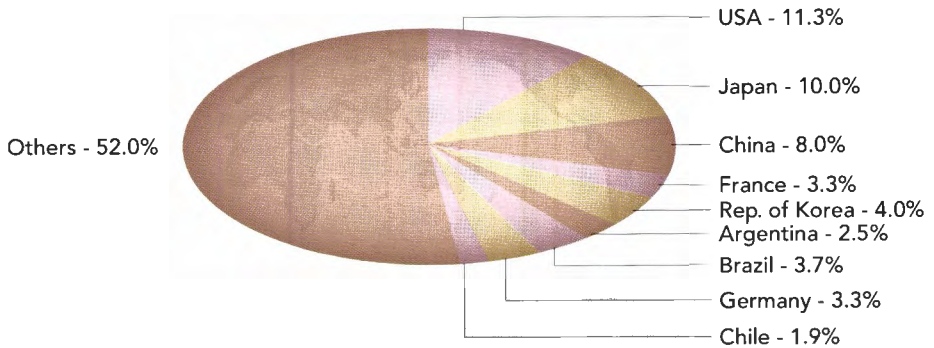
new industrial property law in 1996, which provided patent protection for 20 years, as well as pipeline protection for drugs not yet on the market.

It is common knowledge that investment in R&D is quite an expensive undertaking. Investors will under-invest in such activity if they are not assured of reaping the lion's share of the resulting benefits.⁴² It can be convincingly argued that IP protection plays a catalytic role in stimulating R&D.⁴³ Furthermore, protection of intellectual property has the potential to contribute positively to a country's efforts to attract FDI, increase foreign trade, and provide the necessary conditions for transfer of technology. The combination of all these factors contributes to a greater potential for increased growth. In the case of Japan, for example, the rate of technological development since 1945 can significantly, though not entirely, be associated with intellectual property and, in particular, the patent system, which was widely used in the "catching-up" process.⁴⁴

The relationship between international economic activity and IP for developing countries in the post-TRIPS era was recently examined by W. Lesser of Cornell University, in a paper commissioned by WIPO. He examined in particular the link between stronger IP protection and two international factors: FDI and imports. Lesser reports his findings that "the relationship between the IP score and both FDI and imports is both positive and significant" and concludes that "...taken in the context of previous studies, [the result] is compelling evidence that stronger [intellectual property rights] IPR do indeed provide some domestic benefits for developing nations."⁴⁵

There are many other positive aspects to the question of intellectual property and its benefits in the economic equation, especially if one looks at intellectual property other than patents. Take the case of trademarks, for example. Trademarks are an important component of the IP system and have a strong influence on private investment and marketing decisions. They have been in use for many years in many countries, both developed and developing (see Chart - 2.8). IP executives consider the market value of their trademarks as part of their intellectual and intangible capital (see "The World's Most Valuable Brands" in Chapter 5).

CHART-2.8 SHARE OF INDIVIDUAL COUNTRIES
IN TOTAL TRADEMARKS REGISTERED IN 1996



The value added from the cultural industries (literature, music, art, etc.) should similarly be considered. In developing countries, this economic sector has grown considerably as suggested in Table - 2.9 concerning the book publishing sector. Copyright and related rights of authors, performing artists, producers of sound recordings, broadcasters, and other creators have been in the limelight for some time because of the economic losses attributed to piracy of works protected by copyright, particularly, software, music, and film. Based on OECD data, the proportion of counterfeit goods in total sector sales has reached 33 percent for the music sector, 50 percent for the video sector, and 43 percent for the software sector.

TABLE-2.9 ANNUAL BOOK TITLE PRODUCTION IN SELECTED COUNTRIES

Country	1991	1997	% Change
Argentina	6,092	11,919	96%
Brazil	13,893	51,460	270%
China*	96,761	120,106	24%
India	53,394	57,386	7%
Italy	40,142	45,844	14%
Lithuania	2,483	3,827	54%
Philippines	3,320**	3,770	14%
Russia	28,716	36,237	26%
Sweden	11,866	13,210	11%
UK	67,704	100,029	48%

Source: International Publishers Association

* China: figures for 1993 and 1996

** Relates to 1992

Overseas investments and the amount and kind of technology transfer by Germany, Japan, and the United States of America seem to be affected significantly by a recipient country's system and level of IP protection.⁴⁶ In spite of the lack of quantitative evidence regarding the impact of IP protection on developing economies, there seems to be agreement that a positive, two-way, and mutually-reinforcing relationship between IP and international trade exists, i.e. IP protection enhances international transactions and vice versa.⁴⁷ Moreover, there are short-term and long-term gains and losses that should be considered. As regards patents, the literature has shown that "patent protection enhances economic growth rates once a particular level of development has been reached."⁴⁸ Recently, there have been indications that IP protection may also be directly or indirectly influenced by wide and intensive discussions on IP policies, e.g. the debate on IP in the fields of biotechnology and genetic resources, plant variety and farmers rights, the emerging patent debate over the human genome mapping projects, genetic resources, biodiversity, traditional knowledge, folklore, and other areas of intensive intellectual and commercial activity.

Intellectual property has become a common feature in business regulation, especially in Europe and the United States of America.⁴⁹ It influences the behavior of firms when dealing with investment in innovation projects or product differentiation,⁵⁰ mergers and acquisitions (see Box - 2.10), technological alliances, joint ventures, and licensing.⁵¹

BOX-2.10 IP-BASED MERGERS AND ACQUISITIONS

In November 1997, Texas Instruments paid a staggering US\$395 million for Amati Communications, a small California-based company founded by Professor Cioffi at Stanford University. The figure surprised many as it appeared extremely high given Amati Communications' annual sales and financial situation. Why would a large semiconductor company pay such a high price for a small Silicon Valley start-up? The answer is simple. Amati Communications held 25 key patents on Digital Subscriber Line (DSL) technology which Texas Instruments considered crucial for entering the DSL market. The 25 patents covered some important areas of next-generation modem technology which have been adopted by the American National Standards Institute as the standard for DSL. Owning Amati Telecommunications' patents allowed Texas Instruments to acquire a leading position in the new technology as well as promising profits from licensing the technology to other firms.

Ownership of other forms of intellectual property, such as trademarks, may also be a decisive factor behind mergers and acquisitions (M&As). Indian tea-maker Tata Tea, for example, recently acquired UK-based Tetley Ltd. declaring that one of the main reasons for the acquisition was to obtain access to a global brand name and a global distribution network. The acquisition of Tetley enabled Tata Tea to expand its operations and obtain a globally recognized trademark to sell its products worldwide.

The past two decades have seen a great expansion in M&As, which have been growing at an annual rate of 42 percent and reached US\$2.3 trillion in the year 2000. Reasons for domestic and cross-border M&As are multifold, including advantages relating to economies of

scale and access to new markets. According to the *World Investment Report 2000*, "the second main motivation for firms to merge and acquire an existing company, rather than to grow organically, is the quest for strategic assets, such as *R&D or technical know-how, patents, brand names*, the possession of local permits and licenses, and supplier or distribution networks" [italics added].

Source: Rivette and Kline, "*Rembrandts in the Attic*"; *World Investment Report 2000: "Cross-Border Mergers and Acquisitions and Development"*, UNCTAD, 2000.

There are ways to stimulate innovative activity, such as government-funded R&D, encouraging use of savings and other resources of the inventor's family for capital investment, and more recently, facilitating the participation of the so-called "investment angels."⁵² However, the influence of IP has been growing steadily on its own, especially in knowledge-driven areas such as information technology, communications, and biotechnology.

IP PROTECTION AS GROWTH POLICY

Intellectual property protection is often seen as an instrument of industrial policy that has wide-ranging ramifications on the economy.⁵³

In the context of developing countries, two factors define the environment for acquiring technological capability. On the one hand, developing countries realize that to join the global trend towards greater free trade and to encourage foreign investment, adequate IP protection is essential.⁵⁴ On the other hand, the amount of technological knowledge that is in the public domain is much greater than just two decades before.⁵⁵

In every country there are bright people who have the ability to innovate, and it is hoped that the capacities of such people are invested positively for national economic development. The IP system can and does play a crucial role in this regard, in particular, by making available to them, through patent information, the most up-to-date technological information; the IP system should also prevent the "exportation" of knowledge-creating national capacities to other countries which can better exploit

them. In one country, for example, commercially significant innovations made at the national university were being disclosed abroad for patenting and development by others in Canada, Mexico, and the United States of America, since the local patent law was considered inadequate by university officials. This meant that value would be added abroad rather than in that country.⁵⁶

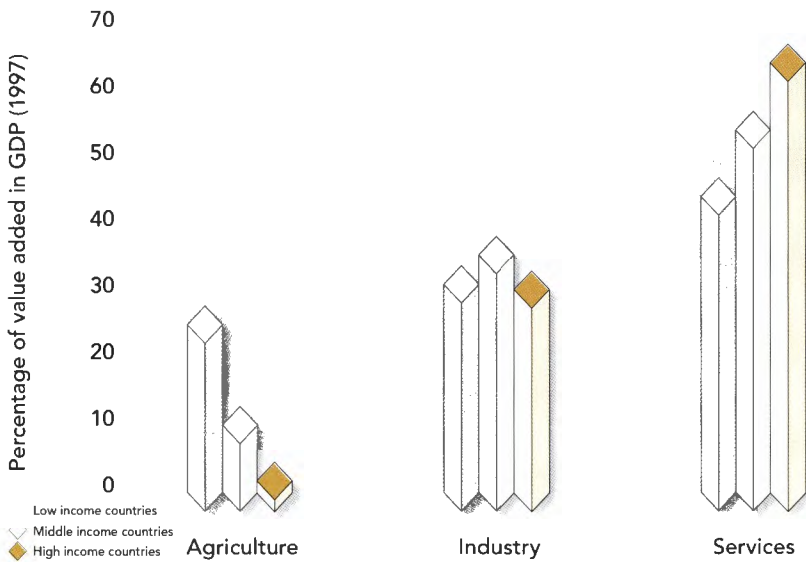
The effects of IP on economic development are sometimes tempered by the perceived availability and strength of IP protection.⁵⁷ For example, higher levels of IP protection for a firm's technologies and business methods could conceivably encourage the firm to invest in the training of its workers in order to enhance productivity and competitiveness. In the area of venture capital development, unless there is perceived adequate IP protection, individual inventors and small companies tend not to disclose their innovations during venture partnership negotiations for fear of losing ownership or control.⁵⁸ In the agricultural sector, where governments are traditionally reluctant to invest in research, funding from the private sector is often sought. However, in many cases, the private sector is unwilling to invest in research because it is not able to protect research outputs.

Strong views prevailed in the 1970s that since "developing countries were not technologically at the forefront, the incentives provided by IP, and patents in particular, for investment in research and development were not meaningful".⁵⁹ In situations where only low levels of IP protection are available, as in most least developed countries (LDCs) and certain developing countries, companies often rely on older, off-patent or unpatented technological solutions. Many inventions from developing countries, particularly in state-funded universities, have not been recognized as patentable. Thus, potential technological advances often never get to see the light of day.⁶⁰ In a recent electronic conference on the subject, a recommendation was made to the World Bank that urging and assisting developing countries to establish higher levels of IP protection should be the preferred approach in the field of biotechnology, so that greater market value can be considered locally as biological resources are developed, rather than promoting what is essentially the continuing export of raw materials through material transfer agreements.

VISIBILITY OF IP IN POOR COUNTRIES

Chart - 2.11 shows the difference in economic output (value added in GDP) according to a country's income level. Because of these differences in the structure of output, developing countries may use and develop different types of technologies and consequently benefit from IP in different ways.

CHART-2.11 DIFFERENCES IN STRUCTURE OF OUTPUT ACROSS INCOME GROUPS



Source: *World Development Indicators, World Bank*

In the manufacturing sector, it is very likely that the main impact of IP protection would be on the modernization of machinery and manufacturing processes. But in the poorest regions of the world, where people live on less than a dollar a day, less than 5 percent of economic activity relates to manufacturing.⁶¹ Intellectual property activity will have to be relevant to the economic priorities of the country. It is clear, that while an IP regime can bring out the potential for innovation, creativity, and growth in the national economy, it is not by any means a cure-all. Not only are an

adequate legal infrastructure and progressive policies on protection of intellectual property required, but also active national IP policies and positive and widespread public conviction and awareness. Chapters 4, 5 and 6 address how IP, specifically in the patent, trademark, geographical indications, and copyright fields, can promote economic development.

- 1 Paul M. Romer, "Why, Indeed, in America? Theory, History, and the Origins of Modern Economic Growth," **NBER Working Paper No. W5443** (January 1996); also **American Economic Review** 86, No. 2 (May 1996): 202-206.
- 2 Economic growth can be defined as "the increase in the real level of net national product, although the measure will then be sensitive to the way in which national product is measured." One should also bear in mind that the theory of economic growth is a long-run theory. David W. Pearce, ed., **The MIT Dictionary of Modern Economics**, 4th ed. (Cambridge, MA: MIT Press, 1992).
- 3 The law of diminishing returns states that when increasing quantities of a variable factor, e.g., labor or capital, are added to fixed quantities of some other factor (say land), first the marginal and then the average returns on the variable factor will, after some point, diminish.
- 4 Donella H. Meadows, Dennis L. Meadows, and Jørgen Randers, **The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind** (New York: Universe Books, 1972).
- 5 For a review of different growth models, see Gonçalo L. Fonseca and Leanne J. Ussher, "The History of Economic Thought" <http://cepa.newschool.edu/het/home.htm>
- 6 Gladys We, "What is Endogenous Growth Theory?" (1994) <http://thumb.cprost.sfu.ca/~we/misc/endogenous.html>
- 7 Joseph A. Schumpeter, **The Theory of Economic Development** (Cambridge, MA: Harvard University Press, 1934). First published in German in 1911.
- 8 An example of disruptive technologies and creative destruction has been elaborated in a case study about the development of various types of memory discs. See Clayton M. Christensen, **The Innovator's Dilemma** (Cambridge, MA: Harvard Business School Press, 1997): Chapter 7.
- 9 Joseph A. Schumpeter, **Capitalism, Socialism, and Democracy** (New York: Harper & Brothers, 1942).
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- 45 W. Lesser, "The Effects of TRIPS-Mandated Intellectual Property Rights on Economic Activities in Developing Countries," (WIPO Paper, April 2001, available at www.wipo.int/about-ip/en/index.html?wipo_content_frame=/about-ip/en/studies/index.html).
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<http://www.cptech.org/ip/health/pi/>
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- 52 Rich individuals interested in pioneering new business ventures or exploiting infant industry potential or opportunities (see also UNICE Annual Report, 1998).
- 53 "Economy" is understood in this case to fall within the broader context, to include general social welfare trickle-down effects from the use of new technologies and other creative and innovative ideas and their impact on the quality of human life (for example, impact on industrial productivity, educational opportunity, business growth, healthcare, decreasing poverty levels, and so forth.).

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CHAPTER 3

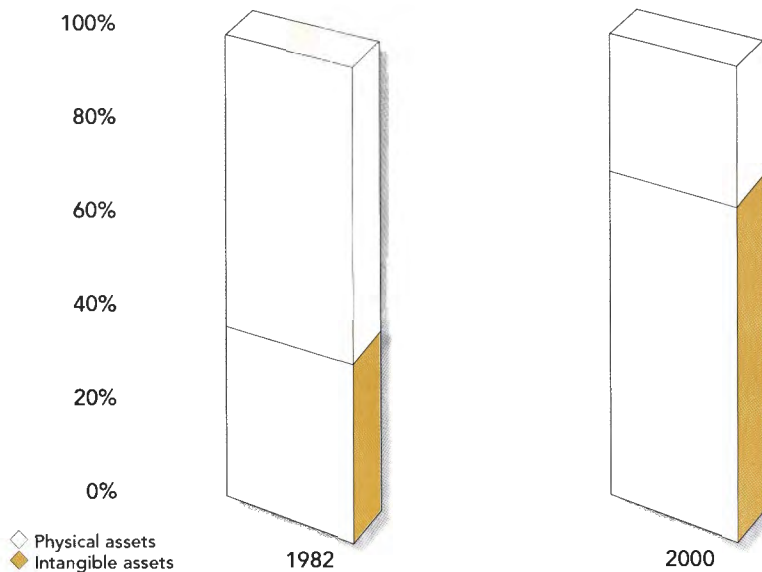
INTELLECTUAL PROPERTY, KNOWLEDGE AND WEALTH CREATION

Although tangible assets such as land, labor, and capital used to be the yardsticks of economic health, this is no longer the case. The new drivers of wealth in contemporary society are knowledge-based assets.¹

HIDDEN VALUE AND NEWFOUND WEALTH

IP assets are gaining ground as a measure of corporate viability and future performance. In 1982, some 62 percent of corporate assets in the United States of America were physical assets, but by 2000, that figure had shrunk to a mere 30 percent (see Chart - 3.1). At the beginning of the 1990s, in Europe, intangible assets accounted for more than a third of total assets. In 1992, in the Netherlands, for example, intangible assets accounted for more than 35 percent of total public and private investments. A recent British study shows that, on average, 40 percent of the value of a company is not shown in any way on its balance sheet.² IP is a significant component of intangible assets.

CHART-3.1 US COMPANIES' INTANGIBLE ASSETS AS A PERCENTAGE OF TOTAL ASSETS³



A survey conducted in 1993, sampling a total of 284 Japanese firms, revealed that IP assets accounted for 45.2 percent of corporate knowledge accumulated during a reporting period (covering both codified knowledge, such as that fixed in documents, and tacit knowledge that cannot be fixed, such as human skill sets).⁴

The bricks-and-mortar economy is, thus, being replaced with the economy of ideas in which IP has become one of the major currencies. In the new economy, wealth is generated through creating and capturing the value of knowledge. Throughout the history of human civilization, wealth was based on the possession of physical assets. Today, however, the paradigm has changed, and knowledge has become the new wealth.

The significant, positive impact that the protection of IP can have on the technological progress of a country can be clearly seen at the macroeconomic level. But, until recently, it was hard to assess the value of IP at the micro level, partly due to the lack of viable methods of valuation. IP assets have not been adequately reflected in corporate balance sheets.⁵

However, the environment surrounding the valuation of intangible assets has significantly changed over the last decade. This chapter will discuss these changes and the recent developments and efforts to find a robust way of valuing IP assets. It is through these efforts to assess the hidden value of IP that many have realized how and to what extent IP has contributed to, and will continue to increase, company earnings.

INTANGIBLE ASSETS, IP, AND ACCOUNTING

With the growing realization of the hidden value of IP, companies are increasingly managing and wielding their patents, not just as defensive protection against intellectual theft, but as an active and powerful tool to sharpen their competitive edge, increase their sector influence, and enhance their reputation as market innovators.⁶ Discussions on these issues at the international level have begun to emerge, particularly regarding the extent to which IP is seen as a new form of capital and an ingredient for success in business.⁷ Shareholders are increasingly sensitive to the value of IP assets and are using them as an indicator of company earning potential.

It has been said that “intellectual creation can make economic sense only when we wake up the innovator in an entrepreneur and also the entrepreneur in an innovator.” Globalization, technological development, and the Internet have brought a new realization of the worth of IP to entrepreneurs and innovators, and both are waking up to the need to protect it and to build “a strong bridge between invention and the market place.”⁸

In the new economy, innovative thinking is as valuable as skill. When vast generic information is creatively managed, business ideas spring forth as value-added knowledge. Often, giving knowledge a central place in business strategies is the key that makes both traditional firms and new start-ups competitive, successful and unique. Intellectual capital embodies the results of innovative knowledge management. Today, IP rights count heavily amongst the intangible assets of enterprises, along with other proprietary knowledge-like business procedures.

Modern competitive management is mindful of the strategic use of IP, and creates the environment for innovative thinking and knowledge-mining by its workers (e.g., sharing of skills among knowledge teams, strategic selection of innovations for IP protection, and valuation of IP assets).

Business in the new economy depends largely on stable and long-term relationships based on trust and win-win partnerships, and the careful balancing of new knowledge creation and creation of benefits for civil society. An IP-minded management approach provides the bargaining power to exchange intellectual assets and to develop more advanced strategic partnerships. In the market for patented technologies, M&As, and business-to-business (B2B) relationships, the positive valuation of IP is a driving force. Intellectual property also allows firms to establish a robust brand (trademarks, domain names, etc.), which is essential to cultivate recognition and trust in the Internet environment. The creation and exploitation of intellectual assets by empowering knowledge workers are fundamental strategies for firms. IP provides important motivation and incentives to workers through the recognition and rewarding of their intellectual contribution to the process of internal assets generation and the seeking of legal protection thereafter.

In the rapidly changing markets where products and services have shorter life cycles, firms need a decision-making system that allows accurate strategic evaluation of intellectual assets and swift action to secure legal protection of IP rights. The tactics of “file first and evaluate later” seem to be viable for those assets that have uncertain possibilities of commercialization.

INTANGIBLE AND IMMEASURABLE

Every firm has a portfolio that includes both tangible and intangible assets, including IP. These IP assets have the potential of significantly contributing to an increase in the return to investors. Firms that fail to fully comprehend and realize that potential run the risk of lost revenue, poor positioning, diminished market value, and possible collapse.⁹

According to Generally Accepted Accounting Principles (GAAP), assets are composed of (a) current assets; (b) plant, property, and equipment (corresponding to tangible assets); and (c) other assets (corresponding to intangible assets). Though accountants have recognized the existence of intangible assets for many years,¹⁰ different types of intangible assets were aggregated in a class called “goodwill” without being specifically identified. In the 1960s, the wave of corporate M&As prompted a review of the accounting of intangible assets. In 1981, the United Kingdom enacted the Companies Act, which permitted firms to include intangible assets in their accounts. However, it was not until the 1990s that governments started to develop more specific standards for such assets. During the last decade, when the economy and business increased their focus on value-added, and became more services-oriented and knowledge-intensive, the proportion of intangible assets to tangible assets increased. Strategic alliances became popular as a way of coping with global market competition, and the value of M&As worldwide has, according to *The Economist*, continuously increased from US\$0.5 trillion in 1990 to US\$3.5 trillion in 2000.¹¹

VALUATION OF IP ASSETS

Intellectual property assets have emerged as an important factor in corporate strategy in the 1990s. One reason the new economy has been called invisible is that old accounting methods have trouble monitoring it.¹² In response to the trends, legislation addressing this issue has been drafted in many countries. In the United States of America, the Omnibus Budget Reconciliation Act of 1993 introduced the definition of several classes of intangible assets (for example, goodwill, going concern value, lists of customers, patents, copyrights, formulas, processes, designs, patterns, know-how, and licenses) and allowed firms to amortize the cost of such assets.

The lack of reliable and widely accepted accounting standards for intangible assets resulted in differences between companies' book values and their market capitalization. For example, a review of the accounts of the 350 largest British companies with a combined total market capitalization of US\$2,167 billion revealed that, of that value, total balance sheet assets amounted to US\$603 billion and intangible assets a mere US\$38.9 billion. This leaves an unexplained gap between market capitalization and balance sheet assets of about US\$1,500 billion or 72 percent.¹³ Accordingly, in parallel with the development of national laws, regional efforts at coordination have been made. For example, since its establishment in 1977, the European Accounting Association has tried to link the Europe-wide community of accounting scholars and researchers. This initiative has been dealing with the presentation and valuation problems associated with intangibles.¹⁴

At the international level, the International Accounting Standards Committee (IASC),¹⁵ an independent private sector body, has also been working to develop internationally acceptable accounting standards. The IASC publishes its standards in a series of pronouncements called International Accounting Standards (IAS). In 1998, IASC published IAS 38, a revised standard on intangible assets.¹⁶ It applies to expenditures on advertising, training, start-up, and R&D activities. One of the main features of IAS 38 is the requirement that an intangible asset should be recognized in financial statements only if it is an identifiable asset that is controlled and clearly distinguishable from an enterprise's goodwill. Intangible assets should be amortized over the best estimate of their useful life. The

disclosures on intangible assets should enable users to understand the types of intangible assets that are recognized in the financial statements and the movements in their carrying amount (book value) during the year.

In contrast to the keenness of some accountants and government authorities, many firms have been slow in introducing full-fledged strategic management of IP. This is probably due to the fact that, in many countries, recognition of IP as a natural part of management's responsibility has not included the practice of assessing its value.¹⁷ However, to meet the requirements on disclosure of assets, effective methods of assessing the value of intangible assets, including IP, are needed. Experts have not found a robust method that could fully satisfy firms in different sectors of industry and this may also be another reason which prevents many firms from systematically assessing the value of IP.¹⁸

VALUATION METHODS

The methods for the valuation of IP so far developed are either qualitative or quantitative. Qualitative methods provide different scores or rankings based on certain assessment criteria. Quantitative methods provide actual figures for the value. Valuation methods may be divided into the following three groups:¹⁹

(a) Cost Approach

The expenses for acquiring IP from external sources or for generating IP assets internally are indicated. This method measures future benefits by quantifying the amount of money that would be required to replace the future service capability of the property. The value is subject to amortization and write-downs.

(b) Income Approach

The income approach focuses on a consideration of the income-generating capability of the property. The underlying theory is that the value of property can be measured by the present worth of the net economic benefit on the assumption that IP is capable of producing the income. It is generally agreed that this approach often proves to be the most reliable for the valuation of IP.

(c) Market Approach

The market approach is the most direct and the most easily understood appraisal technique. It measures the present value of future benefits by obtaining a consensus of what others in the marketplace have judged it to be. There are two requirements: the existence of an active and public market and an exchange of comparable properties. Until recently, these conditions were considered difficult to meet. However, the emerging web-based patent exchange markets may change the picture as the next section will describe.

VALUATION OF IP IN THE PRIVATIZATION CONTEXT

The issue of privatization (simply defined as the transfer of assets from the state to the private sector) was recently identified as having significant influence on IP policy and strategy formulation, and vice versa.²⁰ WIPO's study on privatization, carried out by an advisory panel, readily identified the question of valuation of IP assets as a key and possibly seriously under-researched area with clear relevance to decisions to privatize or not, and highlighted many examples where IP assets had possibly been undervalued, or not valued at all. The panel noted that existing international accounting standards and valuation methodologies might be inadequate in providing a sound foundation for valuing intangible assets, including IP assets in processes that were immensely important to the economies of many countries, in particular those economies in transition to free-market principles. While the panel concluded that there is virtually no overlap in current literature on privatization and IP as such, there was much interest in the assertion that IP figured significantly in the valuation of intangible assets and, therefore, in the estimation of a firm's capitalization and strategic value, which in turn is important in dealing with the question of privatization of public enterprises.

One of the striking figures brought before the panel was the suggestion that between 50 and 80 percent of the value created by a firm originates from intellectual capital rather than from traditional physical assets, pointing to the shift in economic valuation from physical capital to intangible and intellectual capital. This shift is apparent in the recent strategic

patenting by multinational firms, whereby patents are considered valuable not only in the originally intended sense of protecting innovation, but also in respect to potential business income from licensing fees, protection and leverage against competitors, or even extra income unrelated to the main business of the firm. Texas Instruments, for example, is well-known for pioneering the process of applying for patents on innovation discovered by its R&D teams in circumstances where the patents may have general scientific and technical application. More and more companies are realizing that aggressively asserting the existence of their patents can generate many business advantages, and are spending large sums of money undertaking a patent portfolio audit to identify economically relevant patents.²¹

Valuations of IP assets, such as trademarks, have grown to become an important component of a firm's capitalization. According to Interbrand, in 2001, the worldwide trademarks for Coca-Cola, Disney and Ford were 61, 54 and 66 percent, respectively, of the capitalization of those companies, and were worth US\$69, 32.5, and 30 billion respectively.²² A decade or so ago, very few companies entertained such a concept of trademark valuation.

MARKETING KNOWLEDGE

A report issued by PricewaterhouseCoopers in 1999 found that the global IP licensing market had soared over the previous ten years to reach more than US\$100 billion. In this regard, patent information plays an important role, in particular by assisting in the assessment of the potential for commercialization of IP. A good illustration of this emerging market is that IBM and the Internet Capital Group have joined the growing list of companies creating online exchanges for the evaluation, buying, selling, and licensing of patents and other forms of IP. IBM contributed the assets of its IP Network, a content-oriented website that provides a range of free information about European, Japanese and US patents.²³ Several IP information brokerages were set up to provide value-added evaluation of patent information and services for patent licensing.²⁴ Recently, IP assets have also been recognized as financial assets. Sellers and buyers of IP can manage their IP as financial assets just as investors in stocks, options and other financial instruments.²⁵

THE EMERGING CYBER MARKET FOR PATENTS

According to the British Technology Group (BTG), a consulting firm, just 3 percent of the commercial potential of global IP was realized in 1999; that figure translates into about US\$110 billion out of a US\$3 trillion pie. Of that \$110 billion, only some \$500 million came from universities, where the bulk of R&D takes place. IBM alone, which has long set the standard for both the volume of patents issued and the revenue generated from licensing them, created an annual royalty stream of \$1.25 billion. However, most corporate giants were inclined to guard their patents, trademarks, and other IP more closely.

"A year and a half ago, we did a survey and realized that we were spending US\$1.5 billion on R&D, but we were using less than 10 percent of it in our own products," said Jeff Weedman, vice president of global licensing and external ventures of Proctor & Gamble (P&G). The company, which holds over 27,000 patents worldwide and is one of the biggest users of WIPO's PCT, has changed its IP philosophy dramatically, and now all its patents, as well as other technologies, are available for licensing, sale, or joint ventures.

Under pressure to increase revenue, many companies are offering for sale or license, at new online IP exchanges, everything from prized R&D secrets to sharp, in-house information technology systems. The buyers are other big companies looking to slash R&D costs by buying the results of others' research.²⁶ For patent valuation, the Patent & License Exchange uses a mathematical model based on the Nobel Prize-winning option theory developed by Robert Merton, Myron Scholes, and Fischer Black.²⁷ This has proved to work well in analyzing the differing claims that debtholders and shareholders have on a firm. These business-to-business marketplaces offer, users say, a fast, efficient, and extremely low-cost way to transfer technology and build revenue based on inventions that otherwise might not have seen the light of day.

The emerging recognition of IP and its role in knowledge and wealth creation has been driving the development of new and better valuation and accounting methods for IP as an intangible asset, or a new and modern form of knowledge capital in the business world. IP seems to be accepted

as the commercial embodiment of new knowledge and as an instrument of wealth creation. Its tradability as an economic good has found a new expression in the form of knowledge and technology markets. The new knowledge market takes advantage of web-based technologies and the most recent marketing tactics. The recognition of IP in the market is further convincing evidence of its growing economic impact.

MODERN IP MANAGEMENT AND THE NEW ECONOMY

Intellectual property management is becoming a major element in corporate business management. It affects M&As, generates joint ventures, forges cooperative R&D agreements, and is the basis of licensing agreements. Companies are forging alliances with each other in order to heighten the value of their IP and to obtain mutually beneficial competitive advantages. Often such alliances will give the companies involved substantially increased clout in their particular field of technology, allowing them to impose their standards on competitors in that sector. Strategic positioning of IP assets can make a difference to a company's profit. Such strategic positioning enhances revenue through better deployment of R&D and market intelligence, and facilitates licensing income, as well as the potential for M&As.

Intellectual property assets can contribute significantly to a company's market value. Several companies have a major part of their market value in IP assets; these include Walt Disney, Microsoft, and P&G. Evidence shows that in each of these three companies, more than 80 percent of their value is associated with IP and intangible assets.²⁸ Microsoft is said, for example, to have a book value of US\$90 billion. However, its market capitalization value is estimated to be around US\$270 billion. The major part of the extra \$180 billion is said to come from IP assets, including trademarks, patents, trade secrets, and know-how.²⁹

In order for corporate management to maximize the assets of a firm, a deliberate effort must be made to understand and focus on IP in the business world.

NEW CORPORATE IP MANAGEMENT

Possession and management of IP assets is becoming a major determinant of company success or failure. IP management, formerly confined to legal departments, is increasingly being handed over to proactive IP departments. This is especially true in some of the new technology firms which are developing so fast and making huge investments in R&D. "The market for biotechnology is expected to be worth US\$38 billion by the year 2005... On average, the biotechnology industry ploughs some 45 percent of its annual income into R&D. That means nearly half the value of the industry is embedded in its intellectual capital. The trouble is that intellectual capital is a very plunderable good: it can be stolen quite easily, copied and then sold without authorisation... patenting is seen as being important to researchers."³⁰ (For further discussion on the patent protection of biotechnology, see Chapter 4.)

What changes in IP management are taking place in those firms? Here are some examples:

- By licensing CD technologies to competitors at an early stage, Philips and Sony prevented them from developing alternative standards, which could have provoked a long and draining format war like the one between the video formats VHS and Betamax.³¹
- IBM has generally stayed away from having to make large acquisitions, in part because it has been able to leverage its IP into new products and businesses, investing more than US\$5 billion annually in R&D. IBM's aggressive IP effort boosted patent licensing royalties 3,300 percent between 1990 (\$30 million) and 2000 (\$1 billion).³²
- Hitachi progressively developed its patent strategy and earned \$455 million in 1996. Its earnings expenditures ratio (EER) grew from 0 in 1990 to 4.5 in 1996, going through four stages of patent strategy evolution.³³

Intellectual property management is occurring not just in the private sector. For example, in 1987, an eminent international scientific research institute, CERN (European Organization for Nuclear Research), created an Industry and Technology Liaison Office to stimulate interaction with industry and to assist in issues related to its IP. The liaison office also ensures that the organization's IP is adequately protected and correctly exploited. Some universities also have IP offices whose sole function is to manage IP assets (see Chapter 4).

PATENT MAPPING

Making the care of IP a core part of marketing strategy is not just an offensive weapon; it is crucial for defense as well. An effective way to analyze trends in R&D in certain fields of technology, and also competitors' R&D and marketing strategies, is to make a so-called patent map in which all significant patents are shown along with the technological links between them. The patent map may include an analysis of how a company's patents and those of its competitors relate to the company's technology and products. This is not just an exercise to avoid IP infringement but a tool to understand trends in technology and plan a company's strategy for investment in R&D and marketing. Until recently, many executives thought it unnecessary to spend the time and money to map out the patent landscape, but now it is an essential factor in corporate strategy. Patent-mapping efforts that used to take months can now be done in hours or days. The relationship between patents, competitors and the corporation's research and business activity can now be presented in 3-D reports that highlight patterns and relationships in technology development.

Many commercial databases and software packages have been developed to assist companies in managing IP. Such services and products provide a set of dynamic analytic tools applied to a database of worldwide patents that allow customers to gain a decisive insight into their innovation asset opportunities. They have a platform that allows clients to create powerful visualizations of their marketplace, their innovation assets, and their competitors' innovation assets. This promotes the

understanding of industry trends and opportunities and facilitates rapid, informed decisions in key strategic areas such as R&D, M&As, technology licensing, and competitive intelligence.³⁴

THE NEW ECONOMY, THE INTERNET, AND IP

Intellectual property is on its way to becoming the ultimate asset.³⁵ What has caused this transformation is the advent of the so-called knowledge economy supported by the Internet, which completely changed the coverage, amount, and speed of access to information (from which knowledge can be made). Increasingly, the creation of wealth – and its attendant social and cultural benefits – hinges on the generation and management of the three “i”s: innovation, information, and ideas, using another “i” – the Internet. They are the fuel that drives the incredible forward thrust of technological development today, and possession of (or access to) them is vital for any company that wants to stay ahead of the field – whether in creating innovative new products or finding innovative and cost-effective ways to manufacture old ones. Globalization is raising the financial stakes in these new products and processes, as a truly worldwide marketplace becomes increasingly accessible through new communications technology. The economic landscape – and the place of IP in it – has changed completely.

A major element in the new topography is the Internet and its user-friendly graphical interface, the World Wide Web. Other inventions have had a profound effect on society (the wheel, the internal combustion engine, the radio), but it is difficult to think of one that has had such an immediate and wide-ranging impact. In the first 4 years of its existence the Web reached 50 million users (the telephone took 74 years to attain that figure), and it is said that traffic on the Internet doubles every 100 days.³⁶ The casting of this particular net (and the spinning of the web) has irrevocably linked individuals and organizations all over the planet, creating a global grapevine, a virtual talking-shop, a cyber-marketplace, a digital “Delphic oracle”, a vast electronic sea of knowledge, accessible to all, transcending existing boundaries and transforming how, where, and with whom we communicate and do business. “A century ago, Standard Oil of New Jersey went overseas in search of oil. In the late

1990s, America Online went around the world in search of subscribers. In 1899, the United Fruit Company needed to be in Central America because of that region's advantages in the cultivation of bananas. Nowadays, Yahoo! needs to be everywhere because the more visitors it attracts the higher its stock price."³⁷

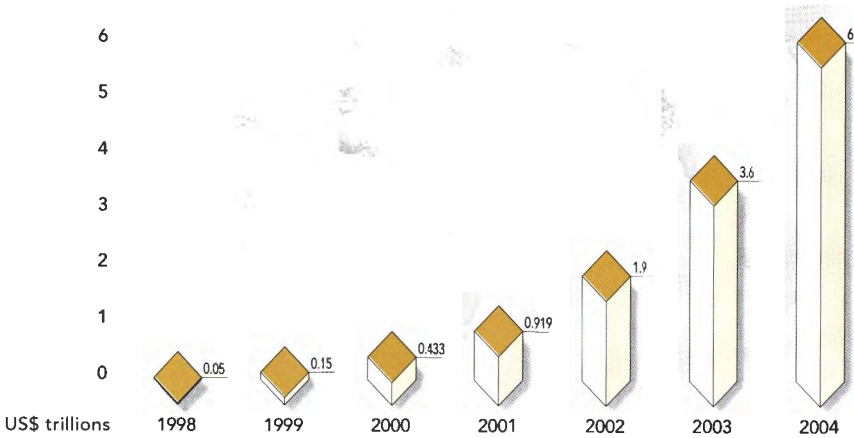
From education to entertainment to e-commerce – the possibilities of the Internet are vast. All these changes have reinforced the importance of knowledge and have become effective tools to optimize the benefits of that knowledge and of IP. For example, the Internet has allowed researchers and inventors to access more easily the almost overwhelming volume of electronically stored patent information drawn from patent documents filed with national and regional patent offices and under the WIPO PCT.³⁸ This has, in turn, triggered a new growth industry with the rapid rise of on-line service providers offering patent search and management facilities that enable clients, quickly and efficiently, to ensure the originality of their own research; to track down inventions of use to them for further innovation; to obtain an overview of trends and new R&D activity in a particular area of technological development; and to monitor the marketing strategies of competitors by tracking the countries in which they are seeking patents. The possibilities that modern technology offers for making full and creative use of patent databases can also lead to happy discoveries of ideas with great, but unexploited, market potential, such as the antibiotic azithromycin, uncovered by the pharmaceutical company Pfizer, which came across the patent by chance when searching the United States Patent and Trademark Office (USPTO) database (see Chapter 4).

The Internet is creating a worldwide human and business network of networks. Some pundits and business managers have suggested a new maxim to survive in the new economy – think globally and act locally. "Glocalism", that is, to be global and local, allows people to assimilate aspects of globalization into their own country and culture in a way that adds to their growth and diversity, without overwhelming local cultures.³⁹ Empowerment by the Internet provides local industries and communities with a fresh opportunity to realize the value of their indigenous intellectual assets such as cultural inheritance and traditional knowledge, which may potentially have a global market (for further details, see Chapter 7).

ELECTRONIC COMMERCE AND THE IMPACT ON IP

As well as facilitating innovation and allowing its more efficient management and exploitation, the Internet has also raised some challenges for the IP community. One such, which has attracted a considerable amount of recent media attention, concerns innovative ways of conducting business on-line. Electronic commerce (e-commerce) grew from more or less nothing in 1995 and is expected to become a trillion dollar industry within a decade. Business-to-business e-commerce in 2000 represented a 189 percent increase over 1999 and, while valued at US\$1.9 trillion in 2002, is anticipated to reach US\$6 trillion by 2004 (see Chart - 3.2).⁴⁰ With such high stakes at play, there has been a rush to patent methods designed to make it easier for buyers and sellers to conduct cyber-business. The most well-known example is Amazon.com's famous *one-click* shopping, enabling customers to order, pay for, and authorize delivery of their purchases with one click of their mouse. Another classic example is Dell's 40-odd patents protecting on-line techniques that enable customers to order a customized computer assembled to their individual specifications. In fact, new business methods cover everything from Priceline.com's system of on-line reverse auctioning to Chase Manhattan Bank's techniques for check imaging and credit card authorization (for further discussion on the patentability of business method inventions, see Chapter 4).

CHART-3.2 PROJECTED E-COMMERCE GROWTH



Source: Gartner, Inc., http://www4.gartner.com/5_about/press_room/pr20010313a.html

Another Internet-generated battle in the IP area is being fought over the eviction of cybersquatters who have taken over trademarks to which they have staked a claim in bad faith. Cybersquatters register domain names (essentially website addresses), which they have no intention of using and that are identical or similar to trademarks or famous names, and then try to sell them back to the holders of the mark or famous name at a profit. Cybersquatters, and some of the cases brought against them under the WIPO domain-name dispute resolution procedure, have received wide-spread coverage in the press, highlighting the importance of trademarks⁴¹ and their new manifestation as website identifiers, in the world of commerce. The domain name issue is yet another example of how the Internet has given a new dimension to a traditional form of IP and has forced the IP community to find speedy and efficient solutions in order to resolve a problem of considerable economic importance (for further discussion, see Chapter 5).

Another challenge to IP is digital piracy caused by the ease and speed with which perfect digital copies of books, photographs, music, and film can be made and distributed on the Internet to anyone, anywhere in the world. The fight against such illegal distribution of copyrighted materials is being fought with technological weapons, but digital pirates are adept at finding their way through barriers put in place by encryption and copy protection techniques. While many copyrighted works can be shared with friends and acquaintances or even large numbers of fellow Internet-users at the click of a mouse, many of the new cyberpirates are often unaware that they have committed an illegal act. For example, many Napster users have made their recordings globally available without knowing that their act is illegal. Even now, software is being developed to enable users to share music files through peer-to-peer exchanges, making it more difficult to trace such digital transfers and to crack down on them. Another example concerns Stephen King, the popular author, who put a new spin on the concept of electronic self-publishing. As an experiment, King posted a chapter of his new book *The Plant* on the Internet at regular intervals, but only as long as his readers continued to pay him a dollar for each new chapter (routed on-line through Amazon.com). The experiment ended after the sixth chapter, due to a fall-off in payments. The difficulty of controlling copyright in cyberspace has given rise to a rethinking of the way in which royalties are collected (for further discussion, see Chapter 6).

TABLE-3.3 E-COMMERCE AND ITS IMPACT ON IP LAW AND POLICY AND OTHER RELATED AREAS

Characteristics	Phenomena	IP-related issues
Globality	Cross-border impacts	Harmonization of IP laws, recognition of judgments, and enforcement
Interdisciplinary	Emerging new intermediaries and dis-intermediation	On-line provider's liability for IP infringement, broadcasters request for their rights
Digital technology	Perfect quality of digital copies	Review of the definition of copy
Detection, anonymity, and privacy	Cyber-piracy and fair use (e.g. Napster)	Difficult enforcement of IP rights, watermarking of copyrighted works.
Speed of light	A widened gap between legislative efforts and technical changes, no effective judicial system	Internet-based consultation for international policy formulation, emerging solution of using alternative dispute resolution systems (mediation and arbitration)
Technical features	Domain name, Internet standard protocol	Domain name disputes and conflicts with trademarks
Internet governance	Minimalist v. Maximalist	Policy difference between countries (the extent to which governments implement regulatory measures)

E-commerce has already begun to have an extraordinary impact on the architecture of our markets and regulatory structures, and to raise issues that implicate different sectors of legal interest. As IP systems have been independently developed in different countries on the fundamental principle that each state has sovereignty over IP protection and enforcement within its territory, the international dimensions of e-commerce and the IP-related questions emerging from it complicate the development of solutions and caution against national interventions that would ignore potential cross-border impacts. They also have horizontal implications for other areas of law and policy as summarized in Table - 3.3.

- 1 Steven M. H. Wallman, "In Pursuit of Intellectual Capital," foreword to **Hidden Value: Profiting From the Intellectual Property Economy**, ed. Bruce Berman (London: Euromoney Publications PLC, 1999): 9.
- 2 Gordon V. Smith and Russell L. Parr, **Valuation of Intellectual Property and Intangible Assets**, 2nd ed. (New York: John Wiley & Sons, 1994): 117-119.
- 3 Source: Brookings Institution.
- 4 Juniiichi Kikuchi and Yasuyuki Ishii, "A Survey on the Economic Impact of Intellectual Property," Institute of Intellectual Property, Japan (1993).
- 5 Russell L. Parr "Intangible Assets Dominate Hidden Corporate Value," in **Hidden Value: Profiting from the Intellectual Property Economy**, ed. Bruce Berman: 64.
- 6 The accounting firm, PricewaterhouseCoopers, estimates that two thirds of the US\$7 trillion market value of all publicly traded US companies is not reflected on their balance sheets because it lies in their intangible assets, such as intellectual property.
- 7 See also – Patrick H. Sullivan, **Value-Driven Intellectual Capital: How to Convert Intangible Corporate Assets Into Market Value**, (New York: John Wiley & Sons, 2000) – for extended treatment of the subject.
- 8 S. K. Bijlani, WIPO document: WIPO/IP/MNL/00/3(b) (October 2000).
- 9 Bruce Berman, ed. "The Emergence of an 'Invisible' Asset Class," Introduction to **Hidden Value: Profiting From the Intellectual Property Economy**: 12.
- 10 In December 1944, the Committee on Accounting Procedures of the American Institute of Certified Public Accountants issued Accounting Research Bulletin 24, which directed that goodwill could be carried on the balance sheet as an asset.
- 11 "The Great Merger Wave Breaks," **The Economist**, (January 25, 2001).
- 12 Karen Lowry Miller, "A Run for the Money," **Newsweek**, (January 29, 2001).
- 13 Thayne Forbes, "To Have and to Hold," **Managing Intellectual Property**, (September 2000).
- 14 See discussions on this subject at the website <http://www.eaa-online.org>

- 15 The IASC was formed in 1973 through an agreement made by professional accountancy bodies from Australia, Canada, France, Germany, Japan, Mexico, the Netherlands, the United Kingdom, and the United States of America. Its objective is to achieve uniformity in the accounting principles that are used by businesses and other organizations for financial reporting around the world.
- 16 All proposed standards are available at <http://www.iasc.org.uk>
- 17 Danish Ministry of Trade and Industry, **New Trends in Industrial Property Rights** (Copenhagen: Danish Ministry of Trade and Industry, 1999).
- 18 Certain governments assisted their industry in developing suitable methods. For example, see Danish Patent and Trademark Office, *Management and Valuation of Patents and Trademarks: Consultants' Analysis prepared by Ernst & Young and Ementor Management Consulting* (Copenhagen: Danish Patent and Trademark Office, December 1999), <http://www.dkpto.dk>. In 1999, the Japanese Patent Office published *Patent-Related Evaluative Indexes*, in which a qualitative approach was proposed by suggesting five different ranks (A to E) for the valuation of patents.
- 19 Gordon V. Smith and Russell L. Parr, **Valuation of Intellectual Property and Intangible Assets**, 3rd ed. (New York: John Wiley & Sons, 2000): 175, 215.
- 20 The relevance of privatization to intellectual property was included in *Vision and Strategic Direction of WIPO (A/34/3)* endorsed by the Assemblies of the Member States of WIPO, 34th series of meetings (Geneva, September 20 to 29, 1999). Subsequently, WIPO studied a framework for understanding the impact of privatization on the IP area, and to build greater awareness of, and consensus on, the relevant issues. The valuation of intellectual property clearly emerged as one of those issues.
- 21 Report of the WIPO ad hoc Advisory Panel on Privatization (April 2001) <http://www.wipo.int>
- 22 <http://www.interbrand.com>
- 23 <http://www.delphion.com>
- 24 <http://www.pl-x.com>; WIPO PCT statistics; "Corporate Finance," *The Economist* (January 27, 2001); and "Corporate Secrets Up For Grabs at New Exchanges," *CNN Interactive* (November 15, 2000).

- 25 **Intellectual Property Monetization**, Nir Kossovsky, *WIPO Second International Conference on Electronic Commerce and IP (September 2001)* – <http://ecommerce.wipo.int/meetings/2001/conference/presentations/pdf/kossovsky.pdf>
- 26 *Dozens of brokers are offering such exchanges, including Cambridge, Massachusetts-based Yet2.com and Pasadena, California-based The Patent & License Exchange. In November 2000, Minnesota-based Global Commerce and Communication joined with NewIdeaTrade.com, a free online forum for buyers and sellers of inventions, trademarks, and patents.*
- 27 <http://www.pl-x.com>
- 28 Russell L. Parr, “Intangible Assets Dominate Hidden Corporate Value,” in **Hidden Value: Profiting from the Intellectual Property Economy**, ed. Bruce Bennan.
- 29 Bruce Berman, ed., “The Emergence of an ‘Invisible’ Asset Class,” **Introduction to Hidden Value: Profiting from the Intellectual Property Economy**: 24.
- 30 Evdokia Moisé, “Intellectual Property: Rights and Wrongs,” *OECD Observer (April 1999)*.
- 31 Alberto Torres, “Unlocking the Value of Intellectual Assets,” *The McKinsey Quarterly* 4 (1999)
- 32 Tom Foremski, *Financial Times (February 2, 2000)*.
- 33 Hisamitsu Arai, **Intellectual Property Policies for the Twenty-First Century: The Japanese Experience in Wealth Creation** (Geneva: WIPO, 1999): 34-37.
- 34 For example, Aurigin Systems (<http://www.aurigin.com>), introduced in Kevin G. Rivette and David Kline, **Rembrandts in the Attic: Unlocking the Hidden Value of Patents** (Cambridge, MA: Harvard Business School Press, 1999).
- 35 *Ibid.*
- 36 WIPO, “E-commerce Primer,” – <http://www.wipo.int/primer/index.html>
- 37 Moises Naim, *Financial Times (December 22, 2000)*.
- 38 For further information, see the WIPO Intellectual Property Digital Library (IPDL) at <http://ipdl.wipo.int>

- 39 Thomas L. Friedman, *The Lexus and the Olive Tree: Understanding Globalization*, (New York: Anchor Books, 2000): 295.
- 40 Gartner, Inc. – http://www4.gartner.com/5_about/press_room/pr20010313a.html
- 41 *Well-established trademarks have traditionally been recognized as valuable pieces of intellectual property and their new role as website identifiers has increased that value – which can be considerable.*

CHAPTER 4

PATENTS, RESEARCH AND DEVELOPMENT, AND NEW TECHNOLOGIES

“The patent system added the fuel of interest to the fire of genius”.
Abraham Lincoln¹

In the 20th century, we witnessed a series of technological breakthroughs. Indeed, it has been said that we are in the midst of a third industrial revolution as a result of rapid developments and interactions between six key technologies – microelectronics, computers, telecommunications, new materials, robotics and biotechnology.² The rationale for patents is that they stimulate economic and technological development and promote competition by creating a financial motivation for invention. However, as the world seeks to address the disparity in wealth between developed and developing nations, some critics have claimed that the patent system stymies development. These critics misunderstand the theory and practical application of the patent system. In fact, patents are a powerful tool for economic development. This chapter examines how the patent system works in principle and in practice to stimulate R&D, to generate new technologies, and to promote market competition. It also offers perspectives on how developing nations may wield the patent tool to sharpen and strengthen economic development strategies in the changing global economic environment.

THE RATIONALE FOR PATENTS – HOW THE SYSTEM WORKS IN THEORY

Abraham Lincoln was a master of the homespun aphorism, expressing a complex thought in a simple expression. The one quoted above aptly captures the rationale for patents. The “fuel of interest” – the profit motive – is a catalyst of scientific, technological and economic development. The metaphor is a good one because it suggests a dynamic process in which powerful forces are ignited.

That process starts with the grant of exclusive, legally enforceable rights to an inventor to make, use or sell products incorporating his invention for a limited period of time. Thus, the inventor receives an advantage in market competition. The patent system provides the inventor with an opportunity to gain revenues at three levels. First, the inventor may

recoup his costs (the expenses he incurred in developing the invention, usually capital, time, equipment and labor).

Second, the patent system makes it more likely that the inventor will make a profit (a positive return on the investment) from the unit sales of products incorporating the invention. The ability to achieve this profit (through higher volume of sales or higher prices than the seller of a similar product would otherwise have achieved) depends on whether the invention actually enhances the desirability of products, and whether there are substitutes or alternatives to the invention and the products.

Third, the patent system gives him the ability to gain revenues from licensing or assigning (selling) the patent to others who will exploit it in markets that the inventor does not wish to enter, using distribution resources that the inventor does not have, or combine the invention with other inventions and products to create new inventions and products. Such licensees and assignees pay royalties (payments in the form of a share of his sales) and fees to the inventor.

The inventor's reward is financial gain, and he is motivated to repeat the process again, investing some of his gain in new R&D for new inventions. This process becomes a dynamic cycle of change which generates changes in other areas. He is also likely to hire and train others, or transact business with others, who will in turn be motivated to invent and create products by the prospect of financial gain. Not only will the R&D lead to associated inventions by others, it is also likely to stimulate other economic consequences such as increased employment and training, and increased competitiveness of related products.

It is an oversimplification to say that the patent system is a tool to grant a simple exclusive right to an inventor. The exclusive rights granted by a patent are valid only for a limited duration (generally 20 years). They also are limited to and valid in only the country or jurisdiction that issued the patent. In the rest of the world, in all countries in which the invention is not protected by a patent, the invention may be used freely. As discussed below, the patent system is designed to strike the proper balance between the inventor's interest and the public interest.

Described in another way, the patent gives the inventor a temporary shelter from the forces of market competition. The shelter is a small one, limited to the precise terms of the claims of his patent, but it is sturdy and durable for many years. In this shelter, the inventor can market his inventions without fear that his investment will be swept away by competitors, or ravaged by price predators. He can work in the shelter, secure enough to be able to create new inventions, as well as to hire and train others to help him. Without the shelter, the inventor would have no incentive to make new inventions and start the process again. He would pack up his tools and go back to his secure job elsewhere.

The patent system does not grant an unqualified market advantage to the inventor. The shelter is exactly as big as the scope of the invention that the inventor has created. The patent only covers the invention exactly as it is “claimed” in the patent. There is nothing to prevent competitors from developing competitive inventions and products, and obtaining patents on such inventions, as long as they do not duplicate all of the claims of the patent. Indeed, as will be explained below, the patent system actually seems to generate competitive innovations.

Further, patents are only granted when the invention meets the strict requirements for patentability; generally that the invention must be “new, useful and non-obvious.” A patent is not granted simply because of hard work or large amounts of capital. The inventor must actually create something original based on his research and imagination, although he will invariably draw upon old data and inventions. The invention cannot be merely theoretical, but must be practically “do-able”. The exclusive right is time-limited; in most cases it lasts for 20 years from filing. The exclusive right generally does not extend to “fair use” – research and academic use of the patent. The patent is only valid in the country in which it is filed and issued, so innovators and businesses in other countries (in which a patent application has not been filed and issued) are free to use the invention.

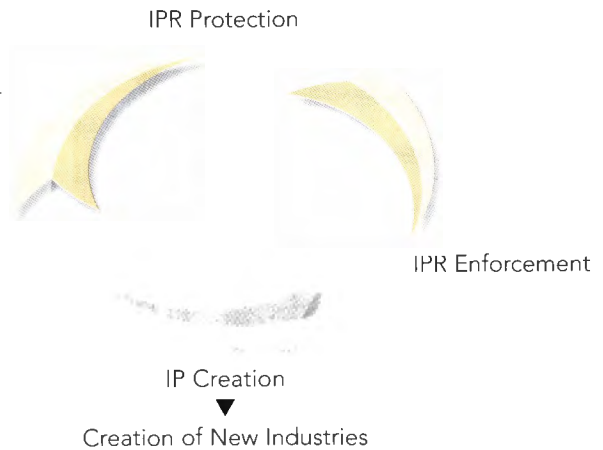
Even where the patent right applies, patent holders are often motivated to license others to use patents, as such licensing is often a profitable aspect of patent ownership and a way to reach "unserved or underserved markets" (geographic or sectoral markets that the patent owner may not wish to invest in or in which he does not have resources or capacity to invest). In such cases, the patent right is effectively shared and its benefits distributed. Further, patents may provide economic and technological benefits in the form of information because they are public documents. Most patent systems have the legal requirement that the application and patent fully disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the field of the invention. The requirement of public disclosure is one of the justifications for the patent right because the patent holder trades the disadvantage of full public disclosure of his invention and how it works for the grant of an exclusive legal right to its use for a limited period. Obviously, the decision to seek patent protection in a country in which there is inadequate enforcement of patent rights involves a risky leap of faith on the part of the inventor. Finally, abuse of the patent right combined with acts of unfair competition may be checked in some countries by anti-trust or competition law. In sum, for many reasons, the patent right is a limited one and permits quite a bit of flexibility in the use of the claimed invention by persons other than the inventor.

If one accepts as true that people are motivated by financial gain, then it is apparent that the opportunity to gain from innovation will have the effect of stimulating innovation and, if conducted on a broad scale, also stimulating the economy. Conversely, a high risk of losing an investment will demotivate inventors. A society that provides no legal shelter for its inventors is likely to have a weak economy.

THE CYCLE OF INVENTION

The dynamic nature of the patent system is described fully by Hisamitsu Arai, in "Intellectual Property Policies for the Twenty-First Century: The Japanese Experience in Wealth Creation", a vital resource for those interested in using the patent system to encourage economic development (see Chart - 4.1).³

CHART-4.1
CYCLE OF INTELLECTUAL
CREATION



The cycle describes how the patent system promotes technological and business competition because patent holders and their competition race to improve inventions and to create new ones. Generally, patent holders invest a portion of profits obtained from the commercialization of patented technologies in R&D. There exists, therefore, a cycle from an original invention to an improved invention, with the latter being the basis for further improvement. New inventions are constantly being created that are either improved versions of the patent or new inventions (see Box - 4.2). Each invention may be embodied in any number of products. Competitors will seek to invent new inventions that "avoid the claims" of a granted patent. This competition gives rise to new, often more efficient or advantageous ways of making similar products. The patent system serves as the framework to keep this wheel of invention turning. The cycle of intellectual creation also contributes to adaptation of foreign technology to local needs and markets because patents issued in one state are disclosed and may become the basis for improved versions or the inspiration for new inventions.

BOX-4.2 TOYOTA'S THIRD ATTEMPT

The classic model of innovation consists of a simple cyclical progression including the following stages: invention, patent, new product, profit, investment in R&D and back to invention. During the last decade of the 19th century, a number of Japanese companies, including the Toyota Loom Corporation, were working on the development of loom technology for the textile industry. Intensive R&D activity by small Japanese enterprises was complemented by active utilization of the patent system for the protection of the new technologies. At the turn of the century, however, the gap between the Japanese industry, still relying largely on wooden hand looms, and its European counterpart, benefiting since 1894 from the invention of the automatic loom, remained significant.

In 1896, Sakichi Toyota obtained a patent for a version of the power loom which resembled previous machines used in Europe since the 18th century and more recently in Japan. Despite the important technological achievement by Toyota, competition in the market proved so strong that the invention would not earn him sufficient profit to continue in the power loom business. Twice he tried to set up a business for the commercialization of his power loom patent and twice his business failed. Thirteen years after his first attempt, Sakichi succeeded in inventing an automatic loom. He introduced some important changes to the European automatic loom which gave him an edge over his competitors. A number of other patents were obtained to complement and fine-tune the invention and finally, in 1924, the Toyota Type G Automatic Loom reached the market. Kiichiro Toyota, Sakichi's son, reached an important agreement with Platt Brothers & Co. for the commercialization of the automatic loom. Platt Brothers paid Toyota £100,000 (equivalent to US\$25 million today) for the exclusive right to manufacture and sell the automatic loom in any country other than Japan, China and the United States of America. It provided a huge injection of capital for further investment in R&D. Toyota decided to invest the £100,000 as initial capital to set up an automobile company.

Source: Tadashi Ishii, "Industrial Innovation in Japan and the Role of the Patent System": Case Study of Toyota (presented at Conference, Washington University, St. Louis Missouri, October 2000).

PATENTS AND ECONOMIC DEVELOPMENT – HOW THE PATENT SYSTEM WORKS IN PRACTICE

The above discussion sets forth the theoretical rationale for the patent system. However, the test of theory is how it works in practice. A practical description of how patents stimulate economic development could be the subject of a multi-volume treatise. This section will provide some facts and examples of how this process occurs in everyday business and policy contexts, especially focussing on

- (1) how patents facilitate technology transfer and FDI;
- (2) patents as stimulants of R&D at universities and research centers;
- (3) patents as catalysts of new technologies and new businesses;
and
- (4) how businesses, especially small and medium-sized enterprises (SMEs), accumulate IP assets and engage in transactions based on such assets.

Finally, we will conclude by discussing how developing nations can use patents strategically to take full advantages of these dynamic business processes.

PATENTS FACILITATE TECHNOLOGY TRANSFER AND INVESTMENT

A robust patent system and appropriate enforcement are prerequisites for technology transfer and investment. Without patent protection, no business is comfortable in disclosing its technologies or investing in R&D. Thus, the most fundamental way that patents facilitate technology transfer and investment is the creation of a safe environment in which business and further R&D may be conducted. With such investment and business relations, given the proper structuring of and favorable terms in joint venture agreements, a rich harvest of technology transfer in the form of know-how and human capital development can be reaped. We witnessed some experiences of emerging economies in the last century.

At the launch of the Kennedy Round of GATT negotiations, the President of the United States of America, John F. Kennedy, referred to Japan as a developing country; however, we have only to look at Japan today to see the change. Japanese policy-makers relied on the patent system as a crucial tool in developing the national economy and this assisted it in promoting FDI and transfer of technology during the transitional period from a developing to a developed country (see Box - 4.3).

The Republic of Korea has also embraced the patent system and the cycle of creation theory. Over the last decade, it has overtaken Germany and the United Kingdom in the number of overseas information technology (IT) patents granted in the United States of America. The Republic of Korea had 30 times more patents in the period between 1986 and 1996 than in the previous decade.

BOX-4.3 SONY AND WESTERN ELECTRIC

From its humble beginnings in 1946 as a small enterprise of some 20 staff members repairing phonographs, a brave decision to obtain a patent license changed the fate of Sony Corporation. In 1952, while travelling in the United States, Mr. Ibuka, the founder, came across patent information on an invention of Bell Laboratories: the transistor. He asked a stockbroker working at an American branch of a Japanese trading company to approach Western Electric (WE), the patent-holder. At that time, the transistor was only used in hearing aids, and WE did not see any chance for greater commercial success in the application of transistor technology. Ibuka thought, "there is not much potential in hearing aids, let's make a new transistor and build radios." Due to the scarcity of the Japanese foreign reserves at that time, the transfer of foreign technologies needed the government's approval. Ibuka successfully convinced the Ministry of International Trade and Industry to permit the acquisition of a patent license from WE, as the existence of a patent implied the importance of the technology. Ibuka put together US\$25,000 for a patent license, and became one of the first licensees. WE wondered if such a small firm was capable of developing any useful device from the transistor. However, it shared useful technical information about the transistor with a Sony engineer, as

agreed in the patent license agreement. In 1955, Ibuka's engineers produced Sony's first transistor radio. The new product was a huge success in Japan, and this prompted Sony to catch up with other large competitors.

Source: Morita, Made in Japan, (1985) and Sony Public Relations Division, Sony's Autobiography (2001)

Brazil and India, both of which embraced IP and strengthened their patent laws in the early 1990s, witnessed a significant and continuing growth in FDI and in the number of patent applications filed within the countries in the latter half of the 1990s.⁴ In some other developing countries the rate of patenting has also increased sharply in recent years.⁵ In some of these countries, the process of modernizing the patent regime began as early as the 1980s, long before the conclusion of the TRIPS Agreement. The policy shift triggering the modernization of the patent system in many of them had been driven by the fact that they relied on export-led growth and were convinced that a strong system for patent protection was critical in stimulating innovation in local industries.⁶

CATALYST OF TECHNOLOGY TRANSFER

As proven in many examples (see Boxes 4.3 and 4.5), patents provide a rich source of technical and business information, which can be used to analyse the most up to date technologies and to find business partners and licensors. The role of the patent system in providing valuable information has been underestimated in the context of promoting FDI and transfer of technology. However, the Internet opened a new window of opportunity to look at strategic and wise use of patent information in this century.

How rich and new is patent information? There are over 30 million patents in the world today, and each year an average of 1 million new patent documents are filed and published. Published patents are public documents. In most countries, patent applications are published 18

months after the filing date. This allows for early disclosure of the technical and business information contained in these documents. Many countries accumulate and categorize patent information in patent databases that are searchable and published and updated on the Internet. Anyone with an Internet connection can browse through files of patent information organized by classification and generally searchable by key words and other fields. Some of the countries that maintain such public on-line databases are Australia, Brazil, Canada, France, Germany, Hungary, Japan, New Zealand, Poland, Republic of Korea, Romania, the Russian Federation, Singapore, Spain, Thailand, the United Kingdom, and the United States of America.⁷ Collective and regional databases are also a rich source of on-line information, including those published on the Internet by WIPO and some patent offices.⁸ WIPO's website maintains a list of all of these databases with direct links to their Internet sites.⁹

Commercial services operating on the web also offer, sometimes for a fee, patent databases that are easily searchable. These databases, because they are often used for prior art searches to determine the novelty of an invention, often include journals and scientific publications, in addition to patents and patent applications. One such service provided by Delphion Inc. a business that IBM spun off in 1997, claims that it has access to over 100 million data records in 600 databases and 15,000 journals.¹⁰ Some services are operated by quasi- public entities, such as Singapore's popular SurfIP web site, which is the result of the privatization of certain of Singapore's IP operations. Such services, whether private or quasi- public, are often an excellent resource for patent information from sources worldwide. As discussed later in this Chapter, other private companies originated from government agencies. For example, a UK company named BTG, which manages items of IP and attempts to turn them into commercial propositions, solicits patents to exploit. Its premise is that "many corporate research departments make interesting discoveries that remain undeveloped because of a lack of resources or a belief that the work is outside the company's remit."¹¹

At a macro-economic level, the statistical data derived from patent documents are important indicators of technological activity within sectors, companies, and countries and, as such, are very useful tools for policy-makers at all levels, particularly for those involved in industrial develop-

ment and corporate planning. They play an important role in monitoring technological progress, forecasting industrial developments, identifying market demand, and in evaluating investment and policy decisions.

At the level of the individual enterprise, review of patent databases is a useful way to gain technical and business information (see Box - 4.4). In terms of technical information, a scientist or businessperson can gain valuable insights into the state of the art in any particular field by reviewing patent documents. The databases are generally easy to use, and anyone with an Internet connection and a base level of competence in the technical field being searched can profitably search for information in them. Also, the up-to-date information contained in patent disclosures can help businesses avoid investment mistakes in terms of duplicating research that has already been done. Insufficient use of patent information causes considerable waste of R&D investment. For example, the EPO estimates that European industry is losing US\$ 20 billion every year due to a lack of patent information, which results in duplication of effort such as re-inventing existing inventions, re-solving problems that have already been solved, and re-developing products that already are on the market. In some cases, it is possible to use patent information to develop new products or processes, and this is an important and legitimate use of the patent system, as long as the new product does not infringe the claims of the patent.

BOX-4.4 WHY USE PATENT INFORMATION? IP AUSTRALIA'S ADVICE

- Don't reinvent the wheel. Searching worldwide patent information can help you avoid wasting time and money duplicating work done elsewhere.
- Look for technology that is available for licensing or is in the public domain because it was not patented in Australia or patent protection has expired.
- Monitor your competitor's research activities. Technical information about your competitors' products or processes might be published in a patent specification years before they appear on the market.

- Keep an eye on trends in technology and emerging key players.
- Avoid infringing someone else's patent. Searching Australian patent information before setting up to manufacture or import a product can help you avoid costly legal disputes.

Source: IP Australia

PATENT INFORMATION TRIGGERING PATENT LICENSING

Use of patent information for strategic business advantage may be even more effective than use for technical content. Patent information is used to observe market trends and develop data on competitors. Savvy businesses are able to assess the technical and product focus of their competitors by observing their filed applications and issued patents. Market information on technology trends and what R&D investment decisions companies are making can be gleaned from these documents. Names of individual inventors are often important information for competitors who wish to attract and hire talent. As discussed in Chapter 3, patents have become an important element in merger and acquisition due diligence investigations, and databases are often used to assist in assessing the value of the patent assets of an investment or acquisition target.

One of the most important uses of patent databases is prospecting for potential business partnerships and licensing opportunities. Searching databases according to patent classifications is a good way to identify other businesses engaged in a particular field—whether the searching company is looking to “license in” (a technology belonging to someone else that it wishes to distribute or improve), “license out” (a technology it has developed but perhaps does not have the resources to commercialize), create a “joint venture” (combine R&D efforts to create, manufacture, or distribute technologies and products), to invest, or to attract investors business seeking licensees, partners, buyers, or investors in a specialized field can search patent databases to find firms that are complementary to its business.

Using patent databases to license in technology can be a productive exercise. In some cases, business persons can locate dormant technology that has not found a licensee or manufacturer to commercialize it. Although it is important to examine carefully why the technology is not being exploited, in some cases, a license for a technology that is not being fully exploited can be an excellent business opportunity. The opportunity may be to exploit the technology in a different geographic market, modify the technology, or use it for a different purpose (see Box - 4.3 above about how Sony got started). From the licensor's point of view, licensing a good technology that it is not currently exploited in a geographic market is a good way to gain revenues it would not otherwise have.

Similarly, a licensor may find it very appealing if the licensee has skilled employees who manufacture products based on the technology, or can modify the technology or make it function in a different way. Such modifications are called improvements, enhancements, or derivative works; the licensee can offer to cross-license such improvements to the licensor as a way to add value to the deal and reduce its royalties. Businesses that have employees who are skilled will have a special advantage in such negotiations, but it is also possible to bring in third parties, such as universities or research centers, to add extra value to a joint venture. These opportunities can be a "win-win" for all parties, and one of the most direct ways to find out about potential partners is through patent databases. A patent in a key field is a statement that the company has made a significant investment in an area and will be interested in reasonable proposals to increase the return on that investment.

Patent databases may be used to facilitate licensing out of a technology or product. Inventors in the developing world can use such resources to find potential licensees or investors for their locally developed technologies. Often the existence of a filed patent will provide the credibility and visibility that permits a developing country company to attract an investor or licensee (see Box - 4.5 on azithromycin).

Patent databases may also be used to find technologies that are not patented in the country in which the searcher conducts his business. There is nothing to prevent a company from using patented inventions

in countries in which the inventor did not bother to get a patent, as long as there is no plan to make, sell, or use products in the country that granted the patent, or to import the products into that country or use products in the country or countries that granted the patent, or to import the products there. However, even if the searching company is legally free to practice the invention, full advantage of the invention may require the use of the patent holder's know-how, documentation, training, trademarks, related patents, and other advantages. Thus, the searching company may wish to enter into a business relationship with the patent owner in order to reap these benefits as well, even though a patent license is not legally required.

BOX-4.5 AZITHROMYCIN: ONE OF THE WORLD'S BEST-SELLING ANTIBIOTIC

The dormant market potential in a new drug led to Pfizer's entering into a mutually beneficial licensing agreement with the Croatian patent-holding company Pliva. Nigel Keegan, an analyst at the Daiwa Institute of Research Europe in London, estimated that royalties and the margin on bulk azithromycin sales to Pfizer accounted for more than 75 percent of operating profit for Pliva in 1999. Pliva, the most profitable company in Croatia and the largest pharmaceutical company in Central Europe, is widely considered to be Central Europe's first home-grown multinational. The company was listed on the London Stock Exchange in 1996. Given its impressive success, many would find it hard to imagine that Pliva was once a struggling entity. All that changed, and the fortunes of this company witnessed a dramatic turnaround following its discovery of azithromycin. Today, azithromycin is the world's best-selling antibiotic. Patented by Pliva in 1980, the drug was subsequently licensed to Pfizer, which markets it as Zithromax™. Sales of Zithromax™ exceeded US\$1 billion last year and are expected to grow. The phenomenal revenues derived from the licensing agreement have facilitated Pliva's rapid expansion across Croatia, Poland and Russia. Remarkably enough, all this came about only because Pfizer's scientists happened to stumble upon Pliva's patent in 1981 while searching through patent documents at the USPTO.

IP OFFICE'S ROLE IN PROMOTING THE USE OF PATENT DATABASES FOR TRANSFER OF TECHNOLOGY

With escalating R&D costs, rapid technological change, and shrinking product cycles, the idea that technology could be acquired or licensed rather than reinvented is increasingly pursued. This patent mining usually works best when the company locates technologies complementary or related to its core business. In that case, the searching company may be in an excellent position to evaluate the patent, develop it and market it in ways that the owner has not been able to. Owners are often willing to license or assign patents for a number of reasons. As discussed above, the geographic or segment market may not be attractive to the owner. In some cases, the owner may have developed an invention, only to find that the invention does not fit into the current business plan of the company. In other cases, the owner may have exploited the invention but no longer does so because new inventions or product approaches have supplanted the older invention. A survey reported that 67 percent of US companies own technology assets that they fail to exploit (assessed at between US\$115 billion to US\$1 trillion). It estimates that about US\$100 billion is tied up in such idle innovation within the IP portfolios of big companies.¹² Rather than let the invention accumulate the expense of its maintenance, the company may put it up for sale or license. Maintenance of patents that are not being practiced can be expensive, and the average "effective life" of a patent before abandonment is 5 years. Only 37 percent of patents are maintained until the end of their term.¹³

As a reflection of the expanding role of patent offices in a knowledge-based economy, some patent offices, such as the Intellectual Property Office (IPO) of Singapore, are assisting local industry and research institutions by providing ancillary services that include the identification of strategic technology areas, technology and market studies, patent mapping and searches, IP management, technology and product roadmaps, as well as technology and market assessments.¹⁴ IPOs now have an additional role: to act as technology information centers.

PATENTS AS STIMULANTS OF R&D

Policy-makers have been encouraged by economists' findings that a country's economic growth rate is influenced by government IP policies (see Chapter 2). Recent recognition of the importance inherent in the "endogenous growth theory" (that economic policy and external factors can drive economic growth) suggests that governments should give a higher priority to policies that promote research and engineering activities and that create a solid basis for indigenous technologies, as opposed to imported technologies. In short, the hopeful aspect of this theory of economic growth is that policy-makers can make a difference to economic development by using the tools available to them, including patent policy.

In past decades, many developing countries realized that the transfer of technology from other countries has a negligible impact on the creation of a base for the development of the so-called knowledge industry, *unless* the transfer is followed up by a mechanism that empowers local researchers, engineers, entrepreneurs, and other innovators to use the transfer as a spring board for the creation of new knowledge. It is not enough for developing countries to invite in foreign technology businesses for investment and manufacturing; the transfer of technology from such ventures alone may be small. The benefit from technology transfer, in other words, is not automatic. Effective transfer of technology is an ongoing process that must include active local participation.

How does intellectual property start the process? Part of the answer may be found in the development of products and technologies in the country itself ("indigenous development"), and one way this occurs, particularly in developing countries, is in the transfer of technology from universities and public research institutes to the private sector in the form of intellectual property. In many countries, particularly developing countries, it is the public research facilities and academia that provide the primary sources of knowledge. Basic and applied research is often conducted in government-funded and faculty-led research projects in chemistry, medicine, engineering, physics and other scientific and technical

disciplines. It is vital for policy-makers to establish a framework in which intellectual property encourages those research institutions to transfer and exploit knowledge, by bringing together the public and academic efforts with those of the commercial sector.

SUPPORTING UNIVERSITIES AS CENTERS OF INNOVATION

Throughout history and in all nations, students and professors at schools, universities and research centers have been at the heart of national cultural, scientific and intellectual activity. Vital and growing societies support these individuals and institutions and are rewarded with culture, critical thought, scientific advancement, human capital development, and the development of new and useful technical methods and systems.

The primary business of universities is teaching and research, but to the extent that the rich intellectual activity at universities and research centers is also applied to the solution of practical problems, this supports and feeds the cycle of creation and economic development described earlier in this Chapter. In developing nations, the relationship between such university-based research and national economic development is particularly important because of the dearth of resources for R&D in commercial sectors, as well as the relative absence of foreign investment in the technology sector.

PUBLIC SECTOR R&D IN THE DEVELOPING WORLD

In developing countries, research programs are mainly funded by the public sector or universities (most of them are public), but this funding is often inadequate and the percentage of global R&D expenditure in developing countries continues to decline,¹⁵ stemming mainly from the lack of available public resources¹⁶. Currently, it is estimated that 96 percent of such expenditure occurs in developed countries. Significant inward investments are required for research efforts to intensify and a

promising approach to enhance this is through FDI and partnerships with the private sector, which are demonstrably encouraged through, *inter alia*, strengthening IP laws.¹⁷ Therefore, as public sector R&D efforts decrease, stronger IP rights are required to increase private funding in this area, or to increase income from commercially successful products and services using the research results, for further R&D investment.

Basic research entails longer time frames, which is why it usually has to be supported by the public sector and why it fails to develop in places where it does not benefit from such support. Moreover, public sector support for longer term R&D activities is likely to become increasingly important, particularly as shrinking product life cycles are forcing companies to adopt an increasingly short-term view in the structuring of their research activities.

It is a painful waste to see the large amount of scientific and technological advancements in universities and public research institutes go unused, with some seen only as academic achievements, particularly when a significant amount of public funding has been spent on supporting that research. What is wrong? The problem is mainly that research efforts are not linked to the commercial application of the research results. Commercial success depends largely on follow-on action taken by business and industry. Without the integral involvement of the commercial sector, little profit can be returned to research institutions. This creates a waste of research funds and a systematic, vicious circle of diminishing returns. Government policies should encourage collaboration and cooperation between academia, research institutions and industry, through licensing and other forms of technology transfer, joint research activities, and the sharing of expertise.

FROM “R” TO “D”

To increase the contribution of public sector research and university research to industrial and economic development, national policy-makers need to work towards bringing business and academia closer together. Technology transfer from universities to industry would be greatly facilitated if universities were to patent and license the results of their

publicly-funded research to industry. Such patent licensing by universities provides both an incentive and a sound basis for private companies to undertake the risky investments associated with moving cutting edge technologies, with unproven market potential, from projects in the laboratory to products in the market place. In terms of leveraging public sector funds, the subsequent investments which will be made by the private sector company in developing the technology are significant, as it is typical for a company to invest between 50 to 100 times more than the initial licensing fee paid to the university to develop the technology. With rapid technological changes and shortened product life cycles, companies are increasingly looking towards universities for new technologies to be used in the rapid development of new products.

One may argue that results derived from publicly-funded projects undertaken by the public sector or universities should be exploited by the public sector instead of the private sector. However, the reality is that without the strong incentives of private ownership and commercial interests, few make vigorous efforts to commercialize new inventions. Also, these options are not mutually exclusive; both avenues may be pursued and private sector participation may be more effective in some contexts than in others. The real question is whether the university and public sector receive adequate compensation in the form of royalties or other payments in consideration for the license or transfer. Such licenses and transfers are not "give aways" but generally involve significant revenue flows to the research institution.¹⁸ Thus, in some countries, laws have been enacted to facilitate the transfer of technology from universities and the public institute, to the private sector, by allowing the universities and public institutes to obtain patents, and to grant exclusive or non-exclusive licenses to private firms with an interest in the commercialization of the patented technology.

For example, in the United States the Bayh-Dole Act of 1980 was formulated as a result of a study and debate concerning the patent policy of the US government in the 1960s and 1970s. At that time, there was no government-wide policy regarding the ownership of inventions made using federal funding. The Act had two purposes: (1) to allow universities, non-profit corporations, and small businesses to patent and commercialize their federally funded inventions; and (2) to allow federal agencies

to grant licenses for their technology to provide more incentives to businesses. Before the adoption of this Act, the US government's policies were more restrictive on licensing; indeed there appeared to be a reluctance to grant licenses to commercial companies. In fact, at that time, licensing activities for government-owned patents (5 percent) were much lower than those for patents owned by the private sector (30 percent). The Act reinforced the link between universities and industry in utilizing research results. The data included in Table - 4.6 clearly shows that the Act promoted a substantial increase in technology transfer between universities and industry.

TABLE-4.6 TECHNOLOGY TRANSFER FROM US UNIVERSITIES TO INDUSTRY AND THE IMPACT OF THE BAYH-DOLE ACT OF 1980¹⁹

Data/year	1980	1986	1992	1996
Total number of patents issued to the universities	200 (20 universities)	NA	1,557 (139 universities)	1,776 (131 universities)
Total number of licenses granted by the universities	96 (1974-84 average)	NA	755	2,209
Total income from the grant of licenses	NA	US\$30 million (1986 data of 112 universities)	US\$57 million (1989-90 average)	US\$365 million

The United States of America, which has traditionally supported private sector initiatives, managed to bring academia into the market mechanism with special legislative efforts. By contrast, we see how difficult it is for countries in transition to market-oriented economies to provide commercial incentives to researchers and professors in the public sector.

China enacted its first patent law in 1984,²⁰ increasing awareness among researchers and university professors of the relevance of technology transfer. In 1999, a new Act was introduced concerning the creation of new technologies, the development of high technology and its industrial application. The Act allowed universities to establish science and tech-

nology research centers, and to encourage professors and researchers at the universities to join industrial parks focused on technology and commercializing the results of scientific research. The Act was intended to provide a bridge between universities, research institutes and high-tech industries which are competitive in the market. The Act also provided that remuneration would be awarded to any person who contributed to the transfer to the private sector of technology developed by universities by allowing universities to use some of the revenue derived from the transfer for that purpose. The Act established that universities should also strengthen the management of intellectual property and should provide remuneration to those employees who create inventions, and to other researchers, and has already provided a significant incentive to transfer technology associated with the inventions owned by universities.

EXCLUSIVE OR OPEN; LICENSING POLICIES AND COMMERCIALIZATION

Research results achieved by the academic field generally need further adaptation and development in order to meet market demands. In some cases, the economics of the development and market environment may mean that the private sector licensee will require exclusive rights to commercialize the invention. This may be because the licensee will have to invest in the development of the invention into a product at a level that makes profit unrealizable if the licensee has to compete with other licensees who do not need to make the same investment but can simply piggyback on the work of the original licensee. Other factors related to market competition may make it difficult for the licensee to realize a return on the investment made in the license. Whether an exclusive license is needed in order to make the license worthwhile for the licensee depends on the facts in each situation. In the negotiation of the license, the potential licensee generally attempts to persuade the licensor of the need for an exclusive license by putting forward various factual arguments.

For example, in some cases, the lack of exclusive rights will discourage a licensee in the private sector from pursuing the adaptation and improvement of the subject technology. This may actually hurt the interests of the licensor institution, as it will be less likely to receive lucrative royalties if the technology is not optimized or is not successful. In fact, certain governments have recently reviewed their licensing policies concerning the technology resulting from publicly-funded projects. For example, Germany recently revised its rules on the ownership of IP that has been created as a result of government funding. The private sector can now obtain full ownership of a patent, as the old rules (50 percent share only) did not sufficiently encourage firms to take a risk in commercializing inventions.²¹

In other cases, a licensor may decide that non-exclusive licenses actually promote their interests better than exclusive licenses, because they permit broad dissemination of a technology. This strategy may well result in creating the possibility of a platform, *de facto* standard or fundamental technology that will ultimately return more revenue and generate more new technologies because of its broader reach.

In cases where the technology is a fundamental one or one that involves public and academic interests, a patent owner's voluntary and non-exclusive licenses granted to interested parties may be sufficient for commercial exploitation. The United States Bayh-Dole Act includes certain provisions protecting the public interest (known as "march-in" rights), which call for mandatory licensing under certain conditions if the patent owner declines to voluntarily license the patented technology, that has been developed by a public-funding project and where licensing to third parties is considered to be in the public interest. One such example is a patent on the gene-splicing technique (see Box - 4.7). Another groundbreaking tool in biotechnology, the use of stem cells for research, prompted discussions on the licensing policy to be adopted, since it was patented by a non-profit foundation of the University of Wisconsin. As a US government official put it, "[t]he issuance of patents on these new discoveries may not necessarily have an adverse effect on continuing research, provided that the patent owners devise a licensing strategy that will allow basic research to continue unencumbered while preserving commercial value."²²

BOX-4.7 THE KEY PATENT IN GENETIC ENGINEERING

The most famous example of the application of the Bayh-Dole Act to date may be the technique for recombinant DNA for which the USPTO issued patents in 1980 to Professors Cohen and Boyer of Stanford University and the University of California, respectively. Although the invention was broadly patented, Stanford's Office of Technology Licensing (OTL) established a very modest non-exclusive licensing program for commercial institutions, and it allowed researchers at other academic institutions to use the invention for free. The OTL granted more than 300 licenses and received an income of hundreds of millions of dollars. The licensed technique turned out to be one of the essential tools of the biotech industry, which continued to grow and prosper until it has become the powerhouse it is today.

Source: Remarks of Robert Stoll, Administrator for External Affairs, USPTO, to the First Annual CIPR Conference on June 28, 2000 and the National Research Administrator's Resources Network, "University Technology Transfer" at <http://infoserv.rtttonet.psu.edu>

UNIVERSITIES AND RESEARCH INSTITUTIONS DEVELOP LICENSING EXPERTISE

To facilitate technology transfer and licensing negotiations regarding their inventions, public research institutes and universities require experts in technology licensing who have negotiation skills and knowledge of both technology and IP and who, ideally, are staff members. Various business models for obtaining such expertise exist, depending on different strategies and cultural backgrounds. In some countries, the national patent office provides the universities and research institutions with the necessary services, taking advantage of the expertise of its own staff. In other countries, semi-governmental or non-profit organizations have been established under the guidance of the government, some of which have become privatized. Other countries have enacted laws, and encouraged universities and research institutes to establish their own technology licensing offices (TLOs) in accordance with requirements for

patent licensing activities and, in some cases, for receiving government funds. The following section will discuss these different models in detail.

In the United States of America, to implement the Bayh-Dole Act effectively, a number of TLOs were established at universities. As a result, the membership of the Association of University Technology Managers (AUTM) increased from 113 in 1980, to 2,178 in 1999.²³ Growing numbers of universities and TLOs established within them have demonstrated that encouraging and facilitating technology transfer in relation to inventions, as a result of federally funded research, has been effective in serving as a bridge between the academic community and the private sector.

To undertake publicly-funded national projects in the 1970s and 1980s, the Japanese government set up several consortia consisting of government research institutes and selected private firms. However, the public funding dried up, and the commercialization of the results of the basic research was not always easily achievable due to the different interests of the participating firms. Encouraged by the success of the Bayh-Dole Act, in 1998, the Japanese Government enacted the Technology Licensing Office Law. The law provided for certain conditions for TLOs, which could then receive financial assistance from the government to help with their administrative cost, and thereby encourage technology transfer contracts between universities and the private sector. Since the enactment of the law, a total of 10 TLOs have been established as of October 2000. TLOs are authorized to receive assistance from the government, including financial assistance of up to US\$300,000, for work contributing to technology transfer and in the form of waivers of patent application fees payable by their TLOs for filing patent applications. Universities in Japan have been encouraged to establish general IP principles and rules concerning inventions created in the universities, in order to provide incentives to inventors. As an example, the proportion of benefit-sharing at Keio University provides that an inventor will receive 80 percent of the revenue coming from the commercialization of inventions if the total revenue is under one million Yen (US\$90,000) per year. The private sector considered the TLO mechanism useful, mainly for two reasons: (1) effective search and finding of useful inventions developed by universities and (2) ease of contact with universities through a single contact point at the TLO.²⁴

Indonesia has recently taken bold steps to create IP management offices at universities and research centers all over the country. Twenty centers for IP management have been set up to offer IP licensing expertise, IP rights management, counseling, patent searching and other functions to promote “knowledge based national economic development through encouraging inventive culture, protecting and selling intellectual property works which have been invented both inside and outside ITB [Institut Teknologi Bandung]...”²⁵ Efforts like these are likely to put Indonesia in the forefront as one of the new technology and economic stars in Asia.

UNIVERSITIES AND PATENT LICENSING: THE BEST MATCH FOR KNOWLEDGE CREATION

An increasing number of universities are becoming entrepreneurial. For instance, Oxford University in the United Kingdom and 27 of its colleges have recently set up a £10.7 million (US\$25 million) venture capital fund to invest in spin-offs from university research. The Isis College Fund invests in companies that convert university research into commercial assets. In 1988, the University set up a special unit, Isis Innovation, to assist in transferring technology from laboratories to commercial use through patents, licensing, and specific-purpose companies. The University has already invested in 18 companies, at least 5 of which are now publicly listed.²⁶

In 1995, Stanford University in the United States of America, set up its Office of Technology Transfer. It was originally a one-person pilot program, generating US\$55,000 from a mere three technologies. It has blossomed into a full-fledged, 20-person office, managing more than 1,100 active inventions licensed to companies all over the world – 220 of which were producing royalty income totaling US\$44 million.²⁷ In 1999-2000 alone, Stanford realized \$36.9 million in gross royalty revenues, even though this was the first year that the famous Cohen-Boyer DNA patents (see Box - 4.7) no longer paid royalties.²⁸

The growth in university licensing of dramatic new technologies is rapid. Licensing of optical mirror technology developed at the Massachusetts Institute of Technology, stem cell licensing at the University of Wisconsin,

both in the United States of America, and optical fiber technology from the UK's University of Bath, all provide illustrations of famous research institutions that have agreed to permit commercialization of research discoveries.²⁹

The inclusion of patent protection and licensing provisions concerning inventions made by researchers at universities and public institutes in the regulations of these universities, is of paramount importance to maximize the potential of those knowledge organizations. Such a scheme helps to provide financial returns from successful licensing and creates incentives for researchers who otherwise might not find any interest in looking into the possibility of the commercialization of their results.

Unfortunately, until quite recently, it was considered inappropriate, in many academic circles to patent the results of academic research. This has led to the waste of some of the most valuable knowledge assets in many countries. TLOs could provide researchers with the necessary assistance to follow up the commercialization of their inventions. Policy-makers should understand that many steps and skills in administering patent licensing are needed to bridge the gap between academic research activities and the private sector. These steps and skills include analysis of the essence of the inventions, preparation and processing of strong patent applications, finding potential licensees, license negotiation, and evaluation of the value of inventions. The potential and actual returns from the licensing agreements would encourage universities and academic researchers to make such efforts, and would also provide additional income to expand their research.

PRIVATIZATION OF TECHNOLOGY TRANSFER AGENCIES

Some organizations originally established to assist technology transfer of publicly-funded research results have been privatized. This has served to expand their coverage of business and give greater flexibility for their activities. The National Research Development Corporation (NRDC) is such an example. Established by the UK government in 1948 to facilitate the commercialization of inventions deriving from publicly-funded research activities at universities and public research institutes through the use of

patent licensing, NRDC became the British Technology Group (BTG) in 1981. BTG's revenue depends in part on licensing fees and in part on the stocks of the venture businesses established as a result of innovation with which it is involved. BTG has developed the competence to include relevant technologies as a package, or patent portfolio, to sell as technology ready for commercialization. As an example, magnetic resonance imaging (MRI) is a technology combining inventions developed by Nottingham, Aberdeen, and Oxford universities. MRI, a very important medical breakthrough, has brought the organization some US\$150 million.³⁰

The Fraunhofer-Gesellschaft is another example. It was originally founded as a Bavarian institution in Munich in 1949, as part of a program to reorganize and expand Germany's research infrastructure. It has grown to become the largest organization in Germany for applied scientific research.³¹ It has a clear orientation toward industry's need for innovation. Its activities focus on fields of research where the results achieved are of direct benefit to its most important partners – small and medium-sized enterprises (SMEs). In 1952, the Ministry of Economic Affairs of the Federal Republic of Germany approved the role of the Fraunhofer-Gesellschaft as the third key support structure for German research, alongside the Deutsche Forschungsgemeinschaft (DFG) and the Max-Planck-Gesellschaft (MPG). In 1969, the Fraunhofer-Gesellschaft was included in the government's basic funding scheme and in 1973, a cabinet decision approved the idea of the so-called "Fraunhofer model," whereby state funding was to increase in proportion to the Fraunhofer-Gesellschaft's success in acquiring contract research work. That decision meant that R&D work had to be oriented strictly in accordance with the market, which serves to confirm that government decision-makers firmly intended to transform the Fraunhofer-Gesellschaft into the leading umbrella organization for applied research institutes. By 1978, the Fraunhofer program to promote contract research for SMEs had grown into a nationwide government program for SME support, enjoying major growth and high prestige. In 1999, 50 years after its founding, the Fraunhofer-Gesellschaft had 9,300 employees, working in 47 institutes

and generating about DM 1.4 billion (US\$640 million) in annual revenue. Since 1992, the Fraunhofer-Gesellschaft has been consistently the most successful applicant for patents among all state-financed research establishments in Germany (in 1999, for example, it was ranked 18th in Germany for the number of published patents effective in that country). Its Patent Center not only represents the Fraunhofer-Gesellschaft in all patent-related matters, but also acts as a partner to the research community and to industry. The Center's services include the evaluation of inventions, patent applications, licensing, technological consulting, strategic planning, and patent and technology assessment. The Center promotes inventions derived from research conducted at universities and other research establishments, and also by SMEs and individuals. It also promotes the commercialization of patented inventions by facilitating licensing agreements with industry. It advises companies in the planning and development of new products and serves as a broker for innovative technologies, using patent information.

Another similar example can be found in Israel. In 1949, the first president of Israel, Dr. Chaim Weizmann, a noted chemist, established the Weizmann Institute of Science as the first academic institution in Israel to create a technology transfer organization to promote the commercialization of its research. As an arm of the Institute to license its results, Yeda Research and Development Co., Ltd. was founded in 1959 as a private firm; it was charged with finding the right industrial partners to take the Institute's discoveries through the critical steps from the laboratory to the marketplace. Yeda operates by identifying and assessing research projects with commercial potential; patenting inventions and protecting various aspects of the intellectual property of the Institute and its scientists; attracting funding for projects in exchange for the rights to commercially exploit their results; and licensing inventions and technologies to industry. Today Yeda is one of the top patenting organizations in Israel. Between 1995 and 1999, it was granted 108 patents in the United States. These patents are licensed internationally, often in partnership with firms based in the nearby Kiryat Weizmann Industrial Park, Israel's first high-tech industrial park.³²

PATENTS SUPPORT NEW TECHNOLOGIES AND NEW BUSINESSES

Patents can promote economic development by providing valuable information, by stimulating R&D at universities and research centers, and by supporting those institutions and emerging technologies and businesses. This section explores how that occurs and provides some noteworthy examples of the interplay between patents, technology and emerging businesses.

Historically, patents were usually granted in relation to machines, apparatus, and tools (subsequently also to products) manufactured in a factory. With rapid technological developments and the increasing significance of knowledge in most sectors of industry, the objects of patentability have widened as a reflection of the technological innovation that is taking place. Today, patents are increasingly important, not only in heavy industry manufacturing, but also in relation to the soft industry and services sector. There has been a surge of technological innovation in all sectors of the global economy, but over the last quarter of a century, the most important innovations have been in the new fields of computer electronics, digital technology, genomics and biotechnology.

In the areas of computer technology and biotechnology, policy questions – such as the extent to which patent protection should be expanded (or limited) – were determined by considering various factors, including in particular the incentives needed for a pioneering industry in which high risks are taken. One solution found in many countries is the protection of certain types of intellectual creations (for example, the layout design of integrated circuits) by a system other than the patent system. Another solution is the patent system, with certain modifications to the interpretation of patent law or the extension of patentable subject matter (for example, computer-assisted electric appliances, business methods and human genomes).

These changes were not made swiftly in all countries, but were progressively adopted, and some of them still remain the subject of international discussions. Nevertheless, these cases tell us how the patent system has been more dynamically and frequently modified than in any previous

time in its history. These changes have been driven and influenced by the need for adequate protection of the new types of intellectual creations which the emerging technologies have generated. Policy leaders recognized that the existence of patent protection permits the development and commercialization of new technologies. Business methods using the Internet, and genomics, are two obvious challenges facing the patent system at the beginning of this century.

COMPUTER TECHNOLOGY IN ITS INFANCY NEEDED PATENT PROTECTION

Computers are central to the functioning of modern society, controlling everything from telecommunications to aviation. Our overwhelming dependence on computers, and their increasing integration into our everyday lives, were reflected by the extent of our concern that the “Y2K millennium bug” would cause disruption to almost every aspect of our lives.

In 1959, Jack S. Kilby made an epoch-making presentation of his monolithic integrated circuit, generally known as the microchip (see Box - 4.8). Later, the microchip became a more intelligent microprocessor, such as the Intel 286, leading to the wider use of microprocessors (or chips) in computers and other electronic products. The manufacturing methods to enhance the density of circuits on microprocessors were covered by patent protection, as were inventions related to the speed and functionality of the chips. However, the layout of the integrated circuit was protected by *sui generis* (special) law rather than the patent system, as it was generally accepted that the designing of a layout of a microprocessor did not involve inventive efforts, and thus many legislators considered that layout designs did not merit patent protection.

The focus of research efforts by the computer industry shifted towards software-related technology in the late 1980s as the performance of processors increased. Initially, software was construed as a creation outside patent protection. After worldwide discussions on the implication of patent rights on functional and indivisible designs, this view began to change. The economic momentum and significance of the software business, as a driver for the computer industry, and therefore for many

related industries, became evident. Today, with the advent of the Internet, another test for the patent system is the rise of business method inventions. The race between the development of computer technology, and policy-makers concerned with patent law and policy will be discussed in detail below.

BOX-4.8 KILBY'S MICROCHIP PATENT

Honored with the 2000 Nobel Prize for Physics, together with Zhores I. Alferov and Herbert Kroemer, Jack S. Kilby is considered one of the greatest electrical engineers of the twentieth century and will be remembered as an inventor of the microchip, for which US patent 3,138,743 was granted. Working as a researcher at Texas Instruments, Inc., Kilby produced 60 inventions related to the microchip, developed on the basis of the key 743 patent, which expanded the range of industrial applications and created a fundamental layer within the computer industry by the mid-1970s. The key patent and the other 60 patents not only provided Texas Instruments, Inc., with its early status as a leader in the then-emerging microchip market, but also contributed to intense R&D competition for the faster speed and smallest size inherent in today's information technology.

*Source: www.nobel.se/physics/laureates/2000/illpres/kilby.html
and www.ti.com/corp/docs/press/company/2000/c00017.shtml*

COMPUTER SOFTWARE BLOSSOMED UNDER IP PROTECTION

In the 1980s, there were extensive discussions on whether the patent system or the copyright system, or both, should provide protection for computer software. It had become clear that computer software, in order to develop and thrive, needed strong intellectual property protection. These discussions resulted in the generally accepted principle that computer software should be protected by copyright, whereas apparatuses using computer software or software-related inventions should be protected by patents. This legal development culminated in international

agreements (the TRIPs Agreement and the WCT) obligating signatories to legally protect software. The law relating to the patentability of software is still not harmonized internationally, as some countries embraced the patentability of computer software and others adopted approaches that recognize inventions assisted by computer software. Today, in many countries computer software and hardware may be protected by both copyright and patent law, depending on the nature of the IP at issue.

There was also a growing need at that time for the protection of the physical layout design of an integrated circuit, which is why a diplomatic conference on that subject was organized by WIPO in 1989. Given that patent protection is stronger than the protection afforded by other types of IP, including copyright protection, how different IP laws were used to protect various types of computer technology was an important policy decision. Along with the desire to protect new computer technologies, there was also the widely-shared concern that if the protection was too strong, it could discourage further developments of intellectual creation.

During the debate on patent and copyright protection, the competitiveness of the computer industry created a political climate more favorable to protecting certain software-related inventions by patents, rather than by copyright alone. Policy-makers were well aware that it was strategically advantageous to have patent protection for computer-related inventions in order to encourage the transfer of this emerging technology from countries advanced in this area. It was also important to protect computer-related inventions in order to stimulate investment within their own national industry.

The number of companies developing software continues to grow. Smaller software companies are filing for patents more often, particularly as venture capitalists frequently require patents as a condition for providing funding. Companies that have previously filed patent applications for software-related innovations have also stepped up their efforts to patent these innovations, including, in particular, companies with strong software portfolios.³³ Also, software increasingly underlies other technologies, such as the software that today is used to design, manufacture, and render operable the hardware in a microprocessor (e.g. "verilog"; a

hardware description language). This software also is protected by both copyright and patent law in many cases.

Today, the extent to which software-related inventions are patentable varies considerably from one country to another. There appears to be an acute need for international harmonization, particularly as international trade in software products continues to increase and companies competing on a global basis are interested in protecting their IP assets uniformly around the world. Also, the consequences of one country offering patent protection while others do not are that some nations will have a more sheltered environment for growth in that particular industry, and enterprises there will accumulate more patents (“patent assets”), while other nations and their enterprises will not build up patent assets in these areas. The practical significance of patent assets will be addressed later in this Chapter when we explore licensing as an important element in the strategic use of patents to stimulate development.

BUSINESS METHODS AND IP PROTECTION CORRESPOND TO INTERNET BUSINESS GROWTH

Another area where business growth has stimulated the expansion of IP protection, and where IP protection has in turn stimulated business growth, is the fast-growing field of electronic commerce on the Internet. Patents have recently been granted for so-called business-method inventions in this area. As most modern business models involve the application of computer software, the patentability of business methods in the United States is closely linked to recent developments in the law on the patentability of software and software-related inventions. The decision of the Court of Appeals of the Federal Circuit in 1998 in *State Street Bank & Trust v. Signature Financial Group* holding that business methods could be the subject matter of patents, triggered a sharp increase in such applications.³⁴ This seminal decision challenged traditional views of the “technical nature” of patents common in certain countries.

Since *State Street Bank*, patents have been issued on methods for on-line decision analysis, on-line financial systems, on-line customer rewards systems, and even systems for categorizing and valuing patents. Suddenly, the potential of patent protection seemed much broader and more accessible to a wider range of new ideas than had previously been contemplated. In fact, the growing quantity and complexity of business method applications reflect the increasing importance of business technologies in today's economy.

Business-method inventions which are applicable to e-commerce consist mainly of software-based systems and methods which are used to effect or simplify electronic transactions taking place over the Internet. These inventions enable the transaction to be effected by the computer system without requiring the relevant parties to be present in close proximity during the transaction. The majority of these patents have been issued in the United States of America. Patents for software-related business methods, such as those mentioned above, soared from 700 in 1996 to 2,600 in 1999. Some attracted significant public attention.³⁵ There is a raging debate on the long-term social and economic effects of Internet-related patents and the related issues of patentability, prior art, and broad patents.³⁶ Recently, several high-profile patent infringement suits involving Internet patents have added to the growing discussion.

For example, Amazon.com sued Barnesandnoble.com, claiming that the latter's ordering method infringed Amazon's "one-click" patent. Amazon won a preliminary injunction prohibiting its competitor from using one-click shopping methods. A lawsuit brought by Priceline.com against Microsoft claimed that the latter's Expedia.com travel site infringed Priceline's patent on "reverse-auction." Under a settlement Expedia will pay royalties to Priceline. Much appears to be at stake as litigation involving patent infringement suits continue to be filed in relation to Internet business methods.

In the evolving knowledge-based economy, innovative ideas are often a company's most valuable source of competitive advantage. This is especially so for companies engaged in online business, with limited tangible assets and whose success is mainly dependent on innovative ideas and other intangibles which can include business models. These patents are expected to increase in tandem with the continued expansion of the

Internet and electronic commerce.³⁷ According to the USPTO, prior to 1990, business-method patents were heavily focused on computerized postage metering and cash register systems. However, by 1994 these were overshadowed by financial transaction systems, and by 1999, electronic shopping and financial transaction systems became the two dominant categories. Newly filed applications indicate that advertising management systems will join the ranks of the most popular categories in this patent class. In 2000, 899 business-method patents were granted by the USPTO.

Some countries have moved to protect business-method inventions. For example, business-method inventions are now patentable in the Republic of Korea, following the introduction of Examination Guidelines for Business Methods on August 1, 2000. According to the Korean Intellectual Property Office (KIPO), it has already received 4,000 local applications for such patents, most of which are related to the Internet by clarifying or modifying their examination standards. Other countries are still holding discussions centered on the patentability of business methods which are applicable to the Internet and e-commerce. For example, the European Commission held a series of consultations in 2000 on whether and how business-method inventions should be protected by patent within the European Community and recently proposed the new policy for adoption by the European Union member states.³⁸ As discussed above, in the 1980s, the demarcation line was made between copyright protection of computer software, and patent protection of software-related inventions. The Internet has virtually erased that borderline, as many business methods are deemed more than mere computer software programs.

As in all other areas of technology, business-method patents are important to create incentives and encourage investment in new technologies (see Box - 4.9). However, some are concerned that the granting of overly broad patents, particularly those involving fundamental online business models, could stifle innovation and have a detrimental effect on the growth of e-commerce, particularly if these patents are abused.³⁹ Some have also expressed doubts as to whether some of these online business models fulfill the basic requirements for the granting of a patent; they contend that existing business models are being reinvented for use on the Internet.

Still others point out the intersection of business method patents and the digital divide: with parts of the world patenting business methods, while other parts are still catching up with the most basic computer hardware technology. The consequences of this aspect of the digital divide are that ownership of business methods in the global marketplace will be secured by businesses in the nations that have aggressively supported such patents, whereas businesses from countries that are not so enamored of business methods, or that have not yet addressed the issue, will be left behind. This gap is not as significant when markets are merely national, but in the international e-commerce marketplace of the Internet, businesses not holding IP assets in this area will be at risk of infringement. If policy-makers are not concerned about the lack of skilled human resources to develop the e-commerce industry, software programmers may wish to seek more attractive job opportunities in foreign countries where technological developments in this area are more dynamic than others for various reasons, including stronger protection of intellectual creation. This may lead to a "brain drain" which in turn exacerbates the digital divide. As the coverage and impact of business-method patents are global, the need for international cooperation to find the best solution is acute.

BOX-4.9 THE IDEA FACTORY

The Walker Digital Corporation was founded in 1994 by Internet entrepreneur Jay Walker. The company develops and patents innovative information-based solutions for businesses and is modeled after Thomas Edison's famed Menlo Park invention factory. Walker Digital has at least 12 patents on business methods. Mr. Walker, chairman of Walker Digital and founder and vice chairman of Priceline, said that "[w]ith recent US Patent and Trademark Office and court affirmations regarding the patentability of business methods, a company now has the ability to protect not only its business products but the actual methods employed in bringing them to market and satisfying customers. This important new recognition of patent protection creates the incentive for exciting and significant innovation in US businesses, and will play a central role in enabling a new generation of businesses to emerge and flourish, both on the Internet and off." Priceline.com is based, in part, on a patent issued to Walker Digital for an innovative

software-enabled business process that allows interested buyers to communicate a binding offer to potential sellers, the so-called “name-your-price reverse auction” business model. Walker Digital received 7.5 million Priceline shares in exchange for the assignment of patent rights and a US\$500,000 investment. “Patents are a critical element of priceline.com’s business strategy as they strengthen and expand our competitive position,” said Rick Braddock, Priceline’s chairman and CEO. According to Mr. Braddock, “protected intellectual property enables us to establish and maintain our distinctive position in the e-commerce marketplace and gives the company the ability to focus on building its business and brand, and not be as concerned with the competitive copying going on in the e-commerce space. These patents also present priceline.com with the potential opportunity to open up new revenue streams through licensing.”

Source: Forbes Magazine, Walker Digital Corporation, and Priceline.com.

BIOTECHNOLOGY: THE TECHNOLOGY OF THE FUTURE

It appears that one of the next major waves of technological innovation will arise from the life sciences and biotechnology. With the sequencing of the human genome and advances made in plant and animal genetics and other aspects of the life sciences, these technological breakthroughs provide the building blocks for what are likely to be major industries with tremendous implications for the world economy in this century. Not only will mankind benefit from revolutionary drugs, treatments, and techniques that can lengthen and improve the lives of people worldwide, but researchers in all countries will also have the opportunity to contribute to the advancement of scientific knowledge and the development of the global biotechnology industry. Already, scientists across the world are beginning to tap recent genetic discoveries to produce life-enhancing applications ranging from revolutionary drugs to improved agricultural methods. For example, the world market for seeds based on improvement of genetic plant resources by plant breeding is substantial. In Asia, by the mid-1970s, improvements using genetics had increased wheat production by US\$2 billion and rice production by US\$1.5 billion per year,

through the incorporation of dwarfism into both crops. A wild wheat plant from Turkey was used to introduce disease resistance to commercial wheat varieties worth US\$50 million annually to the United States of America alone. Many other such examples exist.⁴⁰

All these efforts are supported by IP systems, and plant variety protection provides stimulus for this business sector. However, it was pointed out that too strong patent protection may give rise to ethical and environmental disorder and be an obstacle to greater access to life-saving essential drugs. Though the issues are beyond the scope of this book, it is worth restating that policy-makers and legislators should continually review the patent system in accordance with technological advances as well as social, ethical, and environmental issues in an attempt to strike an equitable balance between the interests of patent owners and the public.⁴¹ The Ministerial Declaration on the TRIPS Agreement also attempted to find the balance by confirming various flexibilities that the TRIPS Agreement gives to governments to deal with health problems.

The relevance of intellectual property to conservation, management, sustainable utilization, and benefit-sharing in respect of genetic resources and traditional knowledge has been accentuated by several recent developments: the globalization of markets and regulation, rapid advances in new technology (biotechnology and information technology), and the growing value of intellectual commodities as central assets in a knowledge-based society (see Chapter 7). The following sections will discuss the reinforced role of the patent system in biotechnology, summarizing the developments in the last two decades and projecting a promising future.

HIGH RISK OF BIOTECHNOLOGY RESEARCH SUPPORTED BY PATENTS

The year 1980 marked the dawn of a new era for the patent system and biotechnology. In that year, the US Supreme Court decided in *Diamond v. Chakrabarty*⁴² that a bacterium which had been genetically engineered to break down crude oil was patentable, as was "anything under the sun that is made by man." This landmark decision paved the way for the

patentability of biotechnological inventions in the United States of America. Currently, the extent to which biotechnological inventions are patentable varies from one country to another.⁴³

Biotechnology and genetic engineering have contributed to research capability in developing new drugs. Investment in R&D has become the most critical part of business for the research-based pharmaceutical industry, as the costs of developing new drugs have significantly increased (see Box - 4.10). The existence of adequate patent protection significantly affects corporate decision-making. For example, US R&D investments in pharmaceuticals have more than doubled in Mexico, following the strengthening of patent legislation in 1991, while, in the Republic of Korea, local pharmaceutical companies have increased their share of the Korean pharmaceutical market with the introduction of patent protection for pharmaceuticals in the 1980s. According to a recent survey, leading German, Japanese and US chemical and pharmaceutical companies stated that the extent to which a country protected IP rights had a major influence on their decision as to whether or not to invest in R&D facilities in that country.⁴⁴

BOX-4.10 YOU CAN'T DISCOVER NEW DRUGS WITH A MAN AND A DOG

In 2001, GlaxoSmithKline and Pfizer Warner-Lambert, two of the industry's newly merged heavyweights, each spent some US\$4 billion on R&D. GlaxoSmithKline is interested in having enough scientific resources to exploit "the rapidly evolving technologies and advances in understanding the underlying causes of disease." "You cannot discover drugs with a man and a dog. It requires really big expenditure to pull together a lot of knowledge coming from different areas. There are some things we want to do today but can't, even with a £1.2 billion R&D budget," said Sir Richard Sykes, chairman of GlaxoSmithKline. Indeed, it is estimated that the average cost of developing and launching a new drug is US\$802 million.

Sources: *The Financial Times*, 6 April 2000; Tufts Center for the Study of Drug Development, 2002.

THE DEVELOPING WORLD IS PIONEERING CURES USING PATENTED TECHNOLOGY

As a result of the culmination of the efforts of scientists from across the world, the benefits and opportunities presented by scientific advances are open to researchers worldwide. Biotechnological research is increasingly a global effort, as is evident in the growth of biotechnology research centers around the world, including developing countries such as Brazil, China, Cuba, India, the Republic of Korea, and Singapore. These countries continue to make significant investments in developing their biotechnological capabilities, and in their policies to promote scientific and technological progress (see Box - 4.11). For example, President Jiang Zemin of China said, "The key is to develop China's science and technology, to provide momentum for economic growth and social progress," and "of utmost importance is the establishment and improvement of scientific ethics, respect and protection for intellectual property rights, and guiding scientific and technological research to benefit people all over the world."⁴⁵

BOX-4.11 CUBA: A LEADING EXPORTER OF BIOTECHNOLOGY

An agreement was recently signed between SmithKline Beecham and Cuba's Finlay Institute giving the Anglo-American pharmaceutical group worldwide rights to market a patented meningitis B vaccine developed by the Finlay Institute. The vaccine is believed to be the only effective vaccine against meningitis B, a disease which spreads mostly among children and has mortality rates of 7 to 19 percent. Though the disease is now virtually eliminated in Cuba, it still threatens populations in large parts of the world. Since a meningitis epidemic in the 1980s, the vaccine has been exported to Argentina, Brazil, and Colombia where it has proven to be both safe and effective in preventing outbreaks of meningitis. Sales of the vaccine have also helped Cuba repay its debts to these countries.

The vaccine is just one of many achievements in Cuba's little-known, yet highly advanced, biotechnology industry. Today, Cuba is a leading exporter of biotechnology products and with annual sales as high as

US\$290 million, the industry is one of the country's largest export earners. Cuba has international patents on 66 pharmaceuticals, produced by the Genetic Engineering and Biotechnology Institute, the Molecular Immunology Institute, the National Bio-Medical Institute, and the Finlay Institute.

Cuban scientists are also developing other products to fight cancer, cholera, typhoid fever, dengue fever, pneumococcus bacteria, and AIDS. Cuban scientists are also expanding biotechnological research into agriculture and industry, including a vaccine to protect cattle against disease-bearing ticks, genetically engineered pest resistant crops and industrial enzymes to lower energy consumption.

The success of the biotechnology industry in Cuba is mostly a result of substantial governmental investment in biotechnology facilities, research, and education. Cuba has 1.8 scientists and engineers for every 1,000 inhabitants, a high proportion even when compared to the industrialized countries, and 222 research centers, employing a total of 34,000 people.

Source: Reuters and Time magazine.

Countries such as India also have a proven track record in the development of new pharmaceuticals (see Box - 4.12). Many believe, and their numbers are growing, that increased patent protection for pharmaceutical products and processes will assist firms in developing countries to complete their transition from being copycats of bulk drugs to companies that own their own intellectual property.⁴⁶ As these companies move up the value chain, many of them have started to focus on the development of innovative medicines; already successfully evidenced by their growing IP assets.

BOX-4.12 DR REDDY'S SUCCESS IN INDIA

Dr. K. Anji Reddy's Group has rapidly expanded to become an international pharmaceutical company, providing high-quality and cost-effective pharmaceutical products to markets worldwide. Dr. Reddy's Research Foundation (DRF) was established in 1993 with the purpose of discovering new therapies. Since 1994, DRF has discovered and developed several new chemical entities in various areas. Three have been formulated and two have already been licensed to the Danish pharmaceutical company, Novo Nordisk, in a landmark agreement which earned DRF the distinction of being the first Indian company to license its discoveries to a foreign multinational.

The deal provided Novo Nordisk with an exclusive worldwide license (excluding India) to develop and market pharmaceutical products, based on compounds discovered and patented by DRF, in return for upfront milestone payments and royalties to DRF. The agreement covers compounds relating to the treatment of diabetes, obesity, and dyslipidemia. This includes DRF-2725, an antidiabetic molecule which is currently undergoing clinical trials and for which DRF has already received US\$8 million in milestone payments from Novo. The deal with Novo Nordisk was important because it is estimated that clinical trials account for 70 percent of the cost of bringing a new drug to market, and success is by no means guaranteed. DRF would also benefit from Novo Nordisk's ability to market the drug internationally, thus allowing it to expand its markets globally. Novo Nordisk also stands to gain from being able to access promising new compounds in a manner which is both time and cost efficient, as the initial research required in the discovery of a new molecule has already been completed. For these reasons, it is likely that such agreements would take center stage in the development and commercialization of new molecules that are discovered by companies in developing countries.

DRF attributes much of its success to patent protection. Dr. Reddy firmly believes that the economic success of companies and countries can be measured in terms of patent filings. By protecting its innovations through patents, DRF is able to market and license its new drugs

worldwide. A strong patent regime also facilitates its ongoing efforts to develop innovative new products and processes. DRF has filed patent applications in several countries for all its inventions, including 31 product patent applications in the United States, of which 17 have already been granted. One hundred and ten product and process patent applications have also been filed in India. Because patent protection is central to its activities, DRF has established an in-house intellectual property management group to oversee all international patent filings and matters relating to patent strategy.

Source: Dr Reddy's Research Foundation

PHARMACEUTICAL R&D IS ENHANCED BY GLOBAL IP-BASED JOINT VENTURES

The global nature of pharmaceutical and biotechnological research has resulted in the formation of partnerships between companies worldwide. It is increasingly common for firms to undertake R&D activities through joint ventures and various other forms of research collaborations. The need to share escalating R&D costs was one of the prime reasons for the recent spate of international mergers and consolidation in the pharmaceutical industry. It is estimated that R&D investments by the global pharmaceutical industry increased from US\$39 billion in 1998 to US\$43 billion in 1999, with biotechnology companies contributing a further US\$10 billion. The US National Institutes of Health funds US\$17 billion in research each year. Spending on R&D is growing more quickly in the United States of America than anywhere else in the world. It is estimated that it increased by 17 percent to US\$24 billion in 1999.

BOX-4.13 BIOBRÁS

Biobrás was set up as a small, independent laboratory within the Federal University of Minas Gerais, Brazil. Biobrás began its activities producing enzymes under a licensing agreement with the US-based New England Enzyme Center. In 1977, with the assistance of the Brazilian Ministry of Health, Biobrás negotiated a joint-venture agree-

ment with patent holders and pharmaceutical multinational Eli Lilly for the production of animal insulin and its commercialization in Brazil. Eli Lilly obtained 45 percent ownership of Biobrás and transferred its technology to the Brazilian research-oriented pharmaceutical company. As part of the cooperation agreement, personnel from Biobrás were trained by Eli Lilly in various aspects of R&D as well as administration and marketing. By the time the agreement with Eli Lilly ended six years later, Biobrás had become an important insulin manufacturer utilising state-of-the-art technology. The market for Biobrás insulin showed huge potential and the Brazilian firm soon began exporting its main product.

In the meantime, Biobrás also engaged in research activity which led, in recent years, to an important breakthrough. Biobrás has now become the fourth pharmaceutical company – and the only non-multinational – to have the capacity and the technology to produce human recombinant insulin. The technology was developed by Biobrás in collaboration with the University of Brasilia and was subsequently patented in Brazil, Canada, Europe and the United States of America. Obtaining the patent for human recombinant insulin has been a turning point for Biobrás. Whereas sales of its products have remained more or less constant in recent years, the value of its shares increased six-fold in five years. It is fair to presume that Biobrás's IP assets (in particular its patent for human recombinant insulin) are perceived by the financial markets as the foundation for future growth.

The success of Biobrás was largely due to patent licensing agreements with large pharmaceutical companies and subsequent efforts to build up its technological infrastructure and human resources to obtain the capacity to produce its own pioneering technology.

Source: <http://www.uol.com.br>; <http://www.biominas.org.br/home.html>; USPTO; and pharmalicensing.com.


Researchers in developing countries that lack funds and resources are increasingly looking into possibilities for entering into R&D joint ventures with established research institutions and corporations for the development

of their research capabilities (see Box - 4.13 and Box - 4.14). The area of tropical and other diseases which are prevalent in the developing world is of particular importance as research directed at cures for these diseases currently accounts for a very small fraction of global R&D investment. It is estimated that although more than US\$56 billion is spent annually on health research, less than 10 percent is directed toward diseases that afflict 90 percent of the world's population. Between 1975 and 1997, 1,223 new compounds were introduced on the market, but only 11 of these were aimed at tropical diseases.⁴⁷

The high costs associated with the development of new pharmaceutical products, and the prospect of inadequate financial returns, have caused many multinational companies to withdraw from R&D investments in this area. As a result, many developing countries are looking into developing cures for these diseases, some of which may be based on indigenous or traditional medicines, and are including private sector alliances. For these to materialize, it is essential that patent protection be guaranteed, for two reasons. First, no commercial entity would be willing to absorb the risks associated with the necessary investments in R&D without patent protection. Second, developing countries participating in joint ventures will likely independently or jointly own inventions arising from such joint ventures and will need to obtain patent protection in their own markets and possibly in foreign markets. Without patent protection, the developing nation participant in an international joint venture may create important inventions, but fail to develop them as IP assets so that they can be used in licensing transactions, bring financial return, and thus fund future R&D.

BOX 4-14 HOW BIOTECHNOLOGY IS RESHAPING SCIENCE IN SINGAPORE

The horseshoe crab is a living fossil. It has survived for 400 million years and can be found in some of the murkiest waters. Its survival hinges on the strong antitoxins contained in its blood which protect it from harmful bacteria. Since the 1950s, pharmaceutical companies have been using a compound derived from the crab's blood to test the purity of medicines, syringes, food, and clinical specimens.



Today, the product is widely used, but the crab is now an endangered species. Through genetic research, biologists at the National University of Singapore have cloned the enzyme responsible for the clotting reaction, as the genetically engineered compound is superior to the natural one. Several patents have already been granted in the United States of America and Singapore. The compound was licensed earlier this year to a US biotechnology company. Besides contributing to global environmental protection, this is also an example of how scientists in developing countries are benefiting from opportunities in biotechnological research.

The Singapore government has made significant investments in developing its biotechnological industry. The government recently announced that it will invest over S\$2 billion (US\$1.17 billion) in the development of this industry, including a further S\$1 billion in the Life Sciences Investment Fund, to support start-ups and encourage joint ventures in Singapore. The fund will invest in foreign companies to promote spin-off activities in Singapore; encourage the commercialization of new technologies developed by local entities; and invest in locally-based joint ventures to facilitate technology transfer and strengthen industrial capabilities. The government brought in foreign research-based institutions, such as Johns Hopkins University. The Singapore government's initiative provides an illustration of the policies and measures which are being adopted to encourage the growth of knowledge-based industries in developing countries.

Source: Far Eastern Economic Review – http://www.feer.com/review_news/00101862.html and Professor J. L. Ding, National University of Singapore.

PATENTS ARE REVOLUTIONIZING AGRICULTURE TODAY

Agriculture is one of the world's largest industries, providing jobs for 1.3 billion people worldwide and producing US\$1.3 trillion worth of goods annually.⁴⁸ As in the case of other key industries, the growth of the modern agricultural industry is a result of a continuing series of innovations and technological advances, from mechanical inventions to agricultural

compounds and crops with higher yield, improved quality and better resistance to pests and diseases, many of which would probably not have come about without the support of IP rights.

Today, the pace of change is set to accelerate as biotechnology revolutionizes agricultural science.

PROTECTION OF NEW PLANT VARIETIES

New varieties of plants, with higher yields, improved quality or better resistance to pests and diseases, can increase productivity and product quality in agriculture, horticulture, and forestry. For example, plant breeding has contributed around half of the threefold increase in the United Kingdom wheat yields achieved over the past 50 years.⁴⁹ In addition, average rice yields in South and Southeast Asia have almost doubled since the period 1964 to 1966, the years immediately preceding the introduction of the first modern, high-yielding variety. Historically, much of the breeding progress has originated from publicly funded institutes; however, in many countries, such funding is unavailable, or is being withdrawn, resulting in reliance on private companies. Breeding new varieties of plants requires a substantial investment in terms of skill, labor, material resources, and money, and may take many years (10 to 15 in the case of many plant species). However, once released, a new variety can, in many cases, be readily reproduced by others and thereby deprive the breeder of the opportunity to benefit from his investment.

Without an effective system of plant variety protection, breeding activity would be confined to government-funded programs or restricted to breeding varieties which could not be reproduced from harvested seeds in the traditional manner. The existence of a system of plant variety protection (one type of intellectual property), such as that provided by the International Convention for the Protection of New Varieties of Plants (UPOV Convention), allows the breeder of a new variety (in many cases a progressive farmer) an exclusive right to exploit his variety and encourages him to invest in plant breeding,

thereby contributing to the development of agriculture, horticulture, and forestry.⁵⁰ Furthermore, the UPOV system of plant variety protection has an important feature, commonly known as the breeder's exemption, which allows all protected varieties to be used for the development of new varieties without, except in certain specified cases, obligation to the original breeder. This unique provision facilitates a synergistic advance in the development of new plant varieties by building on the combined progress made by all the individual breeders. Another important feature of the UPOV Convention is the so called "farmer's privilege", under which farmers may save harvested material of protected varieties for propagating purposes on their own holdings, as long as the legitimate interest of the breeders is respected.

MORE INCENTIVES FOR AGRICULTURAL R&D IN THE PRIVATE SECTOR

There is an acute need for improved techniques relating to agriculture in developing countries, particularly as problems relating to food security and the pressure of global population growth will be felt mainly in these countries. Acquiring such techniques will require both indigenous innovation as well as the acquisition of technologies from elsewhere in the world. Although research-based programs have been introduced in developing countries, these are mainly funded by the public sector. This is in sharp contrast with countries such as the United States of America and the United Kingdom, where the bulk of agricultural R&D is done by the private sector. In addition, foreign aid for agriculture has been halved since 1986. Thus, it is a reality that for research efforts to intensify in the developing world, significant inward investments are required. Viable approaches include encouraging the growth of a local agricultural technology or biotechnology industry and increasing partnerships with the private sector. These can only come about through, *inter alia*, strengthening IP laws.

As in other areas of technology, IP rights play an important role in securing economic returns for the intellectual and financial investments that make such R&D possible. At the same time, public research institutions should also protect their research results through IP rights, as these can

be used both in negotiations with the private sector and also in deriving income from licensing activities, and will allow such institutions to undertake further R&D in order to contribute to the public good. Many research institutions, including those in developing countries, have started patenting their R&D results. For example, the government-funded Indian Council for Scientific and Industrial Research (CSIR) (see Box - 4.15) was granted 95 patents in the United States of America between 1995 and 1999. As the biggest R&D network in India, CSIR is the first organization to make an explicit IP policy statement aimed at maximizing its intellectual capital through a four-pronged strategy.⁵¹ CSIR defines its goals in terms of numbers of patent filings and operating revenue from licensing. IP rights are particularly important in relation to biotechnology inventions, as these can be easily copied because of the ability of biological materials to reproduce.

BOX-4.15 CSIR – INDIAN KNOWLEDGE CENTER

The CSIR set up an Intellectual Property Management Division (IPMD) in 1996. The main responsibilities of the Division were initially confined to obtaining patent protection for the inventions developed in the constituent laboratories of CSIR. The Division's activities are now extensive. CSIR is the largest filer of patents originating in India, with its international patenting activity doubling every year in the last few years. Statistics of patents show the increasing activity during the last decade.

YEAR	INDIA		FOREIGN	
	Filed	Granted	Filed	Granted
1990-1991	202	55	15	10
2000-2001	410	118	452	56

CSIR encourages web-based marketing of technology, licensing of patents and other forms of intellectual property. There are several cases where CSIR labs have successfully licensed their patents to multinationals, local industry and others. While there is a broad framework in CSIR for providing benefits to its scientists, labs experiment with different models within these broad guidelines to ensure that not

only their research workers but also those who provide technical and administrative support share the benefits of the exploitation of intellectual property. CSIR laboratories have various mechanisms to encourage international patenting of inventions. Some of the labs grant certificates and medals and also provide additional project funds to those who file foreign patent applications. An income-sharing scheme to share the fees received on licensing of patents has been put in place. Internal mechanisms in the labs take care of the screening of publications before patenting. The IPMD of CSIR plays a key role in motivating, guiding and supporting scientists in patenting their research results.

Source: CSIR

GENOMICS: CHANGING THE FACE OF MEDICINE FOREVER

The completion of the first draft of the human genome provides a starting point for a revolution in medical science. Genome science can be applied to the creation of new medicines, as well as individualized medical treatment for genetic diseases.⁵²

The genome draft was achieved through the joint efforts of the publicly funded Human Genome Project consortium and Celera Genomics, a private company. Celera's investments and efforts were based, in part, on their reliance on intellectual property in assisting the company to recoup investments made in genomic research through the conversion of such knowledge into marketable products. The private sector played an integral role in accelerating the mapping of the human genome, and its involvement will continue to be essential in the development and commercialization of revolutionary medicines and treatments based on information derived from the human genome. Without IP protection, it is an interesting question whether it would have been possible for the private sector to assume the financial risks and uncertainties associated with the huge investments necessary for the mapping of the human genome.

Intellectual property protection for gene-based inventions will also play an important role in stimulating the development of new health care products.⁵³

The impact of genomics can also be seen in the emerging alliances between young biotechnology firms and the pharmaceutical giants. For example, a small US biotechnology firm, CuraGen, has created a powerful technology platform to translate the wealth of information deriving from the human genome project and has already filed hundreds of patents. CuraGen and Bayer, a German drug company, agreed to invest up to DM 1.3 billion jointly over 15 years in developing drugs.⁵⁴

We must ensure that benefits derived from scientific and technological advances are directed towards making life better for people in all countries, not just for a privileged few. Genomic science poses new questions for the patent system. For example, whether and under what conditions genes or parts of them (also known as expressed sequence tags) are patentable. The application of computer-automated gene-sequencing techniques and issues relating to computer-assisted assessment of the patentability conditions, are also under discussion by experts.⁵⁵ As with business method patents, the lack of international harmonization in this area raises significant issues in light of the much faster activity in patenting occurring in nations that have approved patenting of genetic sequences. The implications of this development merit careful and serious examination.

Now, research efforts are shifting from genomics to the analysis of the relation between genomes and proteins (protonomics), which needs a very sophisticated use of super computers. In view of the large amount of investment and high expertise required, protonomics research will be undertaken by a limited number of firms and public institutes, as was the case of genomics. The patent system should not only adjust itself to such technological changes in order to stimulate investments but also provide a fair balance between commercial interests and the public interest.⁵⁶

BUSINESSES ACCUMULATE PATENT ASSETS AND PROFIT FROM TRANSACTIONS BASED ON THOSE ASSETS

We have examined in this chapter how the patent system functions to promote economic development by providing valuable information, stimulating technology transfer, promoting investment, and stimulating R&D and new technologies. The patent system also spurs economic development by promoting business activity based on patent assets. Businesses, from multinationals to SMEs, can benefit from accumulating IP assets and engaging in IP licensing transactions. This activity can promote competition and create profitable business opportunities that provide jobs, job training, and human resources development, supply needed goods and services, and increase business and individual income.

Today, the licensing, sharing and distribution of IP assets, rather than litigation, is the *raison d'être* of patents. As one commentator remarked of the biotech industry: "Research costs are beyond the reach of many of the smaller companies... and licensing and cross-licensing agreements allow them to gain the greatest benefit from their patents and those of others and share the cost of development."⁵⁷

Licensing can be particularly helpful to a small company when dealing with a larger company, giving the small company possessing patent assets some leverage in negotiations. A small company with a good patent is in a much better position to seek better prices or other beneficial terms. Joint ownership of inventions or other collaborative efforts is possible when the small company has IP assets to offer. As the patent counsel of biotech start-up Millennium Pharmaceuticals, put it: "In the past we were happy to let the larger pharmaceutical manufacturers develop the drug and do the clinical tests but now the whole process of developing a drug for the market is a completely dual effort".⁵⁸ These licensing joint ventures are not only for expensive technology and the companies of developed nations. Developing nations can take advantage of IP licensing joint ventures (See Box - 4.16).

These examples of licensing are taken from the pharmaceutical field, but IP licensing is a constant in the business world in all fields. Licensing succeeds because companies are able to see mutual advantages in using intellectual property to expand markets and enhance wealth, rather than using it to close markets and exclude competition.

BOX-4.16 INTERNATIONAL BUSINESS-UNIVERSITY JOINT VENTURE FOR AIDS VACCINE

Recently, exciting news of a joint venture for development of an AIDS vaccine was announced. The partners involved in developing and testing the first HIV/AIDS vaccine specifically designed for an African strain of the disease have agreed to joint ownership of the drug's patents. Francis Gichaga, vice chancellor of the University of Nairobi, and Seth Berkley, president of the New York-based International AIDS Vaccine Initiative, signed the three-year agreement on August 25, 2001. The third partner, Britain's Medical Research Council, signed the agreement in the United Kingdom that same week. The parties had tough negotiations but were ultimately able to reach an agreement that reportedly involved continued joint activities with the university and joint ownership of some of the IP resulting from the venture. The vice chancellor said: "This was a delicate matter, requiring a lot of patience and compromise from all parties. The task force was guided by the principle of fairness, equal partnership, and need to equitably apportion credit and any revenues that may accrue from this project".

Source: AIDSWeekly, September 10, 2001

Licensing IP can be tremendously profitable. IBM realized US\$1.7 billion in revenues from patent licensing in the year 2000 alone. Texas Instruments realized US\$500 million.⁵⁹ Total worldwide revenues from patent licensing increased from US\$15 billion in 1990 to US\$110 billion in 2000.⁶⁰ These revenues have the effect of stimulating the wider economy, creating jobs, promoting education, supporting more R&D, and feeding the cycle of creation discussed earlier in this chapter. The Stanford University Office of Technology Licensing realized US\$36.9 million in

licensing income in 1999/2000. These astronomical figures should not convey the impression that technology licensing is only for the major multinational companies or the superstar research institutes. On the contrary, these stellar examples of revenue generation based on patents confirm that licensing is one of the primary revenue-generating functions of patents. The purpose of developing patent assets is often not to prevent others from using the inventions, but to gain revenues from sharing them.

This basic economic fact is the driving force behind licensing ventures worldwide, whether IBM, Biobrás, Dr. Reddy in India, or Cuban biotech ventures. Commercialization of inventions involves not only the production of products, but also the licensing of the right to make, use and sell such products to others, who will pay a royalty back to the inventor.

Patents are now recognized as a hidden value layer. An innovation is not only valuable for the product it permits or enhances and the resulting revenues from its sale, but also because of the revenue stream that is generated by licensing. A trend can be seen in the emphasis on creating patents for direct wealth and not merely for product protection or enhancement.⁶¹

Cross-licensing of patents occurs when both parties to a transaction have IP that they are willing to license. Often cross-licensing will result in a net royalty payment to one side or the other. In other cases, there will be a swap of patents or patent portfolios.⁶² Such cross-licenses often result in larger business relationships involving licenses to other types of IP (copyright, trademarks, and trade secrets) and other areas of cooperation (training, service, sales of products, pricing preferences, options for future business transactions, and so on).

An SME with patent assets can participate in such patent-enhanced business relationships. An SME without patent assets must rely on time-to-market advantage, superior service, and other factors. This is true equally in developed and developing nations.

THE RELEVANCE OF PATENTS TO DEVELOPING COUNTRIES: PATENTS AS POWER TOOLS

As a preliminary, it is important to address the occasionally stated notion that patents, as opposed to other forms of IP, are not relevant to developing countries, because of their relatively low state of technological development. The argument is sometimes made that copyright, trademark and geographical indications may be useful and appropriate in the developing nation context, but not patents, except insofar as developing nations should offer patent protection in order to secure foreign direct investment. Some critics of the patent system claim that patents may even be harmful to developing nations because of the power over markets and pricing that patents confer on their owners.

These ideas – that patents are not relevant to developing nations, or that they are incompatible with the economic objectives of the developing nations – are inaccurate because they give the impression that it is possible to simply opt out of the international patent system, and yet still achieve economic development. This is an error, as patents are an essential component of economic strategy regardless of whether the country is developed or developing.

Many examples described in this chapter indicate that developing countries today, some to a greater extent than others, are adroitly wielding the patent system for optimum leverage on economic development. Indeed, patents are power tools for economic development and the role of governments and policy-makers of developing countries is crucial in determining whether such countries use the power of the patent system for economic development by implementing pro-active patent policies. This chapter has discussed lessons and experiences from successful economies that are useful for policy-makers to understand and, where appropriate, emulate. These lessons and experiences may be distilled in the following suggestions.

PRO-ACTIVE PATENT POLICIES

First, there must be a pro-active patent policy (PPP) that is understood to be intrinsically related to economic development. The Republic of Korea and Singapore's experiences with patent policy confirm the importance of a pro-active approach. Coordination of patent policy with economic development policy is essential, because, as demonstrated earlier in this chapter, patent policy both reflects and influences technology and business development.

Use of patents and a PPP as a power tool must be strategic. A scatter-shot approach, where equal emphasis is placed on all areas of development, is unlikely to succeed. Targeting key areas of development, with a complementary patent policy, appears to be a sound approach. It is a legitimate role of government to provide financial, educational, tax and other incentives to support development in targeted areas. This targeting is practiced throughout the developed world and is no less applicable in the developing world. As long as such policies do not discriminate against non-nationals in intellectual property protection and do not offend principles of "national treatment", there is no legal or policy objection to them. Niche development works well in many countries and has been used to support growth and stability.⁶³ In this sense, patents are simply a reflection of broader economic development priorities and strategies.

In implementing patents as a strategic tool, this chapter has suggested that the patent system has four significant functions: (1) to facilitate technology transfer and FDI; (2) to stimulate R&D at universities and research centers; (3) to serve as a catalyst of "new technologies" and new businesses; and (4) to empower businesses, especially SMEs, with regard to IP asset accumulation, management, and use. These functions are applicable regardless of the difference in culture, religion, political system and the degree of economic development, as long as entrepreneurs are supported by a set of well-planned, coordinated, and pro-active patent policies by the government.

Given that most developing countries are currently importers of technology and financial resources for investment, discussions on the role of the patent system tend to be focused on the facilitation of technology transfer and FDI. However, parallel with policies that promote FDI, policy-makers can adopt policies that support businesses in the accumulation, management and use of patents. Such policies are various and include providing financial and tax incentives for R&D as well as for the improvement and enhancement of old technologies and traditional knowledge. Such development can take place in the context of joint ventures and licensing arrangements with foreign companies as well as in the context of local, indigenous development.

INDIGENOUS DEVELOPMENT

Stimulating R&D at universities and research centers is a way to jump-start such local development. In contrast to the importation of knowledge, universities and research centers provide the “fuel” to keep an indigenous innovation cycle running. Handled properly, patents are efficient drivers of national or indigenous (as opposed to imported) innovation, R&D, product creation and business transactions that have beneficial macro and micro economic effects.

It is important to recognize that patent portfolios can be accumulated based on R&D that is being conducted at universities and research centers in the course of their ordinary research priorities. In other words, harvesting of intellectual property that is being created currently may be as effective as promoting new technological initiatives. Patents are granted on relatively simple technologies that have not had a burdensome R&D cost, as well as on those that have had a tremendous R&D cost. There is certainly some relationship between investment, time, resources, cost and the resulting patent, but it is not a direct and fixed correlation. The key is that whatever activity is being conducted, whether it is agriculture or nanotechnology, de-salinization or recombinant DNA, it can be improved by a new idea that has a practical value. The knowledge potential to make these things happen depends also on the dissemination of information and development of human skills.

Even with minimum access to technological information and skilled human resources, a sustainable and self-generating intellectual cycle starts moving, as useful inventions are often derived incrementally from what has gone before and may also be based on traditional knowledge. In fact, some of the greatest and most fundamental innovations have come from relatively simple tools. Conversely, a large R&D budget by no means ensures creativity, innovation, or practical usefulness. Indeed, some technology companies take the perspective that smaller, start-up companies are more likely to produce creative approaches than large institutions. They intentionally sever financial lifelines to such companies to make them “sink or swim”, and the start-up’s ability to produce inventions is a crucial swimming test.⁶⁴ Also, many inventions in the developed countries are not “high tech”. Business method patents, for example, are not generally based on complex technology. A review of a patent database will quickly reveal patents based on relatively simple technologies, as well as those based on complex, cost-intensive technologies.

Effective use of technology transfer opportunities and utilization of patent information in all of the facets in which such information can be useful is important. Public policies to promote the use of such information are likely to bear fruit in terms of the cycle of creation and new technologies. As discussed earlier in this chapter, patent databases can help developing countries find licensors of technologies that are needed, licensees of technologies that are being locally developed, investors, and business partners.

National policies and the PPP should be designed to promote patent licensing joint ventures and strategic alliances, as these can encourage local invention as well as foreign direct investment. The best of such transactions are a “win-win” for both parties, with approximately equal benefits and costs. The licensee, often the developing country party, can receive rights to manufacture or distribute products and/or technologies in the local or regional market. From such manufacture and distribution, it receives not only revenues, but also training of employees, valuable products and the possibility of lower prices because of local manufacture. The license may also include rights to develop, enhance and distribute related products and technologies in collaboration with universities and research centers. The licensor also receives considerable benefits,

including royalties from markets that are often underserved and rights to use the locally created new patent assets in other markets.

PATENT LICENSING, INFORMATION AND SKILLED HUMAN RESOURCES

Patent licensing operates beneficially only when there is a market in which the licensee and licensor can efficiently make, use and sell products incorporating their inventions. Thus, in strategic patent planning, policy-makers will address market definition. A developing country with a relatively small population of potential consumers or manufacturing base may not be an attractive locale for licensing because the royalties that can be realized in such a market are too small. In order for licensing to work, there must be a big enough market so that royalties can be lucrative. This leads to the logical conclusion that regional collaborations, where all members recognize the validity and enforceability of patents issued by other members, will in some cases create more attractive licensing markets. Further advantages of such regional approaches are the possibilities of leveraging expenses of IP office administration, and information technology, exchanging expertise, and promoting knowledge exchange.

Human capital development is a vital component of patent policy. Sowing seeds in public education, from early childhood to post secondary levels, to encourage creativity, invention, respect for new ideas, and confidence in indigenous development, will bear a rich harvest. It is not enough to teach that IP rights must be respected; the positive benefits to the nation of innovation and intellectual property must also be explained. Young people in developing countries need confidence that their ideas and inventions can have a future. Programs that reward invention, whether science fairs in high schools or financial incentives for employees who develop useful inventions, are important in conveying this message. Public recognition of inventors and awards for their work help the culture see that patents are valuable to the entire society. Grants and other concrete practical support to help inventors commercialize their inventions make it clear that the support for invention is not merely

theoretical, but practical. Public policies to promote innovation and commercialization of inventions from universities and public research centers are also key. Foreign direct investment is a resource for human capital development, especially when based on business agreements that explicitly recognize the value to both parties of employee training, education, and partnership in R&D.

Use of indigenous and local resources is also essential. Patent tools work with the economic landscape of the country. Countries whose wealth is in one field will not wish to gear patent policy towards other fields, just because another country has been successful in that area. So, if a country is focusing on agricultural development, chemicals and irrigation technology, for example, it will not necessarily want to promote licensing of semi-conductor technology or biotechnology. Creative marketing and commercialization of traditional knowledge, culture and folklore, and all other local resources, within the context of the patent system, are important. Traditional knowledge, discussed in Chapter 7, is a great and rich field that can be cultivated for patentable subject matter. Even in cases where the underlying traditional knowledge is ancient, developing nations can take notice that all new technologies are derived from creative application or modification of old technologies.

THE IP OFFICE'S ROLE

As a nucleus for patent policies, planning, and implementation, the importance of IP office administration and the increasingly important role of IP offices as thinkers, policy contributors, and partners in economic development cannot be overestimated. Policies in IP administration that make the patent system accessible, such as electronic filing, help desks, graphical user interfaces that emphasize ease of use, and differential filing fees based on the inventor's gross revenues, are all helpful. Promotion of technology licensing centers and IP management centers where researchers and professors can get help in developing, filing, and commercializing their inventions is necessary.

Use of organizational development (OD) concepts to promote efficiency and user-friendliness in IP administration is beneficial.⁶⁵ Consolidation of industrial property and copyright offices into one IP office that coordinates with ministries responsible for economic development and education may, in some situations, be a helpful step. As a practical matter, using patents as tools for economic development is possible if there is a high level of institutional policy coordination among ministries that affect IP policy.

Finally, effective patent laws, adequate technology infrastructure, and adequate IP protection and enforcement all permit the patent system to work optimally. Enforcement is especially important, as without enforcement of IP rights, the patent system cannot operate in practice as it promises in theory.

CONCLUSION

This chapter has provided an overview of the functions, value, and impact that a patent system has in the age of rapid technological innovation. The patent system needs to be constantly adjusted and implemented so that the best balance between the right holder, new entrants to the market, the public at large and civil society is achieved. The potential of the patent system has been widely recognized in the context of knowledge creation and dynamic innovation.

This chapter has described how patent information and its diffusion stimulates economic development. It has also explored how new technologies have had an enormous impact on the patent system and why some countries swiftly and strategically responded to the challenges from those new technologies by successfully adjusting their patent policies and systems. Two significant fields of new technology – computer and communications technology (including the Internet), and biotechnology – have been examined in detail to show that patent policy decisions will continue to be crucial to the success of the knowledge and technology driven economy in the twenty-first century. Excessively strong patent protection for new technologies may adversely affect economies. Therefore policy-makers will have to consider and implement policies which pro-

vide a balance by offering incentives to stimulate R&D, while ensuring a competitive environment for pioneers.

Finally, patents are a power tool for economic development. This tool can be used by developing and developed nations alike, by multinational corporations as well as SMEs.

- 1 *President of the United States of America from 1861-1865 and also an inventor who received a US patent.*
- 2 **Lester C. Thurow, *Creating Wealth: The New Rules for Individuals, Companies, and Countries in a Knowledge-Based Economy* (London: Nicholas Brealey Publishing, 1999): 5.**
- 3 *Hisamitsu Arai, **The Japanese Experience in Wealth Creation**, WIPO publication No. 834 (E), December, 1999.*
- 4 *Tony Samuel, **Managing Intellectual Property**, November 2000: 46-48.*
- 5 *US Department of Commerce, Office of Technology Policy, **The New Innovators: Global Patenting Trends in Five Sectors** (Washington, D.C.: US Department of Commerce, September 1998).*
- 6 *With the assistance of WIPO, many developing countries began the process of strengthening their patent systems from the early 1980s to 1995, including Argentina, Bangladesh, Benin, Brazil, Burkina Faso, Chile, China, Colombia, Ecuador, Indonesia, Malaysia, Mali, Mexico, Paraguay, Peru, the Republic of Korea, Thailand, and Venezuela.*
- 7 *See for Australia www.ipaustralia.gov.au/services/S_srch.htm;
for Brazil www.inpi.gov.br/pesq_patentes/patentes.htm;
for Canada <http://patents1.ic.gc.ca/intro-e.html>;
for France www.inpi.fr/brevet/html/rechbrev.htm;
for Germany www.dpma.de/suche/suche.html;
for Hungary www.hpo.hu/English/db/;
for Japan www.ipdl.jpo-miti.go.jp/homepg_e.ipdl/;
for Republic of Korea www.kipo.go.kr/ehtml/eLikIndex05.html;
for New Zealand www.iponz.govt.nz/search/cad/dbssiten.main;
for Poland www.arsinfo.pl/arspatent/a_info.html;
for Romania <http://193.230.133.4/cgi-bin/invsearch>;
for Russian Federation www.fips.ru/ensite/;
for Spain www.oepm.es/bases-documentales/oeppmat_sp?;
for Thailand www.ipic.moc.go.th/;
for the United Kingdom www.patent.gov.uk/patent/dbase/index.htm;
and for the United States of America www.uspto.gov/patft/index.html
These are linked to <http://ipdl.wipo.int>*
- 8 *See for WIPO, <http://ipdl.wipo.int/>; for EPO, <http://www.european-patent-office.org/espacenet/info/access.htm>,
for Trilateral Database, <http://www.uspto.gov/web/tws/sh.htm>,
and for Latin America, [http://www.oepm.es/bases-documentales/latipat_sp?
ACTION=RETOUR](http://www.oepm.es/bases-documentales/latipat_sp?ACTION=RETOUR)*

- 9 Increasingly, searchers are able to bypass commercial services and directly access patent data. Robert M. Sherwood, Varda Scartezini, and Peter Dirk Siemsen, "Promotion of Inventiveness in Developing Countries Through a More Advanced Patent System", *IDEA: The Journal of Law and Technology*, Vol. 39, No. 4, 1999: 476
- 10 See e.g. Patent Café at www.patentcafe.com, and Delphion at www.delphion.com
- 11 Michael Peel, *Financial Times* (London), November 17, 1998.
- 12 BTG International (technology transfer firm) survey, 1998.
- 13 Samson Vermont, "Patent Costs and Benefits: The Economics of Patents and Litigation," Part II, *Patent Strategy & Management*, August, 2001: 5-60
- 14 See www.surfip.com
- 15 Nagesh Kumar and N.S. Siddharthan, *Technology, Market Structure and Internationalization: Issues and Policies for Developing Countries* (London: Rutledge/ UNU/INTECH, 1997).
- 16 In the industrialized countries, R&D is usually driven by the private sector with some public sector involvement. For example, in countries such as Japan and the United States of America, it is estimated that between 70 percent and 75 percent of R&D is financed by industry. In the United States of America, the federal government and nonprofit organizations, including universities, finance 85 percent of basic research and only 26 percent of development costs, while private sector expenditure is mainly concentrated on the developmental end of the R&D process where time lags are shorter and the risks are less. Lita L. Nelsen, "Investing in Technology-Based University Intellectual Property," in *Hidden Value: Profiting from the Intellectual Property Economy*, ed. Bruce Berman.
- 17 Recent examples include the funding of biotechnological research at the Singapore Institute of Molecular and Cell Technology by Glaxo-Wellcome, Intel and Microsoft R&D centers in China, Microsoft R&D center in India, and IBM research facilities at the campus of the Indian Institute of Technology in Mumbai. Some developing countries, such as Singapore, have increased their R&D expenditures through assisting private sector R&D activities and collaborating with leading companies that are interested in carrying out research activities in their respective countries. "Oxford University Venture Capitalists," *The Times* (London), November 5, 1999.
- 18 See Stanford's Office of Technology Licensing financial report, www.otl.stanford.edu

- 19 www.autm.net, www.gao.gov and www.cogr.edu
- 20 This paragraph is based on a report by Chen Meizhang and Zhang Hong, "Technology Transfer from Universities in China," *Journal of the Japanese Patent Society* 211 (May 2000): 70-76.
- 21 Dr. Hanns Ullrich, "Use and Exploitation of Intellectual Property in the Country of Publicly Funded Research and Development: Recent Legal Developments in Germany and in the European Union," *Streamlining International Intellectual Property, Proceedings of the 1999 Summit Conference on Intellectual Property, University of Washington, Seattle*.
- 22 Statement on Stem Cell Research by Maria C. Freire, Director, Office of Technology Transfer, National Institutes of Health, US Department of Health and Human Services, before the Committee on Appropriations, Senate Subcommittee on Labor, Health and Human Services, Education and Related Agencies on January 12, 1999. See www.os.dhhs.gov/asl/testify/t990112a.html
- 23 <http://www.autm.net>
- 24 A survey conducted with Japanese members of the Licensing Executive Society (LES) in 1999 (a sampling of some 100 farms).
- 25 Intellectual Property Management Office of Institute of Technology, Bandung, brochure on file at WIPO.
- 26 *The Times*, "Oxford University Venture Capitalists", November 5, 1999.
- 27 Hans Wiesendanger, *A History of OTL* (Palo Alto: Office of Technology Licensing, Stanford University). See <http://otl.stanford.edu/about/resources/history.html>
- 28 Stanford OTL, 1999-2000 Annual Report.
- 29 *NY Times*, July 9, 2001, "Pursuing a New Line in Optical Research".
- 30 http://www.btgplc.com/company_profile/index.html
- 31 <http://www.fhg.de>
- 32 see <http://wis-wander.weizmann.ac.il/>
- 33 For example, nearly one-third of the patents which are issued to IBM in the United States of America are said to be for software-related inventions.

- 34 *In the United States of America, there was a surge in business method filings in 1998 and 1999. Although these applications represent only 1 percent of total patent applications filed at the USPTO in 1999, they have increased significantly, from 700 in 1996 to 2,100 in 1999.*
- 35 *These include Priceline.com's "name your own price for..." system of purchasing goods through reverse auctions (US Patent Number 5897620); Amazon.com's "Method and System for Placing a Purchase Order Via a Communications Network" (US Patent Number 5960411), often referred to as the one-click ordering method, which allows users to make fast track orders; and Doubleclick's patent on a "System and Method for Delivering Customized Advertisements Within Interactive Communications Systems" (US Patent Number 5933811), which covers the manner in which the company delivers advertisements over the Internet.*
- 36 *The issuing of overly broad patents, caused by the unavailability of searchable prior art, is a concern that is often raised in relation to the patenting of new areas of technology, including, in particular, software, business methods, and biotechnology. On March 29, 2000, the USPTO announced a plan to improve the quality of the examination process in technologies related to e-commerce and business-methods. See USPTO, "Automated Financial or Management Data Processing Methods (Business Methods)," USPTO White Paper (Washington, D.C.: USPTO, 2000).*
- 37 *See, for example, USPTO, "Automated Financial or Management Data Processing Methods," http://www.hellopatent.com/us_bm/us_bm.html*
- 38 *See http://europa.eu.int/comm/internal_market*
- 39 *Some have argued that the current one-size-fits-all patent system should be revamped to create a more differentiated system, whereby distinctions are drawn between different types of knowledge and alternative types of patents awarded, in order to arrive at an optimal balance to encourage the production as well as the diffusion of new technologies. Other critics, especially in the legal profession, argue on the other side: that it is a bad idea to differentiate based on subject matter, and that the problems with business method patents stem from problems in the application of the current standards.*
- 40 *UN Secretariat, Commission on Sustainable Development, CSD Report for the 1995 Session on Biodiversity, 1995, E/CN.17/95/7, paragraph 20.*
- 41 *See the Millennium Message posted at the end of 1999 on the WIPO website, http://www.wipo.int/about-wipo/en/index.html?wipo_content_frame=/about-wipo/en/dgo/index.html and Gro Harlem Brundtland, "World Health Assembly Technical Briefing: Scaling up action to tackle illness associated with poverty, The*

- Global Fund for AIDS and Health*” May 15, 2001. See also “Challenges and Opportunities for the Health Leaders of Today,” a statement by the Director-General of WHO in May 2000, at <http://www.who.int/director-general/speeches>
- 42 206 USPQ 193 (1980).
- 43 Under the TRIPS Agreement, countries are allowed to exclude plants and animals from patentability as well as “essentially biological processes for the production of plants and animals.” However, protection must be extended to micro-organisms and “non-biological and microbiological processes.” Moreover, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof.
- 44 Edwin Mansfield, **Intellectual Property Protection, Foreign Direct Investment and Technology Transfer**, *International Finance Corporation Discussion Paper No. 19*, (Washington, DC: The World Bank, 1995).
- 45 “The Jiang Zemin Theory,” **Singapore Straits Times**, October 30, 2000.
- 46 *Far Eastern Economic Review*, October 28, 1999.
- 47 “Science and Technology: Balm for the Poor,” **The Economist** (August 14, 1999).
- 48 “Agriculture and Technology: Growing Pains,” **The Economist** (March 25, 2000).
- 49 *British Society of Plant Breeders, Plant Breeding: The Business and Science of Crop Improvement*, (Cambridge: British Society of Plant Breeders, 2000). Facts About IRRI, <http://www.cgiar.org/irri/aboutirri.htm>
- 50 UPOV is a sister intergovernmental organization of WIPO. Its mission is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society. Plant breeders’ rights are provided on the basis of the International Convention for the Protection of New Varieties of Plants of December 2, 1961, as revised at Geneva on November 10, 1972, on October 23, 1978 and on March 19, 1991 (<http://www.upov.int>).

- 51 BBC Monitoring South Asia – Political; London; Aug. 4, 1999.
- 52 Words of former US President Bill Clinton in a joint video press conference with UK Prime Minister Tony Blair, June 26, 2000.
- 53 Joint Statement by former US President Clinton and UK Prime Minister Blair on March 14, 2000.
- 54 “Biotechnology, Rites of Passage,” *The Economist* (January 20, 2001): 63.
- 55 For example, within the framework of the Trilateral Cooperation, the European Patent Office, Japan Patent Office, and USPTO published a joint study of the examination standards for patent applications containing gene sequences (see http://www.jpo-miti.go.jp/saikine/tws/sr-3-b3b_bio_search.htm). WIPO has also hosted a number of meetings to discuss issues and problems arising from biotechnology. Projects suggested by the consultants to the WIPO Working Group on Biotechnology, are described in document WIPO/BIOT/WG/99/1.
- 56 See, for example, Richard Oliver, “The Coming Biotech Age; the Business of Biomaterials,” (McGraw-Hill Trade, December 1999): 252.
- 57 Tabitha Parker, “Biotech Companies Call for Patent Reform”, *Managing Intellectual Property*, June 2001: 20.
- 58 *Id.*: 21.
- 59 “IBM Research Lab Sets the Pace”, *International Herald Tribune*, September 11, 2001: 13.
- 60 Kevin G. Rivette, David Kline, “Discovering New Value in Intellectual Property,” *Harvard Business Review*, January-February, 2000: 59.
- 61 “IAMs and Beacheads: IP Predictions”, Harold C Wegner, *Patent Strategy and Management*, August 2001; Rivette and Kline: 56.
- 62 Rivette and Kline: 57 describe a classic IP cross license between Dell Computer and IBM.

- 63 *Switzerland is an example of such a targeted approach, where, historically, watch-making and, now, financial industries and pharmaceuticals are recognized as key areas.*
- 64 *The history of California's Silicon Valley is a case in point. An important element of economic growth in that region could be attributed to two young inventors (William Hewlett and David Packard) who, working in a garage, invented an audio oscillator. These two individuals came up with fundamental semiconductor inventions that led to the creation of the technology giant Hewlett-Packard. See www.hp.com/hpinfo; see David Packard, *The HP Way: How Hewlett and I Built Our Company* (Harper Collins Publishers, 1996).*
- 65 *See Kim S. Cameron and Robert E. Quinn, **Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework** (Addison-Wesley Longman Inc., 1999).*

CHAPTER 5

TRADEMARKS AND GEOGRAPHICAL INDICATIONS

In Shakespeare's *Romeo and Juliet*, guileless Juliet from her moonlit balcony asks:

*What's in a name? that which we call a rose
By any other name would smell as sweet;
So Romeo would, were he not Romeo called,
Retain that dear perfection which he owes
Without that title.*

Act II, Scene II, **Romeo & Juliet**, William Shakespeare.

Alas, as poor Juliet learned, names are important. So with trademarks, a name is powerful because of what it represents. A trademark is a symbol of the product; it communicates a message to the consumer about what he or she is seeking to buy.¹ For example, the trademark Dove™, the name of a kind of bird, when used as a trademark for soap, evokes a series of associations: peacefulness, cleanliness, purity, etc.² A bird by another name, when used as a trademark for soap, say Sparrow, Peacock, Ostrich, or Mudhen, would communicate a very different message.

In the business world, trademarks are an important part of marketing strategy. A trademark (also known as a "mark")³ can be a word, a slogan, a logo, and a color or a combination of colors, sounds, or even a fragrance.⁴ An established trademark with positive customer recognition may be the single most valuable intellectual property asset, or even the most valuable asset of any kind, that a business can possess. For example, the trademarks Coca-Cola™ and Marlboro™ have proven to be extraordinary economic assets in terms of return on the original and continuing investment made in creating and protecting them.⁵

This chapter describes the macro-economic and micro-economic functions of trademarks: how they benefit society and consumers by fostering innovation and investment, as well as how they are used strategically by individual enterprises.

Because trademarks play a strategic role in business, they interact dynamically with the constantly changing business environment. We will

explore the changing uses of trademarks in a new global economy characterized by international trade in goods and services, technological complexity, and the Internet.

We will also examine the related IP concepts of service marks, certification marks, collective marks, trade dress, and geographical indications. *Service marks* are names used to identify a service, as opposed to a good (e.g. Tata Group™ is a service mark, whereas Tata Indica™ for a car is a trademark) and function like trademarks. *Certification marks* are used to indicate that a good or service complies with a standard or specification (e.g. UL logo to show electrical safety). *Collective marks* are marks used to identify the goods and services belonging to members of an organization (e.g. UAW for United Auto Workers). *Trade names* are names used to identify a business (e.g. Sony Corp.). *Trade dress* is the distinctive overall appearance of a business, and in some cases of a product, and generally includes one or more trademarks and service marks in the form of symbols, slogans and logos. *Geographical indications* identify a good as originating from a region or locality, such as “Champagne”, “Chianti”, or “Darjeeling”.

Trademarks and their related legal concepts are powerful tools for IP empowerment. Uniquely among all other forms of intellectual property (except the most closely guarded of trade secrets), a mark properly maintained and used endows its owner with exclusive rights *forever*. Trademarks, therefore, are an important element of wealth creation strategies for enterprises.

THE ORIGIN OF TRADEMARKS

Marks have been used to identify the source of goods for a long time. There is evidence that, as far back as 4,000 years ago, craftsmen from China, India, and Persia used either their signatures or symbols to identify their products. Roman pottery-makers used more than 100 different marks to distinguish their work, the most famous being the Fortis mark, which was imitated by many on counterfeit goods. These craftsmen are believed to have used marks for several purposes, including as an adver-

tisement for the makers of the products, as proof that the products belonged to a particular merchant in the event of an ownership dispute, and as a guarantee of quality.⁶

In the Middle Ages, the use of marks eventually became associated with the development and growth of skilled trades, and hence the term “trademarks.” Marks were used to show that a product was made by a member of a guild known to have experience in the trade. In French, the term is “*marque déposée*”, where *déposée* meant that the mark was registered with a trade guild. In modern times, trademarks have developed into identifiers of products from individual companies and are important business assets. As branding has become an important marketing concept, the legal protection afforded to trademarks has grown in importance as well. Today “trademark” has become almost synonymous with “brand”. The term “brand equity” denotes the financial value of trademarks in their contribution to the good-will associated with a business.

ECONOMIC BENEFITS OF TRADEMARKS

Trademarks serve two primary macro-economic functions: (1) they facilitate consumers’ decision-making about their choice of products in the market; and (2) they provide incentives for an enterprise to invest in development and delivery of goods and services with the qualities consumers desire.⁷ Trademarks aid consumers’ decisions in situations where it is difficult to verify product source or service quality quickly and cheaply. For example, when buying television sets, automobiles, or computers, consumers should be able to rely on trademarks as symbols distinguishing goods or services provided by different enterprises and indicating products’ features and qualities. Trademarks encourage investment in quality when businesses recognize that brand equity is built only when customers’ post-purchase experiences confirm the message communicated by the trademark and the claims made in the advertising associated with the trademark. Businesses are willing to invest in non-obvious quality features because the long-term reputation of the brand depends on consumer satisfaction.

These two functions are complementary and mutually reinforcing. When customers chose a product because of the qualities suggested by its mark, and when businesses invest in quality to continue to build brand reputation, the result should be improved quality that yields customer loyalty to the brand.

TRADEMARKS FACILITATE CUSTOMER DECISION-MAKING

Consumers are faced continually with the problem of choosing between goods offered for sale that look alike, but whose superficial similarity may conceal differences in features and quality. Often it is only by chance that consumers select the product with the desired qualities. While it is appropriate for sellers to offer goods with different levels of quality, consumers need a “shorthand” method to identify these differences in quality in order to arrive at a satisfactory purchase decision. Trademarks can help consumers to reduce their search costs.⁸ Trademarks are used in conjunction with advertising (product promotion, literature, packaging and point of sale displays) that communicates information about the product. The consumer may have previous experience with the product and the associated trademark; he knows whether in the past the connotations of the trademark were supported by the actual quality of the product.

It is easy to understand the valuable information-providing function of trademarks if one imagines living in a world in which all products are sold in beige boxes, without trademarks to represent (and call the consumer’s attention to) product attributes and features. Choosing a camera, for example, would be difficult indeed. Some might argue that information could be communicated effectively by simply having a list of features affixed to the box, without the benefit of trademarks, similar to lists of ingredients on containers of food. However, visual, artistic and symbolic representations help consumers who may not have time to process and read all of the detailed information about a product, provided the representations are accurate, of course. Even the hypothetical “features” list is helpful only if it is truthful. A trademark may indicate to the consumer which list, and the product it describes, is more reliable than another.

Consumers appreciate the way that a trademark telescopes and condenses important product information, based on the consumers' perceived need for the product. For example, the term "EAZY" when used in conjunction with a trademark and applied to a product (e.g. "TMXXEAZY") signals to the consumer that the product is relatively easy to use. This may be as important and useful as a detailed technical description of the features that makes the product easier to use than another.⁹ Also, trademarks may be used by informed consumers as a supplement to more detailed product information, as a way to narrow choices and make good buying decisions.

Advertising has been viewed by some economists as unnaturally creating demand and perpetuating oligopoly through artificial product differentiation.¹⁰ It has also been seen by some critics as a form of psychological manipulation that could influence consumers to differentiate mentally between products that are in reality similar or identical and to persuade them to accept exaggerated or false quality claims. According to this analysis, advertising allows a trademark owner to gain sales based on psychological suggestion alone and also to gain power over pricing by enabling the trademark owner to charge more for a product than it should, based on its quality and features.¹¹ Recent critics of globalization portray trademarks and logos in particular as part of a negative cultural phenomenon in which brands have become cultural icons or abstract expressions of emotions and psychological states, rather than beneficial tools for consumers.¹²

A different, more positive perspective asserts that trademarks and advertising convey useful information to consumers who are capable of making intelligent decisions based on available, if imperfect, product information, as well as on prior experience with the product.¹³ This view is based on the distinction between a product's simple characteristics that are observable (such as price, shape, and product category) and its more complex characteristics that can only be experienced (for example, taste or long-term durability or complex feature sets).

The pro-advertising view emphasizes that advertising and trademarks reduce consumers' search costs and foster quality improvement in goods and services, resulting in more orderly marketing of goods and

services and less consumer deception.¹⁴ Trademarks may enable consumers to economize by saving the time they would otherwise spend searching for products of the desired quality. They also help consumers realize that, for example, even though two products have a similar chemical formula, they would not necessarily be of equal quality.

TRADEMARKS MOTIVATE SELLERS TO INVEST IN QUALITY

The second macro-economic function of trademarks is that they motivate sellers to invest in product quality so that the trademark's positive connotations will be confirmed by the consumers' experience with the product and services. Trademarks that have become popular are often good indicators of the level of quality of the product or service to which they relate and the public's general satisfaction with them. This motivates many firms that are successfully using their trademarks to continue producing products or providing services that can satisfy their customers based on a long-term business perspective. Thus, trademarks encourage sellers to invest in product quality, maintenance, and improvement, which benefit society as a whole.¹⁵

In short, the trademark owner reaps what he sows – customer loyalty in exchange for investment in quality. Conversely, poor quality associated with a trademark is extremely damaging to a business. Negative customer experience with the product will reflect poorly on the trademark, and it will become a symbol with the opposite of its intended effect. By providing a conspicuous form of identification, trademarks create accountability. As a senior executive of the Indian conglomerate, Tata, put it, “[A]s economies develop and consumers have more spending power, people don't buy products. They buy a promise. A brand is nothing but a way of expressing a promise.”¹⁶ A consumer buys a product because the brand “promises” a certain quality, but if the promise is broken and the product is disappointing, the consumer is discouraged from buying the same brand of product again.

Trademark protection has significant economic advantages for a society because it encourages sellers to invest in the quality of products that are being advertised.¹⁷ Sellers make such investments in quality because they know the power of branding. They appreciate that the consumer's experience with the brand and the product may not be short-lived but can lead to a long-term product preference because of brand loyalty based on repeated satisfactory experiences with the product.¹⁸

STRATEGIC USE OF TRADEMARKS IN BUSINESS

Trademarks are used by enterprises as marketing tools in a variety of ways. The most common is in consumer advertising to promote product sales, but trademark use has become increasingly sophisticated and varied. Today, the litany of trademark uses is long (see Box - 5.1).

BOX-5.1 AN ESTABLISHED TRADEMARK CAN

- increase unit sales,
- cement customer loyalty,
- assist in response to competitive pressure,
- increase revenues and profitability,
- expand and maintain market share,
- differentiate products,
- help introduce new product lines,
- gain royalties through licensing programs,
- provide the foundation for franchises,
- support strategic partnerships and marketing alliances,
- justify corporate valuation in financial transactions,
- raise awareness of charitable causes,
- signal compliance with safety requirements,
- show fulfillment of technical specifications,
- ensure interoperability of complex technical systems.

INCREASING CUSTOMER SALES

The most obvious use of trademarks and service marks by businesses is to promote the sale of products and services. Customer brand recognition increases sales in terms of numbers of units sold, as long as the message the trademark communicates is a positive one. This phenomenon of brand value has been dealt with above, and there are abundant case studies and examples of trademarks used to increase sales. However, it is important to recognize that a trademark campaign alone may not boost sales. The trademark must be an effective one – meeting the legal and marketing requirements for a distinctive mark – that communicates the right message to the consumer. Moreover, a good trademark or service mark will function most effectively when it is related to a total business and product improvement strategy (see Box - 5.2).

BOX-5.2 BANYAN TREE RESORTS BUILT ON SOLID ROOTS

A Singaporean couple, Ho Kwon Ping and his wife, Claire Chiang, had once lived in Yung Shue Wan, or Banyan Tree Bay in Hong Kong*. It was a relaxing place with sentimental meaning for them. In building their successful chain of spa resorts, they knew a good trademark and logo were essential. "We wanted to create something that would conjure up certain images – romance, rejuvenation, intimacy – in people's minds. Everything we've done has tried to reinforce that." They chose BANYAN TREE RESORTS as their service mark, but knew that using the name of a known plant, their trademark also had to be established as representing something special, otherwise the name might be adopted by any unscrupulous hotel owner and be diminished by use with lower quality accommodations. They built almost all their resorts from the ground up, and made certain that distinctive, pleasurable features of each resort were maintained as an expression of super-luxury. They declined licensing of the trademark, insisted on operating their hotels rather than outsourcing management, and declined certain commercial opportunities. They felt there was "a premium in keeping the brand small and exclusive". In 1999, Banyan Tree Resorts

was named number 18 in a list of Asia's top 50 brands issued by Interbrand, a major branding consulting firm.

* "Hong Kong Special Administrative Region of China" – hereafter referred to as "Hong Kong SAR".

Source: Far Eastern Economic Review "Putting Down Roots", May 25, 2000.

CEMENTING CUSTOMER LOYALTY AND RESPONDING TO COMPETITION

A closely related trademark and marketing concept is that trademarks help to cement customer loyalty. Studies show that customer retention is as effective in generating revenues as the attraction of new customers. "Reducing defections by just 5 percent generated 85 percent more profits in one bank's branch system, 50 percent more in an insurance brokerage, and 30 percent more in an auto-service chain".¹⁹ Thus, to the extent that marks help to cement customer relationships, they are extremely valuable. A trademark reflects the image of what the company stands for and its products or services. It represents the goodwill that a firm has earned by making the types of investments in product quality described earlier in this chapter. Its principal benefits are the positive image, acceptance and trust that consumers associate with the company, and its ability to help ensure long-lasting customer loyalty.

A classic study of trademark use to cement customer loyalty is the story of the Kodak™ brand. An effective campaign was developed over the years to associate the trademark Kodak™ with quality film that can be trusted to capture intangible and fleeting elements of "hominess" and family relationships.²⁰ A key purpose of the very successful advertising campaign was to convey to customers that Kodak™ film was familiar, reliable, and could be trusted. It was hoped that customers, having been so used to seeing Kodak™ film used by their families when they were growing up, would be encouraged to purchase Kodak™ film for their own family photos, rather than taking a chance on new brands that might be less expensive.

Trademarks may be used to combat predatory pricing (selling a product below cost in order to drive a competitor out of business) and other unfair business practices such as where a competitor sells a functionally similar but lower quality product at below cost or very low prices, trading on the good will of another company, in order to gain a competitive edge. One of the most effective methods of preventing sellers of low-quality products from driving out the sellers of high-quality products is through the use of brand names.²¹ A strong brand gives the producer of the higher quality product an opportunity to communicate to the potential consumer the superiority of that product.

INCREASING REVENUES FROM PRODUCT SALES

In addition to increases in unit sales, trademarks can serve to increase revenues from the sale of products because customers may be willing to pay higher prices for products if they feel that the product and its quality and features – as communicated by an effective trademark – are worth the price. Businesses use trademarks to differentiate products to show superior quality or differences in features and characteristics. Trademarks enable companies to stake out a higher end market, to show customers that their products appeal to more discriminating purchasers or purchasers with more esthetic or more stylish “taste” (see Box - 5.3). Trademarks may even communicate that a business is willing to take risks that other companies are not willing to take, in order to reach higher levels of quality or innovation.

An interesting example of such a trademark strategy may be seen in the case of Asahi Beer’s Asahi Dry™ mark. Asahi recognized that Japanese customers value innovation as an independent quality. It therefore promoted the concept that its new trademark “Dry” beer was the latest innovation in beer, creating a new product. This campaign over the last decade, claimed to have “completely changed Japanese beer”, offering an “alternative taste” so that Japanese consumers now prefer a “light and dry” taste which enabled Asahi to obtain the top market share in Japan for the first time in 2001.²²

BOX-5.3 PICKWICK STYLE MAKES FASHION STATEMENT

Today Pickwick is a stylish Italian clothing company appealing to thousands of young adolescents across Italy and, increasingly, across Europe. But not long ago, Pickwick™ was just an imaginative mark, depicting a young faceless boy with a rebellious hairstyle, in the mind of its creator Diego Barbaresi. Mr. Barbaresi initiated his company by selecting clothing, adding his distinctive mark and, with the help of his partner, distributing it to the local Rome shops. The trademarking activity was carried out in a garage on the periphery of the Italian capital at very low cost.

Pickwick is today seen as a story of successful marketing and of highly effective use of trademarks. Clothing manufacture is still subcontracted, and Pickwick focuses on production, adding the trademark, marketing, and distribution. Young Italians perceive the Pickwick™ logo as fashionable and pay extra for clothing with the Pickwick™ trademark. A good trademark may indeed be the crucial ingredient for a successful business.

Source: La Repubblica, October 23, 2000.

GAINING OR MAINTAINING MARKET SHARE

Trademarks are used to introduce a new player into an established market and also as a tool to gain a larger share of the market in which the trademark owner is playing. Apple Computer Inc.'s extraordinary "Think Different" campaign is an example of the use of trademarks to remind customers of the unique contribution of Apple to the development of computers, in an attempt to regain market share (see Box - 5.4). There are numerous stories of companies whose executives were dissatisfied with middling market share and embarked on a campaign to stake out a larger territory, a larger group or set of consumers, by means of an advertising campaign associated with a trademark or slogan.

Despite such success stories, it is important to recognize that a trademark and advertising campaign must be intrinsically connected to the business proposition of the company. The trademark is the tip of the iceberg; beneath the successful trademark campaign there is a massive foundation. Much work must go into defining the market segment that is to be attracted; determining how and why it will be attracted to the product; designing the product so that it meets the target customer's desires; identifying a mark that relates to and symbolizes what that customer wants; making sure that the product actually will meet customer expectations in all of its aspects; and coordinating marketing, pricing, packaging, distribution, service, and advertising efforts. Without a solid foundation, even the most clever trademark is unlikely to be a strategically effective marketing tool.²³

BOX-5.4 THINKING DIFFERENT – THE APPLE COMPUTER CAMPAIGN TO REGAIN MARKET SHARE

From the late 1970s through the early 1990s Apple Computer, Inc., was a leader in the sale of personal computers with very high profit margins and large market share, especially in education, scientific and design applications, and personal computing. The original Apple Computer operating platform was followed by the Macintosh™ computer (in North America, Macintosh is the name of a variety of apple). However, in the 1990s the company found itself in the precarious position of losing market share to IBM-compatible computers using the competing Microsoft “Windows™” operating system. Once the darling of computer enthusiasts, Apple was struggling to keep its ever-diminishing market share, watching its strong markets diminish and its base of developers for the Macintosh™ platform decrease. There was fear that Macintosh™ systems seemed doomed to extinction.

Apple's founder, Steve Jobs, returned to the company with a fanfare in 1997, and one of his first steps was to launch the bold “Think Different” advertising campaign. This campaign featured a series of advertising still shots featuring famous people (Gandhi, Jane Goodall, Alfred Hitchcock, Albert Einstein, etc.) who had dared to take a

different path and yet succeeded in some extraordinary way. The ads utilized an understated black and white design and the simple, ungrammatical words “Think Different” placed off to the side in Apple’s familiar font.

The ad campaign generated controversy, with some critics pointing out the slogan should have been corrected to “Think Differently” and that it emphasized individuality over business acceptability. However, Jobs’ gamble was successful. The Think Different campaign – a gutsy assertion that consumers would do better if they dared to be different – celebrated Apple’s association with creativity and individuality. Paired with product development work to support the message, this slogan put Apple back into the race. It reminded consumers who had previously purchased Apple computers why they had valued them and should return to them, and attracted new customers who appreciated the qualities of Apple computers.

INTRODUCING NEW PRODUCTS OR REPOSITIONING AN EXISTING PRODUCT

Trademarks may be used to introduce new products where the trademark has already been established in connection with an old, well-respected product, and the trademark thereby gives the new product a market boost. The introduction of a new product into the market is usually a very expensive undertaking, as considerable effort is needed to acquire the recognition by consumers of the product among other competing products on the market. Consider, for example, that there are more than 750 brands of automobile, 150 brands of lipstick, and 93 brands of cat food.²⁴ With this overwhelming variety of choice, many consumers may be reluctant to try new products. Thus, only the brand names that have developed superior consumer acceptance get noticed.

Trademarks facilitate the introduction of new products when such products are marketed in connection with established brands. In recent years, new products have often been marketed in association with old brand

names, in an effort to assure the prospective consumer of their quality.²⁵ This practice has become popular as companies have come to realize the economic power of well-established brands. Indeed, successful brands tend to have a long life span, providing higher returns and thus increasing their worth. For instance, Ivory™ (soap), Eveready™ (batteries), Nabisco™ (biscuits), Kellogg™ (cereal), Kodak™ (cameras), Gillette™ (razors), and Coca-Cola™ (soft drinks) were the leading brands in 1925, and they continue to be leading brands today.²⁶ Investments in building up strong brand names have proven to be a good strategy for long-term growth, and for reaching different sections of the marketplace.

Trademarks may also be useful in introducing or repositioning an existing product, or in changing the public's perception of a product with which it is already familiar in some form. An interesting example of this use is the new logo for the 2008 Olympics to be held in Beijing. The new logo takes the old, familiar interlocking rings and stretches them into a calligraphic shape that looks somewhat like a runner, but also looks like a person practicing T'ai Chi. According to Interbrand, an international branding agency, the logo was designed to show that China was extending itself to accommodate the Olympics, creating a new image for itself.²⁷ Seen in this light, trademarks are used as part of a larger effort to create a new image.

DISTINGUISHING PRODUCT LINES WITHIN AN ENTERPRISE

Trademarks work to distinguish different product lines within the trademark owner's enterprise. For example, if a company has several different business units or product lines, trademarks may be used to avoid the confusion that might arise if the consumer was faced with several different products with the same name. Compound marks may be used so that a single unifying mark, often the company name, is used with several product-related marks (see Box - 5.5).

BOX-5.5 SWEET STRATEGY: ARCOR GROUP (ARGENTINA)

Arcor is a world-leading manufacturer of candy and the biggest chocolate manufacturer in Latin America. In order to support its international expansion and to enhance its competitiveness, the Arcor Group redesigned its corporate visual identity. The new corporate logos symbolize Arcor's new corporate strategy and help the company achieve its strategic goals in two ways: (1) they provide the Arcor Group with a new visual identity and (2) they individualize the different areas that constitute the company's core business (foods, sweets, chocolates, and cookies).

Source: www.arcor.com.ar and
http://www.arcor.com.ar/quienes_somos/grupo_historia.asp

EARN ROYALTY INCOME THROUGH LICENSING AND FRANCHISING

Trademarks are used by businesses as the linchpin of lucrative licensing programs.²⁸ There are many different types of trademark licensing. Sometimes, there is a simple license of the trademark, often for use in a different market segment than that exploited by the trademark owner (e.g. licensing the name of a baseball team for use on a coffee mug). Character licensing is a common type of trademark license, where a popular character from a book or a movie is licensed to licensees who exploit the character in a different business segment catering to the same customer base. In such cases, the rights to exploit the characters may turn into an intricate maze of different rights to different market segments. One example of a highly lucrative character license is the Warner Bros. acquisition of worldwide merchandizing rights for the Harry Potter™ character in the popular children's book series by J.K. Rowling. Warner Bros. has in turn divided up these license rights among various of its business partners/licensees: Hasbro will have the rights to develop and distribute trading cards and youth electronic games; competitor Mattel will make toys; another company has the rights to make "interactive candy"; Electronic Arts, the California software entertainment

company, is licensed to make Harry Potter™ computer and video games; and Coca-Cola secured still other rights relating to the marketing of the first Harry Potter™ film.²⁹ Seen in the context of this complex network of agreements, the trademark license becomes a way of “extending the brand” and co-marketing, so that each product helps sell the other products by reinforcing the popularity of the character. Visualizing the network of licenses like a series of streams running into a larger river, one can see that the various licenses potentially channel increasing royalty revenue flow back to the trademark owner.

A trademark may be only part of a larger licensing program for a package of intellectual property (e.g. licensing the right to manufacture a pharmaceutical, including patent rights, rights to technical documentation, and rights to use the trademark drug name in connection with its sale and distribution).

The important point in the latter case of a comprehensive IP license is that the trademark is often the handle or pivotal point that makes the entire licensing transaction effective from a business perspective. Thus, the right to manufacture and sell a patented product is rendered far more valuable if the right to use a recognized drug name is included in the deal. In some cases, the good-will in a trademark is such that the grant of other IP rights might be commercially weak without the corresponding trademark license. Imagine an international license to manufacture and distribute a popular soft drink, but without the right to use the name. Some drinkers might recognize the taste, but most would have to be convinced to develop a taste for the drink as if they had never tasted it before.

TRADEMARKS AND FRANCHISING GO HAND IN HAND

A good set of logos, slogans, and trade dress is the *sine qua non* of franchising. The International Franchisee Association estimates that franchising accounts for one-third of all US retail sales, including the sales of firms such as McDonalds, Coca-Cola, General Motors, and Re-Max.³⁰ The way franchising works is that the franchisee and

franchisor conclude an agreement that has several components, generally including terms concerning purchase of equipment and supplies, but always including a trademark license. The trademark license permits the franchisee to conduct a business using the franchisor's trade name, trademarks, trade dress, methods, and procedures. In exchange for these rights, the franchisee pays a royalty and/or a flat fee and agrees to conduct the business in ways that maintain the good-will associated with the mark.

As with licensing deals not involving franchises (see above), often the greatest element of value in a franchise agreement is the right to use the franchisor's trademark. A license to sell McDonald's™ hamburgers and a purchase agreement to buy McDonald's™ supplies, but without the right to use the familiar logos, wrappings, or the all-important name, would be a diminished license indeed; it would lack the good will that has attached to the McDonald's™ brand throughout the decades of its existence. Some McDonald's™ fans might recognize the taste of the hamburgers, but the number is probably low.

ESTABLISHING STRATEGIC ALLIANCES AND PARTNERSHIPS

Trademarks are useful in establishing strategic alliances because the marks of one company may complement the other, just as the products of the two companies may be complementary. Co-branding arrangements reinforce joint marketing programs. With the advent of the Internet as a powerful marketing tool, it is common to see websites where marks of different, distinct companies are combined to demonstrate to the user the complementarity of products or the utility of joint ventures. In particular, "partner pages" are common, where web links are made to companies with whom the website owner has some type of established business relations. The logos and names of these companies are arranged in a constellation around the logo of the web site owner.³¹ This display gives the user an immediate visual understanding of the businesses that are in some way involved in the product.

The overall effect of co-branding arrangements is, as always, to communicate a message to the potential consumer. The message that co-branding often conveys is the classic and age-old message that the sum is greater than its parts; that the companies have joined forces to accomplish something larger than they could accomplish successfully alone, whether it be better products, larger markets, interoperable equipment, joint solutions to technical challenges, tools that enhance each other's performance, reliability of service, or some other feature. A classic application of the strategic use of a trademark to cement strategic alliances is the Intel Inside campaign (see Box - 5.6).

BOX-5.6 INTEL INSIDE

An American manufacturer of microprocessors, Intel Inc., produced successive generations of "X86" microchips (the 8086, 286, 386, and 486). However, Intel did not take trademark protection for its numbering system. As a result, its competitors such as AMD, Chips and Technologies, and Cyrix also used the X86 name for their own processors. Realizing its mistake, Intel, in 1991, started encouraging computer manufacturers such as IBM, Compaq, Gateway, and Dell to put the "Intel Inside™" logo in their computer advertisements and on their packages. The incentive to computer companies was a cooperative advertisement allowance paid by Intel that amounted to 3 percent of the company's purchases of Intel's processors (5 percent when the logo is put on the packaging).

The campaign resulted in more than 90,000 pages of advertisements in an eighteen-month period, with a potential US\$10 billion exposure. The recognition of the Intel brand among business end-users went up from 46 percent to 80 percent. After a full year of the Intel Inside campaign, Intel's worldwide sales went up by 63 percent in 1992. Prominent display of the Intel Inside logo by the leading computer manufacturers have influenced consumers to think that Intel's micro-processor must be very good.

Source: Chiranjeev Kohli and Mrugank Thakor, "Branding Consumer Goods: Insights from Theory and Practice," *Journal of Consumer Marketing* 14, No. 3 (Spring 1997); Aaker, David A., *Building Strong Brands*, The Free Press, 1996: 12-13.

TRADEMARKS AS ASSETS IN FINANCIAL TRANSACTIONS

Because trademarks are powerful marketing tools, they have become important as elements of value in financial transactions such as acquisitions and mergers. Indeed, brand names have become the most valuable assets of a growing number of companies, often exceeding the value of their physical assets. In recognition of the value of its long-established brand name, Nestlé acquired Perrier for US\$2.5 billion.³² Similarly, Philip Morris acquired Kraft for US\$13 billion, which was more than 600 percent of its book value. Through this purchase, Philip Morris expected to gain the loyal consumer franchise of Kraft, to be used to leverage the grocery trade, and as a brand name that could be extended.³³ More examples of the value of brand names are shown in Table - 5.7.

TABLE-5.7 THE WORLD'S MOST VALUABLE BRANDS 2001

Rank	Brand	2001 brand value (\$MM)	Percent change (2001 vs 2000)	2000 brand value (\$MM)	Market cap of parent company (@ July 2001)	Brand value as percent of market cap (@ July 2001)
1	Coca Cola™	68,945	-5%	72,537	113,400	61%
2	Microsoft™	65,068	-7%	70,197	380,000	17%
3	IBM™	52,752	-1%	53,184	198,700	27%
4	GE™	42,396	11%	38,128	498,600	9%
5	Nokia™	35,035	-9%	38,528	104,200	34%
6	Intel™	34,665	-11%	39,049	202,200	17%
7	Disney™	32,591	-3%	33,553	60,000	54%
8	Ford™	30,092	-17%	36,368	45,900	66%
9	McDonald's™	25,289	-9%	27,859	35,400	*
10	AT&T™	22,828	-11%	25,548	148,950	15%

* The value of this brand takes account of all the earnings made both by the parent company and its franchisees. Because of this, a comparison with the parent company's market cap is not legitimate.

Source: Interbrand Survey - www.interbrand.com

TRADEMARKS USED TO SHOW COMPLIANCE WITH SAFETY AND TECHNICAL SPECIFICATIONS

Collective marks show membership in a group, and certification marks are used to show that a product complies with a safety standard or a technical specification. An example of the former is the mark indicating a product was made by members of an American labor union. An accompanying advertising campaign featured a large group of workers singing, urging consumers to “look for the Union label™”.

The consumer knows that it is important that a product not explode or cause electrical fires or some other safety problem. Generally, unable to ascertain whether a product meets safety requirements based on inspection alone, and unable or unwilling to test the product, consumers may benefit greatly from seeing a certification mark that shows that testing has been carried out. The most famous of the safety certification licensors is Underwriters Laboratories, which licenses the famous “UL™” logo to certify that the licensee has complied with safety testing for electrical appliances.³⁴

TRADEMARKS USED TO RAISE AWARENESS OF CHARITABLE CAUSES OR PROJECT A NATIONAL IMAGE

Trademarks may be used in non-commercial contexts to raise awareness of, or create sympathy for, charitable causes. “A charity uses and promotes its trademark to associate its cause with a unique name and/or symbol. Donors quickly recognize and associate the trademark with the cause and are assured that their donations will go to the intended charity”.³⁵ A familiar example of a charitable trademark is the red Salvation Army shield, a trademark first used in 1918 and registered in 1965.

A recent interesting phenomenon has been the practice of nations using trademarks, especially slogans and logos, to emphasize their distinctive traits for purposes of attracting tourism, investment or political favor. The slogan or logo is used to communicate the image that the country wishes to project; the image is for a nation what a brand is for a commercial

product.³⁶ It is said that a picture is worth a thousand words; certainly a strong graphical logo and a few words, repeated in international advertising, is worth a great deal in terms of tourism revenues or other anticipated benefits. Viewers of the televised coverage of the US Open Tennis Tournament, in addition to the usual display of IBM™, Nike™, Adidas™ and other logos on sports attire and backboards, were treated to frequent commercials showing the colorful ESPAÑA™ sun logo communicating the message that Spain equals sun, sport, and excitement.

EMERGING TRENDS IN TRADEMARKS

The use of trademarks reflects changes in marketing and business realities. As technology has become more of an important component of business, uses of trademarks have changed and become more complex. Three significant trends are (1) the increasing technological complexity of many products; (2) the prevalence of the Internet as a marketing and distribution channel; and (3) the emergence of branding as a global marketing and cultural phenomenon.

(1) TRADEMARKS AND THE INCREASING COMPLEXITY OF TECHNOLOGY PRODUCTS

With the increasing complexity of technology products available to the average consumer, the role of trademarks extends beyond the simple function of serving as a symbol of general associations and connotations. In contrast to the consumer of 100 years ago, today's consumers are faced with choices of staggering technical complexity as they negotiate purchases of computers, televisions, espresso-makers, audio systems, etc. The "Intel Inside™" logo may provide a certain level of comfort regarding computers, but how many consumers would think to ask who manufactures the various parts assembled in a television set? They rely on a "name" brand they believe they know.

Even some food products require technical inquiry in order to verify compliance with specifications. For example, some organic food products are in compliance with certain tests, and producers of those products are permitted to obtain a certain certification mark.³⁷ In our changing world, a turnip is not simply a turnip, whose quality is obvious to any one who enjoys eating this vegetable, but a turnip may be a tested and certified turnip, sporting a certification mark that communicates a comforting message to the consumer who prefers organic food.

Because of the trend towards complexity in the goods and services offered for sale, one of the most important emerging trends in trademarks is the expanding use of certification marks and collective marks to signal to the consumer that a product meets technical specifications and has passed certain tests. As discussed earlier in this chapter, the “certification mark” is a trademark that ordinarily is licensed by the owner of the trademark to businesses that pass technical requirements or tests or that comply with technical specifications. The trademark is often accompanied by a logo and is displayed on the product as a “prompt” or easily visible signal to the consumer. It is usually displayed as a third-party mark alongside the mark of the manufacturer/distributor of the product itself.

Trademarks showing compliance with a specification are used in a number of different ways. They are used as a sign that a product meets performance or feature standards. When the mark is conferred by a third party, the trademark may be registered as a certification mark. Sometimes, the licensor of the trademark is also the manufacturer or distributor of the product and the trademark, who also licenses the same trademark to other companies making similar or related products. For example, ColorSync™ is a registered trademark of Apple Computer that is used in connection with the distribution of computer software and hardware products to show that they use a proprietary Apple color matching software. Apple licenses out the “Made with ColorSync™” logo to other companies who are licensees of the ColorSync™ technology and make software or other products that use ColorSync™.³⁸ Thus, by this trademark licensing approach, a trademark is used to create a “family” of technologically related products offered by unrelated companies.

The effect of a trademark program for a technology platform initiative is to convey to the consumer that the product is enhanced by a technology that is both “cutting edge” and broadly accepted in the industry as a desirable technology. From the licensor’s point of view, the trademark enhances the value of the technology itself, transforming a hard-to-read technical specification into an understandable consumer concept. The technology license alone (in this case, a color-matching specification and technology), without its memorable and distinctive trademark, would not have the same value.

From the licensee’s point of view, it receives not only a useful technology to enhance its product, but also a marketing tool that is leveraged over several businesses and powered by a larger marketing program than it might be able to afford. From the consumer’s point of view, the trademark conveys in a quick, easy-to-understand, visual sign, what would otherwise be a complicated message: the fulfillment of a technical specification. An excellent example of using a trademark to create a marketing edge in a family of technical products, was the “Dolby Sound™” trademark licensing program (see Box - 5.8).

BOX-5.8 DOLBY, A SOUND HEARD ROUND THE WORLD

Dolby Laboratories, a privately held company headquartered in San Francisco in the United States of America, develops audio signal processing systems and manufactures professional equipment to implement these technologies in the motion picture, broadcasting, and music recording industries. Dolby also licenses these technologies, along with its trademark and logo, for use in the consumer electronics industry.

Beginning in the 1960s Dolby began to achieve some fame as a technology leader in sound when it pioneered the technique known as analog “noise reduction”. Dolby noise reduction works by lowering the noise when no audio signal is present while allowing strong audio signals to cover or mask the noise at other times. Dolby revolutionized tape recording in the late 1960s and early 1970s with Dolby A-type (for professional applications) and Dolby B-type (for consumer applications)

noise reduction. Later in the 1970s, Dolby revolutionized film sound with the Dolby Stereo™ analog sound system. Then in the 1980s both tape recording and film sound saw significant improvements through the use of Dolby SR™ (Spectral Recording). In the late 1980s and early 1990s Dolby came out with Dolby Surround Sound™ and Dolby Pro Logic™ for the new field of home theatre. By the 1990s Dolby applied its analog noise reduction work to digital audio technology, introducing Dolby Digital™.

According to Dolby, not just anyone can license the Dolby™ logo. Extensive technical and testing requirements must first be met. The reward for fulfillment of these requirements is "access to recognized and respected Dolby™ logos".

The effect of the Dolby trademark licensing program has been to make the reach and appeal of its name far greater than the sale of Dolby-manufactured products. The Dolby website lists stunning statistics on the number of Dolby "licensed products sold: 1,071,970,000" as of August, 2002. This figure refers only to products sold by third party licensees and does not include the large family of Dolby filmtrack and broadcasting products.

A testament to the success of Dolby licensing is that almost two-thirds of its revenues comes from licensed products.

Dolby's technological innovations are protected with patents, which will expire one day. But it is the trademark that has provided the engine for Dolby's licensing program, and the trademark, potentially, can be preserved forever. Through its trademark licensing program, Dolby parlayed its name into a trademark that is synonymous with state-of-the-art video and audio. The "Dolby Sound™" became an important mark for any consumer electronics product to be able to display. From the consumer's perspective, it became important to see the Dolby™ logo on the equipment to be purchased. The name has cachet.

Source: <http://www.dolby.com/stats/> and
<http://www.dolby.com/digital/diggen1.html>.

In the increasingly common practice of using marks to convey fulfillment of technical requirements, there are a number of variations on the general theme. A true certification mark must not be controlled by a manufacturer of the product being certified. Thus, potential users may form an association or consortium of companies that seek to promote a technology platform. The technology to be certified may have been developed by one member of the consortium, and then adopted by other members through licensing arrangements, but an independent entity must be created to bestow a certification mark. The certifying entity may also be authorized to license the technology as well as being responsible for certification testing and technical validation of the technology users.

Another variation is that the owner of the trademark may not actually manufacture any product itself. A UK technology start-up company called NXT designs slim-line loudspeakers and openly emulates Dolby's licensing model, except that at some point they determined that they would no longer manufacture any speakers themselves.

Another variation is that the certification mark may signal to potential purchasers that the product is interoperable with other products bearing the same trademark. This use of trademarks has become increasingly common in the new economy, especially in the computer business where hardware and software products must work together or risk shutting down the entire operation, yet are often developed by different companies. Without the identifying mark, the purchaser without a technical background has no way of evaluating whether a product he wishes to purchase will work with other products that he has already purchased. Thus, the trademark, in the form of a word or a logo, is a signal to the consumer not so much of the quality of the item, but that the product will work with other products of the same type. An example of this use of trademarks was the Microsoft flag logo, a very successful trademark licensing program designed to give consumers a high degree of confidence that all products bearing the "Windows™" flag will operate with each other and with the Windows™ operating system (see Box - 5.9).

BOX-5.9 MICROSOFT WINDOWS™ LOGO, FLYING THE FLAG

One of the most successful and comprehensive trademark licensing and certification programs has been Microsoft's "flag" logo program. Microsoft designed a colorful and distinctive logo, a multicolored waving flag, and licensed it to developers who designed programs that worked with Microsoft software products. In order to display the flag, developers were required to sign a trademark license agreement. The license agreement required the licensees to comply with various requirements, including technical requirements relating to interoperability and functionality. To verify compliance with these requirements, Microsoft required the licensees to undergo a certification process. Currently, as Microsoft is introducing its new operating system, XP, a new trademark licensing and certification program is underway. Through a strategic use of trademarks, Microsoft not only promotes its brand by having licensee's display the logo, but also confers a benefit on the licensee by enabling it to demonstrate its relationship to Microsoft products. The logo program also promotes the broad Microsoft platform, creating a conspicuous Microsoft "family" of products that suggests to users a comprehensive product offering a high level of organization and integration.

Trademarks may also be used by a developer of auxiliary products that work compatibly with products distributed by the licensor. The developer, in order to display the trademark, is required to design and manufacture its product in compliance with a specification, which compliance is then tested by the licensor or its agent. The trademark owner is the owner of the flagship product and, by use of the mark, becomes the leader of a fleet of auxiliary products that work well with its product. Thus, trademarks may serve an important economic function of promoting interoperable technical systems, and at the same time, facilitate consumer choice.

(2) THE RISE OF THE INTERNET AND ITS EFFECTS ON TRADEMARKS

In addition to the increasing technological complexity of trademarked products, another trend affecting trademarks has been the rise of the Internet. In the short space of ten years, the Internet has transformed the sale of goods and services, as well as many other areas of life. Trademarks and trademark law have been profoundly affected.

Marks are essential in e-commerce. Enterprises need to build recognition and goodwill and inspire confidence in themselves and their brands. Consumers rely heavily on marks as a means of identifying suppliers of products and services, particularly when operating in virtual markets in which face-to-face interactions are infrequent and there is little or no opportunity to inspect goods or services before purchasing them. In some respects, a mark used on the Internet may have broader impact and possibly greater value than in the physical world, as it is visible to a potentially global public and might be considered to have a global reach.³⁹

With the development of e-commerce, the number of applications sent to trademark offices for marks intended to be used on or in connection with the Internet dramatically increased in some countries. For example, in 1999, the USPTO received 33,731 applications for marks that covered an Internet-related product or service. Five years earlier, it had received only 307. In 1999, 12,000 trademark applications included the “.com” suffix. In 1994, a mere 4 had this suffix.⁴⁰

Owners of trademarks used in e-commerce are placed under considerable strain when confronted with the challenges of the Internet. One area of conflict stems from the relationship between marks and domain names. Domain names are a simple form of Internet address, designed to enable users to access locations on the Internet easily. Domain names have become valuable in their own right as unique identifiers, akin to marks, showing the Internet address, but also often capitalizing on the brand strategy of the owner of the website. Their value is heightened because there is only one spot for each word as a domain name in a particular address. For example, there can be only one ABC.com; even if

there is another ABC brand for a different product, there is simply no alternate spot for the ABC brand as a domain name on the .com domain.

The relationship between marks and domain names raises numerous complex issues. For example, what happens when a party seeks to register a domain name that is identical or similar to a mark? One form of violation of the rights of the owner or owners of a registered mark that has emerged on the Internet, involves the intentional registration of domain names similar or identical to marks that are owned by another party, in an attempt to extract payment from that party. This practice has come to be known as cybersquatting (see Box - 5.10). In response to this particular issue, WIPO has developed the Uniform Dispute Resolution Policy (UDRP) which provides an administrative proceeding and remedy against cybersquatting.

BOX-5.10 NANDO'S: A SOUTH AFRICAN SUCCESS STORY

In the heart of the local Portuguese community in Johannesburg, chicken was prepared according to a well-kept secret recipe. When Fernando Duarte introduced his friend Robert Brozin to the dish, the latter had his first taste of what was to become his dream – the dream of sharing something this good with the rest of the world. The two men became partners, and in September 1987, Nando's was born. Today, Nando's is a fast-growing restaurant chain with over 200 outlets across Africa, Australia, Canada, Egypt, Israel, Malaysia, Saudi Arabia, and the United Kingdom. The company has developed considerable international reputation and goodwill in its Nando's™ mark, which is readily and distinctively associated with its fast-food chicken outlets around the world, so much so that it now owns an extensive international portfolio of registered trademarks surrounding the word Nando's™.

Nando's was listed on the Johannesburg Stock Exchange in 1997. In October 2000, the group was ranked as South Africa's eleventh most global company in a survey conducted by PriceWaterhouseCoopers, providing clear recognition of the stature and presence that the Nando's™ brand has achieved in the international arena. The strength

of the Nando's™ brand has also allowed the company to diversify into other sectors, which include Nando's™-branded retail products and merchandise. "We're probably one of the biggest non-American global brands in quick-service restaurants. A lot of South African companies have bought global brands, but no one has taken a South African brand and gone out to trade in the high street. That's what we're trying to do," said Mr. Brozin.

In March 2000, Nando's filed a cybersquatting case with the WIPO Arbitration and Mediation Center under the Uniform Dispute Resolution Policy (UDRP) applicable to generic top-level domains adopted by the Internet Corporation for Assigned Names and Numbers (ICANN). The respondent, had registered the domain names *nandos.com* and *nandoschicken.com* and offered to license or sell them back to Nando's. The administrative panel found the case in favor of Nando's and ordered the Registrar to transfer the domain names to the company.

Sources: Nando's International Limited and the Financial Times (London).

The global nature of domain name registration raises another type of issue arising from the territoriality of trademark registration. The Internet is global in scope, whereas trademark law is national, so that the same mark registered in different countries by different parties may compete for the same unique spot as a domain name. For example, the mark "ABC" registered in the UK may have a different owner and a different secondary meaning than the same mark registered in Singapore, and both owners could come into conflict if they seek registration of "ABC.com" as a domain name in the same Internet domain space.

Still another set of issues relates to the kinds of identifiers, other than trademarks, that should be protected in the domain name context. For example, the use of personal names, geographical indications of source, geographical terms, trade names, names of international organizations, and names of international nonproprietary pharmaceutical substances are the subject of the Report of the Second WIPO Domain Name Process.⁴¹ The Report explores the issues related to the use in the domain name system of these types of names that act as identifiers, in some respects, like trademarks.

These issues are compounded by the fact that there are now numerous generic top level domains (gTLD), approved by ICANN (among others, .com, .org., and .net; and new ones such as .aero, .info, .pro, .coop, .name, .museum, and .biz). In addition, there are country code top-level domains (ccTLD), such as .mx for Mexico. Recent technical developments adding further complexity to the issue are the creation of non-roman character domain names (for example, in Arabic, Chinese, or Hebrew) and the development of a parallel set of new top-level domains outside the aegis of ICANN.

From the perspective of the trademark owner, each new domain poses a challenge for enforcement because each domain has a potentially different set of protection measures against misuse of trademarks and a different enforcement system. Great strides have been made by WIPO in terms of encouraging application of the Uniform Dispute Resolution Policy by ccTLDs and gTLDs worldwide.

(3) EMERGENCE OF BRANDING AS A GLOBAL MARKETING AND CULTURAL PHENOMENON

The preceding section of this chapter has identified two emerging trends in trademarks, the increase in technological complexity and the rise of the Internet. A third emerging trend is the use of trademarks as cultural icons. Critical commentators point out that increasingly, customers choose a product because its brand seems to represent a way of life or a set of ideas.⁴² The argument is made that companies today do not create value in their products, but in their brands; they are not marketing products but images. Indeed, it is argued, the brand is now more valuable and more important both to the consumer and to the shareholders of the brandowner than the product it is ostensibly designed to promote. As one marketing executive explained:

Nike, for example, is leveraging the deep emotional connection that people have with sports and fitness. With Starbucks, we see how coffee has woven itself into the fabric of people's lives, and that's our opportunity for emotional leverage. A great brand raises the bar – it adds a greater sense of purpose to the experience,

whether it's the challenge to do your best in sports and fitness or the affirmation that the cup of coffee you're drinking really matters.⁴³

The consequences of this trend toward enlargement of the brand concept are difficult to assess, however, it has been observed that the greater the expectation for the brand in terms of emotions, the greater the vulnerability of the brand to factors extrinsic to the product qualities and performance. The public may judge the brand and the corporation on the totality of its image, not just whether the product is good or has attributes that the consumer wants. "The more companies promote the value of their brands, the more they will need to seem ethically robust and environmentally pure."⁴⁴ To protect these valuable but vulnerable brands and the established reputation and corporate image they project, the conduct of a company is supposed to meet consumers' expectations for the company's correctness with regard to politics, ethics, environment and contribution to civil society. Thus, brand owners may find themselves under increasing pressure to invest in corporate activities that support their valuable brands but that are not directly related to the qualities or functions of the products they sell.

GEOGRAPHICAL INDICATIONS⁴⁵

A geographical indication, like a trademark, communicates a message. It tells potential buyers that a product is produced in a particular place and has certain desirable characteristics that are only found in that place. A legally recognized geographical indication has the effect of giving the regional or local producers an exclusive right to use the indication in the countries which are bound by the relevant bilateral, regional and multi-lateral agreements (e.g. tea producers in other parts of the world may not use the term "Darjeeling" to describe their tea, even if the tea has similar taste).

When considering geographical indications as a category of intellectual property, it is important to distinguish them from trademarks: whereas a trademark identifies the enterprise which offers certain products or services on the market, a geographical indication identifies a geographical area to which a quality, reputation or other characteristic of a product is

essentially attributable. However, geographical indications are similar to trademarks in their concept and effect, and can be used to promote national and regional economic development, and are also used strategically by businesses to promote their products.

So, a lover of fine cheeses will look for Roquefort made in the region around Roquefort in France. The use of the term Roquefort by non-French cheese makers would be illegal in most countries.⁴⁶ An aficionado of Vietnamese food will look for the real fish sauce, from Viet Nam, Phu Quoc fish sauce, and he can accompany his authentic meal with Vietnamese Shan Tuyet Moc Chau tea (see Box - 5.11).

BOX-5.11 FISH SAUCE FROM VIET NAM

Phu Quoc fish sauce and Shan Tuyet Moc Chau tea recently became the first products from Viet Nam whose appellations of origin are recognized worldwide. Phu Quoc Island off mainland Kien Giang Province in the Mekong Delta is famous for a variety of fish sauce products, so the term "Phu Quoc" is often referred to as fish sauce in the country, especially in the southern provinces. Shan Tuyet Moc Chau tea is produced in Moc Chau in the northern mountainous province of Son La.

In June 2001, a ceremony took place in Hanoi to announce the appellations of origin as well as Viet Nam's decision to renew a cooperation program for geographical indications and prevention of trade fraud with France. The Vietnamese Deputy Minister recognized the strategic and developmental importance of these products and their new legal status: "This [recognition] will pave the way for us to promote the protection of appellations of origin of Vietnamese goods on the world market."

Source: The Saigon Times Daily; Ho Chi Minh City; June 7, 2001.

A legally protectable geographical indication denotes a quality link between the product and its area of production.⁴⁷ Agricultural products typically have such qualities that derive from their place of production and are influenced by specific local factors, such as climate and soil.

By contrast, designations that are simply descriptive statements of where a product is from, without a quality link between the location and the product, are considered generic and not legally protected. Dijon mustard is a term that is now considered generic because over time it was produced by so many non-Dijonnais that it came to be associated with a type of mustard rather than a place. Whether a term is generic is determined by national law, so this area has given rise to a number of differences in approach.

Several types of protection are used for geographical indications, which include (1) *sui generis* legislation or decrees, (2) a register of indications, and (3) laws against unfair competition or the tort of "passing off". In the last category, to use a geographical indication for a product that does not originate in the specified region may be considered an unfair trade practice. Geographical indications are also protected by the registration of collective marks or certification marks.

Strategically, geographical indications have many of the same powerful business effects that trademarks do. Regional specialties may have their stature enhanced in the eyes of the consumer when a regional collective and its members enjoy the exclusive right to use the particular geographical indication. This is especially true of gourmet food products but the same principle can be applied to herbs, woods, costumes, rugs, and various other products. Like trademarks, geographical indications may add dynamic marketing power to a product, especially when the quality for which a region is famous is actually supported by user experience over time. Because geographical indications are inherently collectively owned (all cheese makers in Roquefort region are the actual "owners"), they are an excellent tool for regional or community-based economic development. Any region that has a specialty associated with it, where a quality link exists or can be established between the product and the region, should consider the advantages of using a geographical indication to distinguish its products from lower-quality, non-regional competitors.

Australia's experience with wine is a good example of strategic use of geographical indications to enhance a local industry. Australian wines have, in the last 10 to 15 years, become popular and gained a reputation for high quality and good taste. This recognition led Australia to conclude the Australia/European Community Wine Agreement, as well as enacting domestic implementing legislation, providing protection for geographical indications. The Australian wine industry has benefited from the recognition of geographical indications: one wine company used "icon marketing," branding, and the Australian wine indication to help increase wine importation to the United Kingdom from 5,000 cases in 1986 to 1 million cases in 1994, and in 1995 claimed to be the top selling wine brand in the United Kingdom, surpassing even French and California wines.⁴⁶ The story of Tequila in Mexico is another success story for geographical indications (see Box - 5.12).

**BOX-5.12 TEQUILA:
ONLY WHERE THE AGAVE GROWS**

Tequila, a Mexican drink, has acquired a distinct identity, often enhanced by bottle designs featuring some of Mexico's characteristic symbols. What few people know, however, is that tequila has been protected as a geographical indication since 1977, and is produced only within a delimited area in Mexico where its primary raw material, the cactus-like agave plant, grows. The Presidential Decree establishing tequila as a geographical indication was published on October 13, 1977, and referred to four Mexican states (later extended to five) which held the exclusive right to produce the beverage.

The protection of tequila enabled its producers to market their product worldwide and ensure that no other product made with alternative ingredients could be marketed as tequila. Today, over 190 million liters of tequila are produced annually and sold worldwide, with an 83 percent increase over the last five years. Tequila, moreover, gives direct employment to over 36,000 Mexicans, including agricultural workers, technicians, and other workers, as well as indirect employment to many more in transportation, distribution, and other related activities.

In 1978, tequila was registered under the Lisbon Agreement administered by WIPO, thus establishing its international status. The sale of tequila has been further enhanced as a result of this registration and the Mutual Recognition Agreement signed between Mexico and the European Union for the reciprocal recognition of geographical indications in 1998, because producers were able to guarantee the quality of the product and they could avoid the name being used for products made with different ingredients which could taint the reputation of the original Mexican product and deceive customers. The protection meant that tequila production became an exclusive right of Mexican producers and the reputation of the product could be enhanced via a joint effort among all tequila producers who had a common interest in making the product renowned worldwide.

Source: Tequila Regulatory Council.

This chapter has demonstrated that trademarks and geographical indications are more than mere names; for a number of reasons they are more important financially and culturally today than ever before. They are powerful tools that are used strategically by businesses and nations in many different ways, as described in the first section of this chapter. The uses of trademarks and geographical indications have changed and expanded as society, products, and technologies have become more complex.

Furthermore, the market in which trademarks function today is international because the liberalization of economies worldwide has globalized market competition. This development has resulted in an increase in the number of companies competing in global markets with similar products. This has led to growth in the importance of marks and geographical indications as strategic tools in penetrating markets and that may confer both macro-economic and micro-economic benefits.

At such an important time for marks and geographical indications, the emergence of new technologies, especially the Internet, has brought problems and provided unprecedented opportunities for those keen on brand-making. The situation has also highlighted the weaknesses of the traditional territorially administered rights system, and the need, as well as the capability, to transcend traditional boundaries through new technologies on the part of the enterprise sector. The enforcement of trademark rights and related issues are discussed in Chapter 9.

- 1 As Justice Felix Frankfurter stated: "The protection of trademarks is the law's recognition of the psychological function of symbols. If it is true that we live by symbols, it is no less true that we purchase goods by them". **Mishawaka Rubber & Woolen Mfg. Co. v. S.S. KresgeCo.**, 316 U.S. 203, 205 (1942).
- 2 For article on the Dove™ brand, see "The Making (or Possible Breaking) of a Megabrand", **New York Times**, July 22, 2001.
- 3 In this book, for ease of use, when referring to trademarks, we include service marks.
- 4 See for discussion of color, color combinations, sounds, and fragrances as trademarks, Adam L. Brookman, **Trademark Law: Protection, Enforcement and Licensing**, (Panel Publishing, 1999): sections 2.01[D-G].
- 5 Robert P. Merges, Peter S. Menell, and Mark A. Lemley, **Intellectual Property in the New Technological Age**, 2nd ed. (Gaithersburg, MD: Aspen Publications, 2000): 563.
- 6 Merges: 557 et seq.
- 7 William M. Landes and Richard A. Posner, "The Economics of Trademark Law," **The Trademark Reporter** 78 (May-June 1988): 270-271.
- 8 *Id.*: 270-277.
- 9 A classic example of such marketing using trademarks is the KODAK INSTAMATIC™, a successful camera trademark that signaled ease of use and automaticity. See "What High-Tech Managers Need to Know About Brands", **Harvard Business Review**, July-August, 1999: 91.
- 10 See Merges: 561 quoting Joan Robinson, **The Economics of Imperfect Competition** (1933).
- 11 See discussion in Merges: 559-563.
- 12 See the recent provocative work by Naomi Klein, *No Logo*, Flamingo Press, 2001; see also Peter van Ham, "The Rise of the Brand State", **Foreign Affairs**, September/October 2001.

- 13 See, e.g. Scott Ward, *Larry Light and Jonathan Goldstine*, "What High Tech Managers Need to Know about Brands", **Harvard Business Review**, July-August, 1999; Nicholas S. Economides, "The Economics of Trademarks", 78 **Trademark Review**: 523; Stigler, Georges, "The Economics of Information", 69 **J. Pol.Econ.**: 213 (1961) (cited in *Merges*: 561).
- 14 See J. Thomas McCarthy, **McCarthy on Trademarks and Unfair Competition**, §3.1 (4th Ed. 1998) discussing role of trademarks in preventing public deception.
- 15 William M. Landes and Richard A. Posner, "The Economics of Trademark Law," **The Trademark Reporter** 78 (May-June 1988): 270-271.
- 16 Interview with R. Gopalakrishnan, Director, Tata Sons, Limited, www.tata.com/0_people/interviews/20000729_r_gopalakrishnan.htm
- 17 Jack H. Hirshleifer, "Where Are We in the Theory of Information?" **American Economic Review** 63 (2): 31-39.
- 18 Benjamin Klein and Keith Leffler, "The Role of Market Forces in Assuring Contractual Performance," **Journal of Political Economy**, 89(4),1981: 615-641).
- 19 Aaker, David A., **Building Strong Brands**, (New York: The Free Press, 1996): 22.
- 20 *Ibid.*: 2-7.
- 21 *Ibid.*: 562-564.
- 22 <http://www.asahibeer.co.jp/english/company-e/superdry>
- 23 For discussion of living up to the brand promise, see "What High Tech Managers Need to Know about Brands" **Harvard Business Review**, July-August, 1999: 92-93.
- 24 David A. Aaker, **Managing Brand Equity: Capitalizing on the Value of a Brand Name**, New York: The Free Press, 1991); Chiranjeev Kohli and Mrugank Thakor, "Branding Consumer Goods: Insights from Theory and Practice," **Journal of Consumer Marketing** 14, No. 3 (Spring 1997): 206.
- 25 "The Making (or Possible Breaking) of a Megabrand", **New York Times**, July 22, 2001, discussing the difficulties inherent in extending an established brand to a new product.

- 26 Thomas S. Wurster, "The Leading Brands: 1925-1985," **Perspectives**, Boston Consulting Group 1987. Also, Kohli, "Branding Consumer Goods."
- 27 http://www.interbrand.com/features_effect.asp?id=50
- 28 Stephen A. Degnan and Brian Napper, "Trade, Service, Persona Marks Get Big Royalties," **LES Nouvelles** 34, No. 3 (1999): 125-128.
- 29 "The Harry Potter Phenomenon", Interview with Nils V Montan, President of International Trademark Association, **Managing Intellectual Property**, April 2001: 18 et seq.
- 30 *Ibid.*: 126.
- 31 See e.g. http://www.arm.com/armwww.ns4/html/semicon_partners; or <http://www.intel.com/eBusiness/affiliates/index.htm?iid=ebus+homeWW3303&>
- 32 Kohli, "Branding Consumer Goods."
- 33 David A. Aaker and Alexander L. Beil, *Brand Equity and Advertising*, Kohli, "Branding Consumer Goods."
- 34 An illustrative explanation of various certification marks and how they may be used on electrical appliances may be found at the Underwriters Laboratory website: <http://www.ul.com/mark/index.html>.
- 35 *Century of American Innovation*, **US Patent and Trademark Office Review**, 1999: 18.
- 36 See interesting discussion in Peter van Ham, "The Rise of the Brand State", **Foreign Affairs**, September/October, 2001: 2 et seq. The author claims that we live in an age where "brands and states often merge in the minds of the global consumer", and where states distinguish themselves by creating a brand in order to attract foreign investment: "Smart states are building their brands around reputations and attitudes in the same way smart companies do".
- 37 See e.g. California Certified Organic Farmers Organization which certifies organic produce based on inspection and testing and confers a logo to producers that pass the test. See, <http://www.ccof.org/certification.htm> which details the "seven steps to certification" and offers certified companies "the most recognized seal in the organic industry".

- 38 See ColorSync license and documentation at www.Apple.com/ColorSync.
- 39 For further details, see the WIPO e-commerce primer at <http://ecommerce.wipo.int/primer/section3.html>
- 40 "A Flood of Trademark Applications Clearly Shows That the Internet is a Place Businesses Want To Be," *New York Times* (May 15, 2000).
- 41 See <http://wipo2.wipo.int/process2/>
- 42 Naomi Klein, *No Logo, Flamingo*, 2000.
- 43 Scott Bedbury, Vice President of Marketing at Starbucks and former head of marketing at Nike, quoted in Klein, *No Logo*: 21.
- 44 "Pro Logo: Why Brands are Good for You," *The Economist*, September 8, 2001.
- 45 The expression "geographical indications" is used in this book to cover also appellations of origin (such as wine labels) and indications of source, all of which have different legal meanings. Geographical indications have, in the TRIPS Agreement, a specific, narrow meaning.
- 46 "Roquefort" for cheese produced in France is protected in the European Union under Regulation (EC) No. 2081/92. Geographical indications are recognized in European Community Council Regulation No. 2081/92, July 14, 1992 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foodstuffs, as well as in Articles 22-24 of the TRIPS Agreement. See also the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration.
- 47 WIPO Intellectual Property Handbook, 2001, §2.675.
- 48 See WIPO Symposium on the International Protection of Geographical Indications, co-sponsored with the Government of Australia, April 5-6, 1995, WIPO Publication No. 739(E).

CHAPTER 6

COPYRIGHT AND THE CULTURAL AND INFORMATION INDUSTRIES

Copyright is the area of the law that provides protection to “original works of authorship” including paintings, sculpture, music, novels, poems, plays, architecture, dance, instruction manuals, technical documentation, and software, among other items. Legal protection flows from the fact that an author independently creates the work and that his or her “expression” of an idea is original, rather than copied from another person. Copyright has a different standard than the novelty standard in patents, which focuses on the newness of a useful idea or concept, not the expression of that idea. Unlike inventions, works of authorship need not be useful. Copyright extends only to the expressions of ideas and concepts, and not to the ideas or concepts themselves. The difference between copyright and patent is referred to as “the idea-expression dichotomy”.¹ The famous example is that Shakespeare’s play *Romeo and Juliet* was a creative expression, a work protected by copyright (had such a doctrine existed at the time), but that all stories about young men and women falling in love despite family and caste obstacles would not have infringed that play.

There is no rigid definition of works which fall under copyright. Rather, it is said to extend to all “literary and artistic works” and it is intended that a flexible standard exist. In practice, copyright protection has been extended to works that the lay person might consider neither literary nor artistic, such as computer software or technical documentation.

Copyright protection may subsist in the same product or technology with other forms of intellectual property; for example, an invention related to computer software may be protected by patent law, and at the same time, the software code may be protected by copyright. Similarly, copyright may protect a work of art that is also protected as an industrial design, and copyright may protect a written text that is also a trade secret.

In some countries, in order to qualify for copyright protection works must be fixed, so another person can perceive them in a sufficiently stable or permanent form. However, copyright protection occurs without any special registration, deposit, or other bureaucratic requirement; upon creation or fixation of the expression, the rights of copyright automatically protect the work. It has been agreed inter-

nationally for many years that nations may not require "formalities" for the use and enjoyment of copyright.²

In 1961, with the Rome Convention, new categories of rights, which were not previously protected by copyright, were created. These new rights were referred to as "neighboring rights", and they included broadcasts, phonograms, and performances.³ With the adoption of the TRIPS Agreement, the term neighboring rights has been largely supplanted by the term "related rights" although both terms are still used.

THE CULTURAL INDUSTRIES

Activities and industries whose basic strength is rooted in the protection of their primary products and services through the laws of copyright and related rights, are often referred to as cultural industries.⁴ However, the term is too narrow, as computer programs are also protected by copyright.

It is said that the most cultural aspect of any person is the language spoken by that person. Dress, activities, spiritual practices, diet, and so forth, can also be cultural indicators; however, nothing so quickly says "culture" as language. When language is written down; woven into music; adapted into audiovisual productions; or used in conjunction with computers, works to be protected under the laws of copyright are often created. When sustained, commercially driven, and strategically organized, these activities are grouped into businesses and categorized into industries which provide products and services to satisfy our cultural needs and desires, as well as many other pleasures, requirements, advantages, and accessories.

This chapter will visit each of the cultural industries, discuss its characteristic features and activities, and thereby highlight the relationship between these culturally rich and dynamic activities, and copyright and related rights protection. As used here, the term "industry" is construed as covering not only the enterprises in a certain activity or business, but also the many individual creators, authors, artists, and performers who take part in commercial cultural activities both worldwide and locally, and the communities that they have come to constitute.

The industries which comprise the business of copyright are most logically distinguished and categorized as follows: music, audiovisual, art, architecture, literary, information technology, interactive entertainment and education. This grouping mostly corresponds to the different categories of copyright and related rights works, but, more importantly, it reflects the reality that certain activities and products are germane to specific industry practices and to certain products and services. The ultimate products and services, then, are the bases of the categories.

Creativity and innovation are at the heart and soul of the copyright industries. The power of the products and services they produce is undeniable. Almost every person has had his or her life changed by a book. Almost every person has laughed or cried because of a movie. Graphic artists and sculptors move us to see the beauty in life. Computers and computer software make our work easier, give us the ability to communicate globally, and allow us to have access to unlimited amounts of information and knowledge.

TABLE-6.1 TOP SIX CATEGORIES OF UNITED STATES INDUSTRIES ON THE FOREIGN SALES AND EXPORT LIST (1999)

Rank	Industry
1	core copyright industries
2	chemicals
3	motor vehicles
4	aircraft manufacturing
5	agricultural products
6	electronic components and accessories

Source: *Economists Incorporated, Copyright Industries in the U.S. Economy: The 2000 Report* (Washington, D.C.: International Intellectual Property Alliance, 2000).

To get an idea of the size of the copyright industries, a few statistics are presented (see Table - 6.1 and Chart - 6.2). Looking at the US figures, for the year 1999, the core copyright industries contributed an estimated US\$457.2 billion to the economy, representing approximately 4.94 percent of GDP. During the period from 1977 to 1999, employment in the

core copyright industries grew from 1.6 percent of the workforce (1.5 million workers), to 3.24 percent of the workforce (4.3 million workers). In terms of foreign sales and exports, the core copyright industries accounted for at least US\$79.65 billion in 1999.⁵ Statistics from other countries mirror the above. In New Zealand, copyright industries increased their proportion of GDP between 1987 and 1994 from 3.1 percent to 3.4 percent.⁶ In Uruguay, copyright industries accounted for 2.9 percent of GDP.⁷ In Singapore, it was 2.7 percent.⁸

CHART-6.2 CONTRIBUTION OF COPYRIGHT INDUSTRIES TO GDP (PERCENT)



UNIVERSALITY OF MUSIC

Music is the most universal, the most accessible, and the most widespread, from a global perspective, of all of the copyright-related industries. Music is employed as an important element in other media, such as motion pictures, videos, and interactive software products. It plays a large role in the success of television, and is the chief product offered by radio. The business of music is widespread, lucrative (but not evenly so), and cultural. No country in the world lacks some form of music, and almost all countries create multiple forms and styles.

The next sections will describe how a copyright framework functions to protect contributors, looking at each level of the business model in which music travels from the mind of a musician or songwriter to the ear of a consumer.

MUSICAL COMPOSITIONS

The entire process underlying the business model of the music industry starts with a song, or more accurately, a musical composition. The songwriter (a term which generally applies to one who creates a song with both lyrics and music) and the composer (a term which generally applies to one who creates a song with only music) are the owner(s) of all rights of copyright in the musical composition at the point of fixation,⁹ when the songwriter physically fixes his or her idea, either in musical notes, or by using analog or digital recording capacities. Upon creation or fixation, depending on national legislation, copyright protection automatically comes into force without further formalities.

Musical compositions, when grouped in large numbers, constitute musical catalogues. To preserve, exploit, and commercialize musical catalogues, music publishing companies are formed. Facilitated by the property aspects of the IP system, catalogues are bought and sold daily; they are rich assets whose value is determined by historical and projected cash flows and earnings. The value can change dramatically overnight, literally, on account of one hit recording by one artist or group. As a good example, "Macarena", a global hit by the Spanish group Los Del Rios, sold millions of copies and changed that group's catalogue from an afterthought into an asset with financial value.¹⁰

The renewable (sustainable) nature of intellectual property, and the creative uses to which it can be put, can be seen quite clearly using the example of musical compositions in a catalogue (see Box - 6.3). Musical compositions can be re-recorded by any number of performers, thereby increasing the inherent value of the underlying asset (the musical composition). The whole process is made possible by the copyright and related rights laws, which empower the right holders, through the rights of reproduction, public performance, distribution, and communication to the public.

BOX-6.3 BOWIE BONDS

The renowned British performer David Bowie, over the course of his 30-year plus career, has written hundreds of musical compositions, as well as performing and recording them. From his recordings of those compositions, and from cover versions by other artists, an income stream has been produced, and with a measured certainty, will continue on into the future. A creative brokerage organization, The Pullman Group, saw an opportunity to "securitize" the musical compositions as an income-producing asset. It licensed Bowie's rights to his musical compositions for US\$55 million, which it paid to him. It then sold bonds to investors on the basis of a repayment and profit model using the income from the musical compositions as both the security for the investment and the source of the repayment.

This is, thus far, a win-win-win situation. Bowie received present income based on many years of projected royalties. The Pullman Group received fees and will receive profits from its creative business model. The investors will receive interest on their investment much higher than normal interest rates. The whole transaction is securitized by proven IP assets in a most creative way. There are plans under way to create and issue similar bonds to investors using other music catalogues, such as those of Marvin Gaye, Holland-Dozier-Holland, and James Brown. The business model of the security bonds can also be applied to drug patents deriving from the current research in human genomics. These events point to the virtually limitless possibilities embodied in the creative use of intellectual property (music, in this particular example).

Source: <http://www.pullmanco.com/article136.htm>; Global Finance, November 1999: 66-67

QUALITY RECORDINGS

The next level in the business model of the music industry is for musical compositions to be recorded. Though musical compositions can be delivered or disseminated in their live state, for example, via concerts and dances, the more prevalent form for their diffusion and distribution

is as recorded music, usually in the form of music cassettes, compact discs (CDs), and newly emerging technologies, for example, MP3-bearing objects, such as the Diamond Rio Player. Over the last few years, the prevalent format for recorded music has been the CD, which accounts for approximately 65 percent of all recorded music sales.¹¹

The process of recording musical compositions necessarily involves performers, thus rendering a recording of their performances. Copyright and related rights laws facilitate the recording process, and aim to protect all of those whose participation in the recording process is crucial to its success. Musicians and singers literally create the recording, along with sound engineers, editors, and producers. As such, the law recognizes that they have an ownership interest in the final recording, in the same way that those who create a musical composition have an ownership interest in the final composition. It is because of this that recording companies (see next section) rely so heavily on contracts with performers both to secure a transfer of rights and to secure the recording companies' position in order to recoup their often heavy investments in these recording projects. The whole process of creativity and participation by the songwriters and composers, musicians and singers, the investment of the recording companies, and the final delivery of the finished product to the public is dependent on the laws of copyright and related rights.

With new recording technologies, music can be recorded literally anywhere, from a small hand-held device all the way up to state-of-the-art recording studios with hundreds of separate channels designed to capture sound as accurately as is scientifically possible. If the highest possible quality of sound is to be achieved, however, the recording phase requires professionals with specific knowledge of this technical process. It is a profession which has applicability in other media (for example, in radio and television, at live concerts, and in discos). Mixing a recording is sometimes a separate skill from those possessed by the engineers and producers, as is preparing the final product so that it can be manufactured into cassettes and CDs. Each one of these positions or functions represents separate jobs, skills, and employment opportunities in the economic development sphere.

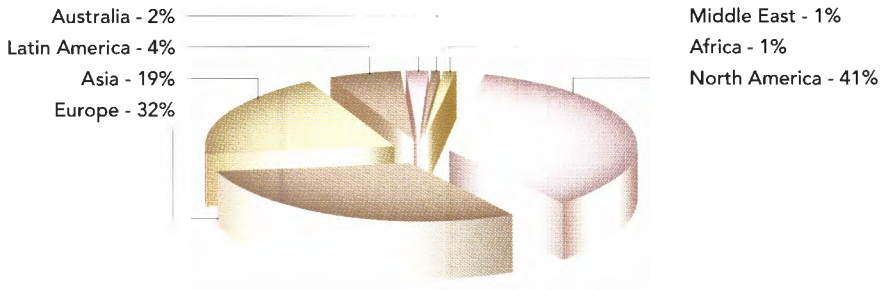
THE BUSINESS OF DISTRIBUTION OF RECORDED MUSIC

Once a recording of a musical composition has been achieved, the most visible aspect of the global music business model comes into play. The distribution of recorded music is dominated by five multinational enterprises whose interests also extend to many areas, products, and services other than music: AOL/Time-Warner, Sony, Bertelsmann, EMI, and Vivendi Universal.¹² While estimates of the distribution market share by these five companies vary somewhat, and while independent record producers do exist in many countries of the world, it can be said that the five companies mentioned above control somewhere around 80 percent of all sales of recorded music.¹³

The global music business is promoted by extensive marketing. Potential customers of recorded music are bombarded daily with music: in cars, in elevators, on radio and television, in shops and restaurants, and at live events. Getting a customer to the point where he or she feels it is necessary to purchase the CD or cassette of a favorite artist is a process which requires enormous financial, human, and creative resources. The major recording companies spend millions of dollars on promotion, both for new artists and for well-known ones. Campaigns are often centered around events (such as concert tours or musical, sporting, or television events) which attract upwards of a million people. This large-scale promotion and allocation of resources would not take place without the certainty that, if there are to be financial rewards, those who have been creatively and financially responsible for making that happen will be the first in line to both recoup the investment and be rewarded for the efforts.

In 2001, the global music market was worth US\$33.7 billion.¹⁴ North America, Europe, and Japan (83 percent of the Asian market) were the leaders (see Chart - 6.4). The figures in this chart are limited to sales of recorded music.¹⁵

CHART-6.4 GLOBAL RECORD INDUSTRY SALES – 2001



Source: International Federation of the Phonographic Industry (IFPI)

The multinational recording companies are vitally concerned with the discovery, nurturing, development, exposure, and commercialization of new talent, new songwriters, new singers, new musicians, new groups, and new music. This process is ultimately their lifeblood, and one way they can secure their future is to keep a constant and large flow of new talent moving through their systems. The more accurate they are in recognizing commercially viable talent, the more successful they will be in terms of profits and losses. It is axiomatic that their chances are increased by having a larger pool of talent to choose from, not a smaller pool. They are all diligently searching for the next “Macarena”.

The other side of this process is the fact that small and niche markets have been overlooked, or at least not emphasized, as the large companies target the biggest markets with the most common tastes to secure the greatest opportunities for profit. As shown in Chart - 6.4, the sales of recorded music in Latin America, the Middle East, and Africa indicate that there will be significant market potential in these regions.

With the level of investment for some aspects of the music business increasingly being lowered by the advent of the Internet as a new promotion and distribution medium for recorded music, as well as for the promotion of new and less well-known musicians, small recording companies and musicians should be able to find unprecedented opportuni-

ties for marketing their products and themselves (see the last section of this chapter). These small recording companies could also succeed in reaching out to potential customers by discovering and featuring diversified regional and local music and talented musicians hidden in their communities. If copyright laws are effectively used to provide business stimulation for composers, musicians, and recording companies in the local community, niche and indigenous music could surely expand, as there is clearly a market for almost all types of music. The next section will discuss the high potential of indigenous music for industry, composers, and musicians.

WORLD MUSIC, LOCAL MUSIC

“World music” is an interesting term.¹⁶ Some see it as describing any music that is outside of the mainstream of “Western music”, a catchall phrase, which attempts to avoid differences and cultural aspects so important to non-Western music and its musicians.¹⁷ Some would say that world music has now become mainstream, enthusiastically marketed by established record companies. However defined, world music is popular today and presents an opportunity for regional and local musicians worldwide to commercially exploit their talent and their musical traditions.

Because many people prefer their own music, there is a very clear opening for entrepreneurial efforts to attract indigenous, national, and regional populations and cultures. There are local, national, and regional players and enterprises who have stepped into this vacuum, and who provide music products and services to a potentially global market. Depending on the cost of production, talent, and distribution, small runs of locally desirable music can now be profitable. Indeed, with the advent of the new technologies in this field, the possibility becomes more real that every musician and musical group can serve as their own record company; every songwriter can serve as his or her own publisher; and those who are not so directly involved with the creation side of the music, such as the recording studio and the production company, can also fulfill important roles. (See Chapter 7 for discussions on the protection of folklore).

There are many success stories of talented people who were overlooked by the multinationals, or who were deemed to be too cultural, too regional, or too “niche” for the common-denominator approach. Los Del Rios sprang onto the world stage with a massive hit. Other examples abound, such as Cuban music, which has gone mainstream. Global success has been achieved by Gloria Estefan (who has sold over 45 million records¹⁸) and the Buena Vista Social Club. Puerto Rican Ricky Martin is a worldwide phenomenon, combining the rhythms of Latin American music with English lyrics. The same can be said for the American singer/performer Christina Aguilera, who will cross back over from English into Spanish lyrics for her millions of Spanish-speaking fans.

With the greatly heightened awareness provided by the Internet and enhanced telecommunications services, the demand for world music is increasing. The *rai* music of North Africa has existed for years and one of its best known proponents, Chebb Mami of Algeria, has been achieving growing regional success. Since his participation in a recording with the well-known British performer Sting, Chebb Mami and *rai* music have achieved global success with mainstream consumers.¹⁹ The Senegalese singer Youssou N'Dour had a similar boost into the global market place through collaboration with the well-known British artist Peter Gabriel. N'Dour was asked to write the anthem for the 1998 World Football Championship hosted by France.²⁰

The new economy, the new technologies, and the new opportunities augur well for the music business. Perhaps the next trends could come from Nigeria, such as the *juju* music of King Sunny Ade (who has made over 110 recordings²²); or the *gamelan* music of Indonesia²³; or the tango, bossa nova, or samba of Latin America; or literally from any other place. The space for creativity, the rapid emergence of new artists and groups, and fast-changing tastes, are all reasons why the music business is exciting, profitable, and global as well as local in nature.

As Chapter 9 will examine in more detail, the presence of strong copyright and related rights laws, and their active enforcement, are the foundation for a vibrant local and national music industry. Music piracy robs the local community of spirit, opportunity, and funds which would otherwise

flow into local products, developing local artists and musicians, songwriters and composers, and production companies and recording companies. When people are faced with a choice between a cut-rate pirate copy of, for example, the new Ricky Martin CD, as opposed to the legitimate local recordings of community artists and musicians (which must necessarily reflect the cost of developing talent) who are perhaps known but not yet popular, the dramatic cost differential most often points in favor of the pirated music. This process, caused primarily by the absence of effective copyright and related rights, kills the local market, strangles local talent and businesses, and precludes any advancement of the local music industry.

COLLECTIVE MANAGEMENT OF COPYRIGHT AND RELATED RIGHTS

What infrastructure and systems could help promote the incubation and development of local music culture? A system called collective management of copyright and related rights is one of the most effective and has been established in a number of countries on the initiative of government or through the relevant private sector. Collective management is the exercise of copyright and related rights by organizations acting in the interest and on behalf of the owners of rights. The collective management organization negotiates with users (such as radio stations, broadcasters, discotheques, cinemas, restaurants and the like), or groups of users and authorizes them to use copyrighted works from its repertoire against payment and on certain conditions. On the basis of its documentation (information on members and their works) and the programs submitted by users (for instance, logs of music played on the radio), the collective management organization distributes copyright royalties to its members according to established distribution rules. A fee to cover administrative costs, and in certain countries also socio-cultural promotion activities, is generally deducted from the copyright royalties. The fees actually paid to the copyright owners correspond to the use of the works and are accompanied by a breakdown of that use. These activities and operations are generally performed with the aid of computerized systems especially designed for the purpose.²⁴

Collective management is helpful because it is currently not possible for any one person or company to monitor all uses of its musical compositions or recordings on a global basis, or even on a national basis – although this could change with advancements in relevant technology. Dealing mainly with public performances, such as television, radio, discos, and live concerts, collective management societies play a vital role in keeping track of how and where musical works are being used, in securing compensation for such usages, in computing who is entitled to what percentage of compensation collected, and in timely distribution of compensation to its rightful recipients. It is an enormous task and is under-taken by organizations of all sizes. The following are examples of prominent collective management societies:²⁵

TABLE-6.5 SELECTED COPYRIGHT COLLECTIVE MANAGEMENT SOCIETIES IN THE WORLD*

Country	Society	Note
Australia	APRA	Founded in 1926
Cuba	ACDAM	
Estonia	EAU	1,000 members
France	SACEM	The world's oldest (1851) with 87,000 members
Germany	GEMA	Founded by the composer Richard Strauss
India	IPRS	
Indonesia	KCI	
Israel	ACUM	3,000 members
Japan	JASRAC	Its total revenues for fiscal 1998 were over ¥ 94 billion (about US\$850 million dollars). ²⁶
Singapore	COMPASS	
South Africa	SAMRO	The largest collecting society in Africa
Trinidad & Tobago	COTT	Founded in 1986
United States of America	BMI and ASCAP	BMI has 250,000 members (the world's largest) maintaining a repertoire of more than 4,500,000 compositions for purposes of licensing. ²⁷ ASCAP has 100,000 members with total revenues of US\$560 million in 1999. ²⁸
	SESAC	SESAC was founded in 1930, the second oldest in the United States (headquarters in Nashville). ²⁹

Country	Society	Note
United States of America	Harry Fox Agency	'National Music Publishers' Association (NMPA) is a service for licensing musical copyrights, established in 1927 and currently representing over 800 American music publishers. ³⁰
Zimbabwe	ZIMRA	The first independent society in Africa – established by PRS (the society of the United Kingdom).

* The full names of these societies can be found in the list of abbreviations at the end of the book.

To create and promote cultural industries in the world, and particularly in developing and least-developed countries, thoughtful consideration should be given to establishing collective management societies and to enhancing their operation. It is one effective way to ensure respect for copyright, while at the same time helping artists, musicians, songwriters, and others involved in the creative and business processes of the music business to realize income from their efforts. This is also one important dimension as to how local industries can grow and how they are helped to contribute to the national economy and as well to the national culture.

AUDIOVISUAL: MIXING SOUND AND IMAGE

The audiovisual industry is perhaps the most difficult to both define and review. It is at different times referred to as the film industry, the movie industry, or the motion picture industry. These terms are not fully inclusive, and it is referred to herein as the audiovisual industry. The highest-quality medium on which to capture images is film. Less expensive, and producing a lower-quality image, but also much used, is video, or video tape. The newly evolving medium for this process is now digital technology. Another component of the industry produces hand-drawn images, or computer-generated images, and this is generally referred to as animation (a movie or pictures consisting of a series of drawn, painted, modeled, or computer-generated images or scenes³¹). Thus, the term audiovisual is applied, and it is used herein to refer to all of the foregoing methods of capturing both images and audio elements to produce an audiovisual production.

FILM MAKING

Full-length motion pictures are marketed, according to a specific schedule, allowing for maximization of profit potential at each level. The first phase is theatrical exhibition, where the experience involves a large screen, amplified sound, and sharing with others. Separate income figures are maintained for this. The next phase is the home video market, where videograms, or, lately, digital versatile disc (DVD) devices are purchased or rented for viewing in the privacy of the home. The next phase is the release in the cable and satellite television markets, a private circuit for which consumers generally pay a subscription fee. This can be initiated by pay-per-view and is followed by general dissemination as part of regular cable or satellite programming. Around this time a niche-marketing effort to specific audiences, such as passengers on planes and boats, occurs. The final phase of the life of an audiovisual production is usually free television. However, the introduction of new technology, such as DVD, can often revive an otherwise dormant asset and produce considerable income revenue by virtue of creating a new market and new consumers for pre-existing products.³²

Copyright laws apply expressly to audiovisual or cinematographic works.³³ However, because the costs and number of parties associated with creating audiovisual works are much greater than those for writing a song or a book, special rules have developed as to who is the rightful owner of an audiovisual production. In some countries, it is the producer, that is, the one who produces the financing. In other countries, it is the persons who make contributions to the work, such as the writer of the underlying literary material, the director, producer, actors, or photographer. This is why ownership of audiovisual works is a matter of national legislation.³⁴

One large segment of the various and disparate elements which combine to create audiovisual works is the set of actors and other performers whose performances are embodied in the work. This group is badly in need of updated international and national protection. The Rome Convention (1961) was the first international instrument to focus upon and grant protection to performers. However, viewed from today's

perspective, the instrument contains provisions that do not adequately protect audiovisual performers, as technology and the economy have changed radically since its adoption. In an effort to find consensus as to protection for performers in audiovisual productions, WIPO hosted the Diplomatic Conference on the Protection of Audiovisual Performances from December 7 to 20, 2000. The conference came very close to adopting a new instrument, which could have been viewed as a follow-up to the WIPO Performances and Phonograms Treaty (WPPT), which deals only with performers of audio phonograms. However, consensus was lacking, although 19 out of 20 articles of the draft treaty were approved.

Additional income, often quite substantial, is generated indirectly by audiovisual productions, from the merchandising of items which are seen in or associated with these productions. Merchandising of items such as toys, cars, interactive games bearing the same title or including the characters of the production, books, and clothing are now much more than mere ancillary aspects of major audiovisual productions – they are often highly valuable profit centers for these expensive productions.³⁵ Large sums have been paid by global product manufacturers to have their products seen on-screen in major movies.³⁶ These merchandising items are always protected by inherent IPR, mainly copyright and marks.

As in the music industry, the audiovisual industry is dominated by global entertainment companies in which audiovisual production is just one of several endeavors (see Table - 6.6). However, audiovisual production, especially at the level of full-length feature motion pictures, does not take place exclusively in Europe, Japan or the United States of America. The audiovisual industry in India produces some 800 feature movies per year and sells billions of tickets worldwide.³⁷ Hong Kong SAR is also the home of vibrant feature film production activities, and produces products with a unique style and energy.

TABLE-6.6 RANKING BY AUDIOVISUAL TURNOVER OF LEADING COMPANIES*

1.	Walt Disney	United States of America
2.	Viacom	United States of America
3.	Sony	Japan
4.	Time-Warner Ent.	United States of America
5.	ARD	Germany
6.	News Corp.	Australia
7.	Polygram	Netherlands
8.	NHK	Japan
9.	General Electric	United States of America

*Source: Statistical Yearbook: Cinema, Television, Video and New Media in Europe (Strasbourg: European Audiovisual Observatory, 1998).

BOOKS

Copyright law in general owes much to the literary publishing industry, and to books in particular. Book production in the first millennium was a tedious, slow affair. Scribes wrote books by hand, some much more artistically than others. Organized religion was a prime moving force in the preservation of knowledge through books, as well as the proliferation of multiple copies of books.

The effect of copyright protection of books virtually all over the world is evident. Mass production of books (when compared to prior production methods) was made possible with the assurance of income from their sales. Because of books, the state of the world's knowledge expanded exponentially, and such expansion continues to this day with increasing velocity with each new technological development, such as telegraph, radio, television, computers, telecommunications, and the Internet. Books, in general, have been one of the most important and durable inventions ever. The proliferation and wide dissemination of knowledge through books has had and still has an immense impact on civilization.³⁸ Books, as well as newspapers and magazines, are easily shared because of their compact size and portability.

THE MASS MARKET

The literary publishing industry covers more than books, although one could easily focus on just that element, since over 50,000 new book titles are published every year, more than 500 million copies of books were released in print format in 1999, and the industry generated more than US\$80 billion in revenues.³⁹

However, it would not present the full story of the literary publishing industry to focus only on books, since newspaper publishing and periodicals are also an integral part of that industry (see Table - 6.7). In 1996, there were an estimated 8,391 daily newspapers in the world, with an estimated readership of 548 million.⁴⁰

TABLE-6.7 A LIST OF SELECTED NEWSPAPERS WITH CIRCULATION (1999)

1.	<i>Yomiuri Shimbun</i>	Japan	10,233,923
2.	<i>Asahi Shimbun</i>	Japan	8,321,138
3.	<i>Sichuan Ribao</i>	China	8,000,000
4.	<i>Bild</i>	Germany	5,674,400
5.	<i>Mainichi Shimkibun</i>	Japan	3,978,617
6.	<i>Sun</i>	United Kingdom	3,687,370
18.	<i>Eleftherotypia</i>	Greece	1,858,316
20.	<i>Wall Street Journal</i>	United States of America	1,752,693
21.	<i>Kerala Kaumudi</i>	India	1,720,000
40.	<i>New York Times</i>	United States of America	1,086,293

Source: <http://www.mediainfo.com>.

Because of the convenience with which newspapers and periodicals deliver their content, whether news, current events, easily digestible stories and features, or dazzling photographs, they have successfully relied upon copyright laws to safeguard their products and services from what otherwise could be rampant piracy and illegal use. As literary works, newspapers and periodicals are protected in the same way as books. However, because of the nature of their products and services, and because of the new methods of distribution, there are two areas in which

copyright laws are being both challenged and reclarified as they apply to newspapers and periodicals. One is the area of publication of excerpts and quotations of copyrighted material in the interest of free speech, public dialogue and criticism, and publication of current news. In some countries, notably the United States of America, such publication may be justified as an exception to copyright laws under the doctrine of "fair use." The copyright system in this case serves to achieve a fair balance between right holders, on the one hand, and the interests of the public, on the other hand.

Another interesting copyright issue which has arisen recently is the ability of newspapers and magazines to take literary works primarily intended for publication in paper editions, and to republish them in electronic format. Does the underlying license or assignment cover publication in both media? That is the issue which copyright law is now dealing with; cases centering on this issue are making their way through various court systems at the moment. While there are arguments on both sides, one thing is crystal clear: books, newspapers, and magazines, as an industry, have been able to protect their products and services, expand their businesses, and reach out to millions of people, because copyright laws have given them the required assurances, consistency of results, and reliability.

COMPUTER SOFTWARE

The heart and soul of the digital revolution is computer software. The computer software industry is huge.⁴¹ It touches literally everything which is digital. It is the only industry which has never had to cope with the impact of the digital revolution, since it is the only industry which commenced its business in digital format; and it has served as the basis for the creation of more new wealth than at any other time in history.

Software and computers are inextricably tied together. Computers were created during the 1940s, and at first went through a slow evolution. Things took a quantum leap forward in 1976, when Apple Computer developed a powerful personal computer which allowed ordinary people

to bring unprecedented computing power into the private home. From the point of the introduction of the PC in 1981, not a day has gone by without some new development, advance, or breakthrough in this industry: computing power and capabilities, data storage and management, and telecommunications – but it is computer software which is fundamental in most of these advances (see Box - 6.8).⁴²

BOX-6.8 COMPUTER SOFTWARE INDUSTRY IN ISRAEL

In 1984, software exports from Israel amounted to US\$5 million; in 1997, this figure had soared to US\$540 million, with an annual average growth rate of 25 percent. Domestic software sales have grown by 10 percent per annum, and in 1998 were then expected to top US\$1.5 billion. Israel's software industry has more than doubled in size in recent years, and the country provides leading-edge software in fields as diverse as defense, commerce, education, and entertainment. The government has made a conscious decision to emphasize computers in daily life. Every kindergarten in the country has a computer, and over 35 percent of Israeli homes have computers. The list of major software companies with operations in Israel is extensive, and even more impressive is the work of venture capitalists there, who have helped create over 500 new and promising start-up businesses in the software field in just the past few years. Underpinning all of this economic growth and development, is the fact that the Israeli government is a strong supporter of IP laws.

Source: <http://www.iash.org>.

How big is the computer software industry? The following figures are revenues for licensing computer software for four large US companies in 1999: Microsoft, US\$21.6 billion; IBM Corporation, US\$12.7 billion; Computer Associates, US\$4.9 billion; and Oracle Corporation, US\$3.8 billion.⁴³

Computer software is considered a “literary work” meriting protection under copyright law. Software is written and created by using instructions in words, or a source code, which contain instructions for the computer hardware. Computer software protected under copyright as a literary work was debated during the 1970s and 1980s, and some consideration was given to the creation of a *sui generis* or special form of intellectual property protection unique to computer software. This idea of a new breed of IP was ultimately rejected as it became clear that the rules of copyright as applied to other art forms were flexible enough to apply to the expression contained in computer source code.⁴⁴ As the law of copyright relating to computer programs evolved, especially in the United States of America, it was extended to protect the “structure, sequence and organization” of computer programs and the text and visual appearance of the programs on the screen. But copyright extends to the expression of ideas, and not to the ideas or process(es) embodied in any literary work or software program. That paradox, often referred to as the “idea versus expression dichotomy,” led some to seek patent protection for inventions contained in their computer software programs, in addition to copyright protection.⁴⁵

COPYRIGHT VERSUS PATENT PROTECTION

Many computer software programs satisfy the basic elements for the issuance of a patent: industrially applicable (useful), new, and not obvious. Thus, patents have been issued on many software-related inventions.

Notwithstanding the issuance of software patents, many more right holders rely on copyright protection for computer software. The dynamics of protection under copyright and patent are quite different. Copyright protection is automatic and vests upon the creation of the work at the time the program is written. Depending on the provisions of the relevant national law, such protection may last for the life of the author plus 50 years (now 70 years under many national laws, such as the European Community member States and the United States of America). Patent protection is subject to strict procedures for the perfection of rights, such as examination, public disclosure, and maintenance fees. The term of

protection for patents is more limited: 20 years from the date of filing. Patent enforcement, however, is more extensive than that provided under copyright law. Finally, because a patented invention is generally broader in scope and applies to an idea, not an expression, it may be easier to avoid copyright infringement by expressing the same idea using different source codes.

Another supplement to copyright protection for computer software is trade secret law, which can protect a computer software source code as long as it has been maintained as a secret. One way in which computer software has affected intellectual property profoundly is that the same software product or technology may be protected by copyright, patent and trade secret law. Whereas, before the advent of the technological age, it was common to think of patent law as applying to technology and copyright law as applying to culture and art, these distinctions have become more blurred. A recent example of this has been the plethora of patents issued on business methods,⁴⁶ a subject matter that recent case law in some countries recognizes as legitimate for patents, but which might have been thought of years ago as a non-technical subject more correctly protected by copyright, trade secret or unfair competition law. The good intellectual property strategist will think in terms of various forms of legal protection for the same product or technology.

OPEN SOURCE SOFTWARE AND COPYRIGHT

If business-method software is a reflection of seeking stronger exclusive rights for intellectual property through use of the patent system, a new movement in the area of computer software, most particularly with respect to the operating system,⁴⁷ is open source software,⁴⁸ which seeks to freely share the intellectual work of other like-minded programmers. The open source software movement contrasts with the business decisions taken initially by the management of Apple Computer, with respect to its operating system. Until the mid-1990s, they refused to license it to any other manufacturer, a business practice that caused Apple's operating system to lose support from application developers.⁴⁹ Open source software also takes a completely different approach than Microsoft, which licenses its Windows operating system to manufactures and vendors

who agree to its licensing terms, thereby guarding the particulars of the operating system as proprietary assets. Whereas one is not legally able to modify, adapt, or change the Windows operating system, the source code of open source software is guaranteed to stay "open".

The central idea behind open source software is that any programmer who has received a copy of the software and has agreed in a licensing contract to its conditions, can adapt, change, modify, reproduce, and disseminate the operating system. This does not mean that the software is necessarily free, publicly owned, or without significant limitations on use. The mindset behind this is a sort of collective development: more programmers focusing on the program will bring swifter upgrading, a quicker fix for problems and bugs, and make a better program; and nobody will own the addition, upgrade, or modification.⁵⁰ Approximately 90 percent of the world's personal computers employ the Microsoft Windows operating system.⁵¹ Open source operating systems are, currently, installed in relatively few computers. It also has difficulties to overcome, for example, there is no central authority to confirm or reject modifications made by a number of programmers and there is a limitation to technical support and warranties for modified versions.⁵²

Computer software owes much to copyright laws. There is no faster moving industry, in terms of developments and advances. Automatic protection for programs, applications, and upgrades has been an immense advantage, since it seems that there are advances literally everyday. Copyright protection for software was updated and clarified by the WIPO Copyright Treaty (WCT), to keep pace with technological and telecommunications developments, particularly the Internet. The WCT, and its sister treaty, the WIPO Performances and Phonograms Treaty (WPPT), were referred to in the media as the "Internet Treaties." They entered into force, respectively, in March and May 2002. Even open source software, which at first glance might appear to run against copyright and its underlying rationale, is actually made possible and sustained specifically because of copyright. The exclusive rights which the open source software movement shares among the world programming community (reproduction, adaptation, and communication to the public) are defined by copyright. These rights are inherent in the products, services, and processes which make the open source movement viable, and, while

implemented through contractual licensing (mostly in the form of click wrap and shrink wrap licenses), rights attributable to open source software are enforced as industry-inspired exceptions and limitations through copyright law.

WORKERS OF THE WORLD

The computer software industry has grown exponentially during the past decade to the point where software companies are not able to adequately fill their employment needs from existing pools of workers. Hiring and signing bonuses are becoming more prevalent in this industry, and stock options, in both start-up companies and long-standing, major corporations, are also becoming more common. Some countries have emphasized the future employment potential in this industry and produced a surplus of skilled workers. The best example of this is India, which has a rich pool of computer programmers (see Box - 6.9).

The immigration aspects of importing skilled workers have come to the public's attention lately.⁵³ Skilled workers imported for specific projects and jobs, with special immigration status or visas, are one answer. The existence of the problem of the availability of skilled workers is good evidence that this particular industry is growing by leaps and bounds. In dealing with the shortage of skilled workers, mainly computer software programmers, one must not forget that there is little incentive to educate and develop skilled software programmers if a country's copyright system is too weak to respect and protect their work from piracy and theft.

BOX-6.9 SOFTWARE INDUSTRY IN INDIA

In the 1970s, the Indian Government made a crucial decision to focus more of its resources on higher education for its citizens. In 1980, the government looked at computers and computer software as a focal point for economic growth and development. Along with revisions to its IP laws, the government changed its standard computer operating system to what was then the emerging international standard, CP/M. It also established software technology parks, the largest being in Bangalore. The results have been measurable and positive. IT software

and services industries in India grossed US\$5.7 billion in 1999/2000, and reflected an overall growth rate of 53 percent. More than 40 percent of the "Fortune 500" companies outsourced their software requirements to India during this period. The market capitalization of Indian software companies listed on the Indian Stock Exchange, during the period January 1999 to February 2000, grew from US\$4 billion to US\$95 billion. During the same period, software exports earned foreign exchange worth US\$4 billion, and accounted for 10.5 percent of India's total exports. Surveys predict that the software sector in India during the next one-year period will grow at the extraordinary rate of 50 percent. Of the 134,000 H-1B work visas granted in the United States of America in 1999 – visas permitting foreign workers to enter the country for employment needs that cannot be filled domestically – fully 48 percent came from India, a sure acknowledgement of the quality of the Indian computer software work force.

Source: <http://www.nasscom.org/>; <http://www.heinz.cmu.edu>

APPLICATION SERVICE PROVIDERS

One of the more interesting developments concerning the availability and use of proprietary software programs is the sudden rise of application service providers (ASPs). These companies allow users to make use of their software programs for a limited time, mainly through the Internet. Why buy a program when you can rent someone else's, especially for short or periodic usages? These ASPs change the business model for proprietary software companies. Rental rights in such programs exist to prevent abuse and to protect the underlying program creator. Many ASPs, which must make available to their users varied and multiple products, feel that an open source software architecture is the best way to tie together disparate components and to distinguish themselves from their competitors.⁵⁴

COMPUTER SOFTWARE PIRACY

Piracy of computer software programs can undermine the exciting growth and development of this industry. As in other cultural industries affected by this problem, piracy of computer software is a serious challenge to the economic vitality of the industry, and countering it requires constant and determined efforts. With respect to computer software, one form of misuse is sometimes unintentional, that which occurs within SMEs. A software program is purchased legitimately then copied and used by multiple users in the company. This widespread practice is contrary to both copyright law and the contractual terms of most software packages. A site license permitting use by multiple users at one site may be required. This is a situation which can be fixed relatively easily by raising awareness and providing accurate information to the users involved.⁵⁵

Piracy of computer software programs on the Internet is a far more serious problem. Microsoft is approaching this problem using a natural weapon: applied computer software programs which search the Internet nonstop for certain words and phrases which indicate illegal activity. These programs, commonly known as "web crawler software," have resulted in the removal of over 7,500 illegal products in 33 countries, 64 criminal raids, and 17 civil lawsuits in 15 countries. It is reported that this software is being developed by Microsoft to search out not just their own software programs but also piracy involving music and motion pictures.⁵⁶ This is one way in which technological measures of protection, as supported by applicable provisions in the WCT and WPPT, are helping to enforce copyright protection and protect all of us from illegal and often dangerous products.

The computer software industry is one in which creativity; entrepreneurship; multinational enterprises; innovation; increasingly short-lived product cycles; the interests of the public at large and governments; and the well-being of many other industries and businesses, all intersect. Developments in technology, marketing, and products are accelerating, perhaps faster than in any other industry. Wealth is being created within this industry and, as a result, in other industries, at a rate and of such enormous proportions as has never been witnessed before. This industry, like all of the others discussed in this chapter, deals with serious piracy

challenges; this industry, like the others, also looks to copyright law for the protection and well-being of its products and services. For all of these reasons, therefore, piracy in this industry is a problem which we can not afford to ignore, even for a moment.

INTERACTIVE SOFTWARE ENTERTAINMENT AND EDUCATION PRODUCTS

In the mid-1980s, there was a movement to create a new category of copyright work called multimedia. It was an attempt to deal with the opportunities created by computer software and related devices storing software content, such as CD-Read Only Memory (ROM). This industry in reality comprises two vital, exponentially expanding elements: interactive gaming products, and interactive education and entertainment products. They are grouped together because they use the same technologies and the same principles of copyright protection, the products appear similar in terms of their mechanics and technologies, and the net result is the same, whether it be education or entertainment (so-called "edutainment").

GAMES

Three multinational enterprises (Sony, Nintendo, and Sega) have the major share of the interactive games industry, at least in respect of its current hardware manufacturers. Microsoft, subsequently joined this sector in which the stakes and profits are enormous.⁵⁷ The devices manufactured for these interactive games reflect much of the technological mind behind the ever-increasing push for market advantage. For example, Nintendo's Game Boy™, a 100-million-plus selling product manufactured in 52 different colors, is a market leader. It is a handheld device, as contrasted with Nintendo's 64™ device, which is used in conjunction with a personal computer (PC). The Game Boy™ plays games especially made for that device, or platform, including the very popular Pokemon™ series of games; the device is also compatible with the Game Boy Camera™ and Game Boy Printer™ as add-ons.⁵⁸

Nintendo's competitors have their own ideas about how to service this vast market. Sony is currently the leading company in this field. Its Playstation™ platform was a very popular device and has been updated by the much-improved Playstation 2™ model. The Playstation 2™ device is a console with enormous power; it also plays DVDs and allows its users to connect to the Internet, attach a hard drive and keyboard, as well as play games. In its first week of release in Japan, more than one million units were sold. It was released in the United States of America on October 26, 2000, together with 26 new game titles created especially for it.

Sega has long been working on plans to challenge Sony in the console market with its own version, the Dreamcast™. However, on January 31, 2001, Sega announced that it was abandoning all work on the Dreamcast™ model, at a considerable loss. Seeing how large and lucrative this market segment is, Microsoft has entered the competition with its own platform, which it has labeled the XBox™. The XBox™ stats of 600 MHz Intel Pentium processor, graphics chip, 3-D audio sound, 8 gigabyte hard disk drive, and Windows 2000™-based operating system, are considerably more powerful than many PCs.⁵⁹

The foregoing is a very brief overview of the specially designed and manufactured hardware and software components of this rapidly growing industry. It does not include the market for the vast array of home PCs for which these types of games and programs can be purchased.

One dimension in this area which copyright law is able to deal with is that of the characters appearing in these various productions. When a character is artistically and graphically rendered, or adequately described in a literary work (which is how most of these productions are initially created) as the basis for a video game, edutainment, or film production, copyright law generally protects that character in the same way that the entire work is protected, from the point when it is created or fixed, without regard to further formalities. James Bond™, the Pink Panther™, Lara Croft™, the Pokemon™ characters, the multitude of characters from the Star Wars™ series, are merely a few of the many examples which have received life after their initial debuts and which, like many of the others, have demonstrated that intellectual property (here, copyright) is a limitless

resource which is renewable; which creates jobs, businesses, and even industries; and which can expedite economic development when the IP regime is nurtured and vigorously enforced. Without viable copyright protection, these characters would probably not have been created, and they would surely have experienced abbreviated lives. It is important to note that copyright protection for characters is not evenly recognized or enforced in the international context. Moreover, other areas of law and remedies are often employed in the protection of characters, most notably contracts, and the law of unfair competition, misappropriation, and marks.

“EDUTAINMENT”

The digital revolution has had a profound impact on education and leisure time entertainment. The widespread availability of a CD-ROM containing educational materials, such as the *Microsoft Encarta Encyclopedia*TM, is a good example of the high value which such a product might offer for those who do not have Internet connectivity. In this example, however, interactive CD-ROMs have almost killed the market for encyclopedias in book form; in that regard, note the shift of the *Encyclopaedia Britannica*TM from a paper-based product, to an interactive product offered at one of the most heavily used websites. The addition of audio and video dimensions (as offered within the CD-ROM platform, as well as through Internet-delivered programs) is a good example of the essence of what the digital revolution can bring to almost any given situation, such as making educational products which talk, incorporate music and other sounds; link to other related subjects; and respond to questions or directions from the viewer.

Interactive games and leisure programs constitute a vast and growing industry as competitive as any other. The interactive games industry has been growing faster than any other part of the entertainment business; estimates of annual gross revenues are in excess of US\$20 billion.⁶⁰ A popular interactive game or program can generate hundreds of millions of dollars in sales revenues, easily topping best-selling books and all but the very highest-grossing films. Multi-platform titles such as *Myst*TM, *SimCity*TM, *Command and Conquer*TM, and *Wing Commander*TM, have

each generated over US\$100 million dollars for their publishers.⁶¹ Other titles on subjects as diverse as golf, basketball, Formula 1 auto-racing, football, soccer, and flight simulation, are extremely popular and also generate large revenues for their publishers.

It is interesting to note that almost anything which achieves popularity in its own right can be the subject of an interactive game or software program. James Bond™ is the subject of an award winning game, *Tomorrow Never Dies™*; and David Bowie has created his own interactive video game, *Omikron: The Nomad Soul™*.⁶² Literally anything or anybody can be used as the subject of such games and programs, which reflects one of the important tenets of intellectual property in respect of economic growth and development: it is literally unlimited in terms of what is possible.

As with all forms of copyrighted works, piracy and counterfeiting are major problems with which this industry is coping. It is claimed that piracy cost the US producers of interactive video games more than US\$3 billion in 1998⁶³ (for further discussion on enforcement of IPRs, see Chapter 9).

The interactive entertainment and education industry uses the latest technological developments and, with the vital assistance of copyright law, brings information, entertainment, leisure time activities, and educational opportunities. There is no more competitive industry, both in terms of technology or product development, consumer promotion, and outreach. Its products often reflect current events, current themes of entertainment, or cutting edge issues, and they allow the consumer to experience things he or she might not otherwise ever be able to experience, such as flying an aircraft, playing on the world's greatest golf courses, or being in the middle of the world football championship. The educational products can bring awareness and enlightenment to people who might live in places and under circumstances where such things are not normally available. This is invaluable as they are tools for giving opportunity, inspiration, and hope where there might not have been any. They can also be great entertainment.

COPYRIGHT AND TECHNOLOGICAL CHANGE

The introduction and enhancement of new media, information, and telecommunications technologies – such as the videocassette recorder (VCR) in the late 1970s, the digital revolution in the 1980s, and the Internet in the 1990s – have consistently challenged both copyright laws and the cultural industries and communities which live and prosper under them. The next section will discuss what impact the changes brought by technological advances have had on the copyright system and how copyright laws have been interpreted, adapted, and clarified as a response to those changes.

VIDEOCASSETTE RECORDERS

The VCR was developed and introduced with the technical capability to record from the television, and some models provided for two-cassette devices, which allowed for home recording from other cassettes. A major court case in the United States of America (*Sony Corp. vs. Universal City Studios, Inc.*, 464 U.S. 417 (1984)) was fought over this new technology. The case, ultimately decided by the US Supreme Court, held that it was “fair use” for consumers to tape free over-the-air broadcasts at home for the purpose of watching them at a later time, and introduced the term “time shifting” with respect to recording television programs and productions for later viewing. Private copying is seen as an exemption from copyright infringement in many countries. It often co-exists with a parallel system of levies on blank recording materials (blank tapes and hardware) to offset the losses associated with private copying, a system which appears to have established a fair balance among the various interested parties involved in the issue.⁶⁴

THE DIGITAL REVOLUTION

In 1995, a media guru predicted that a change from atoms to bits was irrevocable and unstoppable. The methodical movement of recording music as analog signals or waves on pieces of plastic, like the slow

human handling of most information in the form of books, magazines, newspapers, and VCRs, was abandoned in favor of the instantaneous and inexpensive transfer of electronic data that moved at the speed of light.⁶⁵ In fact, the digital revolution had really started in 1981, when Philips and Sony jointly developed the CD, and adroitly offered to license this technology to any manufacturer or company that agreed to a simple license and royalty arrangement. This was the first time that massive amounts of data were capable of being brought to the attention and use of ordinary people at a reasonable cost.

DIGITAL MEDIA AND COPYRIGHT

The CD swiftly replaced vinyl records and music cassettes, as its new format embodying digital technology in a mobile and longer-lasting form was quickly accepted by the public and the major recording companies. The result was that the music industry was given an opportunity to resell their existing catalogues anew in CD format.⁶⁶ This surge of new and unanticipated revenue financed unforeseen company expansion, the signing and development of many more new artists, and perhaps funded more than a few M&As.

Audiovisual productions in digital format are also gaining much success because of their high quality resolution, and relatively inexpensive price. A whole new generation of consumers is now repurchasing audiovisual productions which were thought to be inactive, or at least not commercially viable. However, audiovisual subject matter, when it is digitized and reproduced in DVD format, is much easier to copy and is susceptible to unauthorized posting on the Internet. Millions of copies potentially could be pirated in this scenario. Strong efforts are underway by the industry to prevent this form of piracy and, where it occurs, to stop it in its tracks and seek civil or criminal remedies against those responsible. Technological measures, such as encryption, to stop digital piracy are essential. The audiovisual industry agreed on an encryption technology to protect audiovisual content when manufactured and disseminated in DVD format. The WCT and WPPT contain special provisions which prohibit any circumvention of such measures of technological protection for copyright works.⁶⁷

Literary works are also available in digital form. An e-book is an electronic device, generally small and portable, which contains a digital version of one or more books, made readable by a screen and an addressable operating system. Though several technical problems remain unresolved, the opportunities presented by e-books are impressive in terms of portability, searchability and, not unimportantly, the preservation of trees. E-books offer undreamed of opportunities for new and unknown writers, opening up channels for self-publishing, as well as low-cost publishing by non-publishers, or by publishers specializing in vanity publishing, subscription publishing, and do-it-yourself publishing.⁶⁸

Electronic publishing in digital form, on-line or off-line, also heralds the possibility of custom-made, state-of-the-art books and materials. Completely new, "composite" publications can be created on demand, where a reader or user might have very specific interests. The searchability of electronic databases, the accountability of electronically licensing the subject materials with proper credits, and the cost-effectiveness of automated printing, make these potentially valuable publications a reality.⁶⁹ Newly developed automated printing systems also offer new hope and new opportunities, not just to new or unknown authors, but to the developing and least developed countries and the supply of books and printed materials in their educational systems. With these new systems, producing 10 copies of 100,000 titles can be almost as profitable or cost-effective as producing 100,000 copies of 10 titles. Books can, therefore, be custom-made for specific situations, classes, or schools and, perhaps most importantly, in different languages. The possibilities and opportunities are both clear and exciting.⁷⁰

Because of these technological advancements and developments, there are also important challenges to basic copyright law. Copying and transmission are rendered easy; the applicable laws of copyright therefore become more easily violable. Technological methods of protection, such as encryption with subscriber or fee-based keys are logical methods of protecting works in digital form, but are also not without problems. The more layers of protection one places on a work, the more difficult it is to get it to the consumer, thereby defeating the optimum commercialization objectives of selling to the public in the first place. Technical

solutions are expected to be found which resolve the myriad problems, and which take into consideration the interests of all those involved, including the author's and publisher's need for widespread commercial dissemination of their works under protected circumstances, as well as the public's need for works in a cheap and easily obtainable format.

With the digital revolution, and all the technological and other developments it has brought, some question the continuing viability of copyright in the face of such dramatic change. Those who ask such questions, however, are a minority, because copyright has withstood every technological change which has taken place; and for good reason: copyright laws support technological innovation and creativity.

Digital technology and the Internet have changed the way in which we receive information, including copyrighted works. Does that mean that we must completely rewrite copyright laws? Of course not. Copyright laws have been created, written, and refined to provide for such challenges. The language in the Berne Convention on the most basic of all copyright rights, that of reproduction, was written in a way that can encompass any of these types of technological and other challenges. Berne Convention Article 9(1) states 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." This provision has withstood the test of time, the test of change, and even the test of digital technology. The concept and the language were carried forward in both the WCT and the WPPT, where Agreed Statements state that: "The reproduction right... fully applies in the digital environment, in particular to the use of works in digital form."⁷¹

The legal cases which we are seeing now, in which the underlying facts are pushing the interpretation of existing copyright laws (for example, Napster in music; DVD audiovisual works; video games; and television shows), are uniformly being decided on sound copyright principles. As will be discussed later with respect to the Napster case, judges are interpreting copyright laws in respect of specific situations in ways that support and affirm the rights of authors, artists, creators, and inventors, and those who finance, manufacture, and distribute their creations.

COPYRIGHT AND THE INTERNET

As mentioned above, certain technological developments have pushed the evolution of copyright laws, as can be seen regarding the revisions to the Berne Convention, which occurred in Diplomatic Conferences held in 1908, 1928, 1948, 1967, and 1971. The Diplomatic Conference on Certain Copyright and Neighboring Rights Questions, held from December 2 to 20, 1996, which adopted the WCT and the WPPT, can be viewed as an extension of these efforts to update and clarify copyright laws. For specific reasons, in this instance, it was felt that it would be better to adopt new treaties than to amend the existing Berne and Rome Conventions.

These Diplomatic Conferences took place approximately every 20 years, and reflect the technological challenges of that time. Copyright laws, and the purposes and objectives which underlie them, have withstood all of the challenges that technology has posed, including the phonograph player, radio, television, photocopier machine, VCR, CD, and DVD. However, another major challenge to copyright is now upon us: the Internet.

While the Internet has not penetrated every home (the current estimate of Internet penetration is 560 million users, or 9 percent of world population), use is sufficiently widespread and increasing at such a rate as to make it impossible to ignore.⁷² Its effects on bottom-line business operations also cannot be ignored. It potentially allows every person to have access to virtually unlimited products, services, and information, and at almost the same time. Because of the tremendous good which can come of this particular advance, we must guard against its being used for illegal or improper purposes, or for negative reasons. The Internet cannot become a lawless zone of illegal activity, characterized by theft, piracy, fraud, or other criminal activity.

Copyright laws, and the works they protect, are being challenged in the context of the Internet. During the first half of the 1990s, the copyright community had intense discussions at WIPO regarding the impact of the Internet on society and with respect to intellectual property. The WIPO Internet Treaties, the WCT and the WPPT, entered into force in March

and May 2002, respectively. The next section will describe the most recent events which are testing the viability and robustness of the Internet Treaties.

CHALLENGES FROM NAPSTER

New (MP-3) technology has made it easy to compress music files, so that they take up considerably less space, are easy to upload and download over the Internet, and can be neatly stored in mobile devices. Most of such activity occurs without the knowledge or consent of the right holder to such music and, thus, is in violation of the spirit, intent, and express provisions of copyright law. Napster facilitates the sharing of MP-3 music files (as well as files of other copyright works), both from a central server with a database of thousands of files, and from one consumer to another without the necessity of a central server, popularly known as a peer-to-peer (p2p) transactions. This activity is almost always without the knowledge or consent of the right holder.

As a result of litigation initiated by the major recording companies, the proprietors of the MP-3 technology have entered into a licensing arrangement with the rightful owners of the recorded music, thereby legitimizing their activities. A negotiated royalty or licensing fee will be paid for certain types of use of the copyrighted works. Consumers who wish to enjoy the advantages of the new technology through this business model will enter into a subscription arrangement with the provider, for example, the MP-3 enterprise. In return for a small monthly or yearly subscription fee, consumers will have quick and easy access to huge amounts of recorded music within a legal framework that supports the integrity of copyright law. This business model is feasible because a central server lies at the core of the operation.⁷³

On the other hand, for the p2p activity which the Napster program and its progeny (such as Gnutella, Freenet, OpenNap, and Aimster) have created and facilitate, there is no central server to identify illegal activity. It is suggested that the answer to this particular area of illegal activity will be found in technology such as a computer software program which identifies illegal transactions and those persons or entities involved.

Consumers have a great interest in and need for music; and more specifically, for that music to be delivered to them in the easiest possible way, and as inexpensively as possible.

On February 12, 2001, the United States Court of Appeals for the 9th Circuit rendered its landmark decision in an important legal case, *A&M Records, Inc., et al. vs. Napster, Inc.*

The court ruled that Napster's "fair use" defense, which Napster claimed occurred through sampling, space shifting, and permissive distribution, was without merit, and that as a consequence, Napster would be held liable for contributory infringement of copyright if the case was ever tried at the district court level. Napster had been given actual legal notice of the infringing nature of its activities, but it had failed to take any action to correct those infringements; it had also failed to police its system, which the court found would have been possible through its file-tracking capability. Napster would also be held vicariously liable for the infringements of its users. The court ruled that, contrary to Napster's claims, the safe harbor provisions contained in the US Digital Millennium Copyright Act applicable to legitimate ISPs did not apply to Napster.

Napster exploded in popularity in 2000, eventually gaining some 80 million users who freely exchanged copyrighted music. Napster's activities had negatively affected legitimate CD sales and had likewise presented an obstacle for the legitimate right holders (the record companies) to attempt to enter the business of distributing music on-line through the Internet with their own operations. Napster's activities were held to be for commercial gain: the more users it was able to service and demonstrate, the more investment funds it was able to receive, and the more valuable its stock would become. Finally, the court refused to establish a compulsory licensing arrangement which would have legitimized Napster's activities (in the court's own words, "would have given Napster an 'easy out' of the case").

One other important argument in this case should be mentioned here. Napster argued that its activities were nothing more than home copying and personal use, which the United States Supreme Court had specifi-

cally approved in respect to VCRs in the case of *Sony vs. Universal*. The court, in rejecting Napster's defense, distinguished the two cases. VCRs had a substantial legitimate use and involved only the potential abuse of reproduction rights. Napster, on the contrary, had a substantially illegal use (the underlying documents confirmed that Napster had built its business on this premise), and also violated the right of distribution.

Napster closed its service in July 2001. Since then, Napster and the record companies have been preparing for a trial at the US Federal District Court in Northern California in which the companies are seeking damages. In February 2002, Judge Marilyn Patel of the Federal District Court wrote that these could amount to billions of dollars.⁷⁴ The Napster case, as it has come to be known, is important for several reasons. Sharing copyrighted works over the Internet without the authorization of the applicable right holder has been found to be illegal, contrary to copyright law, and punishable by the full weight of the legal remedies available for infringement. While this case took place in the United States of America, it is a major precedent in an area of rapidly evolving law, based entirely on the provisions of the WCT and the WPPT, which can serve as good law for other countries who are in the process of implementing the provisions of these treaties. Finally, while the case was about music, its principles are equally applicable to film, video games, computer software, and literary works.

CHALLENGES TO LITERARY PUBLISHING

Literary works are also under assault, but the response by this industry has been somewhat different from that of the music industry. Books have largely been spared the widespread copying and dissemination which has occurred in music. Though few people will want to read a book on the computer screen, digital publication of works over the Internet is growing, and will continue to grow, in spite of the attendant legal, technical, and practical problems.⁷⁵ A publisher's digitization of his entire catalogue will also open increased possibilities for piracy of those works. This is a situation which should be monitored with a view to further developments.

The newspaper industry has made substantial changes in its business model to adapt to the new environment. Most major newspapers have established Internet websites, on which they post a free electronic version of their newspaper. Very few newspapers are able to charge a fee for electronic access to their products. This business model of giving its product away is not one which these businesses would have voluntarily chosen, but they are left with no viable alternative. People refuse to pay for what they can get legitimately elsewhere for free. Therefore, subscription fees for news services are difficult, but not impossible. Popular sites, such as, for example, those of the *New York Times* and CNN, derive money from advertisers who pay to have themselves displayed on these high-traffic sites. High volume Internet sites establish brand name and market share. The new business models which will tap into these new economic changes, and thereby make them profitable, are being worked on currently.⁷⁶ However, newspapers and related publications, in which one is dealing with shorter works with time-sensitive dimensions, have, in large part, adapted to the new paradigms without much litigation or destructive posturing. The consumer is constantly being given more products and services from which to choose.

CHALLENGES TO COMPUTER SOFTWARE

Computer software has also been rampantly copied and illegally offered for downloading over the Internet. The software industry has incurred huge losses from piracy over the Internet and through the illegal reproduction and sale of physical copies. Computer software programs are protected works. Relying on rights provided in the WCT and the WPPT, the computer software industry has zealously sought out those who illegally offer their products to the public. The industry has used the courts and law enforcement agencies, and has also created special programs (webcrawler software) to seek out websites which illegally offer computer software, and many have been shut down. However, because new piracy operations are born or resurface daily, this is a never-ending fight which requires huge resources and efforts.

Present and future efforts by the computer software industry to fight piracy, especially the type that uses the Internet as its means of reproduction

and distribution, will be ably assisted by the provisions applicable to this issue in the WCT and the WPPT and by the implementing national legislation which will bring those provisions to the countries which ratify or accede to these treaties. The intelligence and foresight of those delegates who negotiated and then adopted the treaties in 1996, when many of the problems involving piracy over the Internet had not yet surfaced, are all the more admirable. WIPO is proud to have provided the forum and environment in which these two far-reaching international instruments came into being.

Two of the treaties' provisions are worth mentioning here. The right of communication to the public, including making works available over the Internet, provides, for the first time, a right for the owner or right holder to consent to his or her work being posted over the Internet. This important right is applicable not just to computer software, but also to all copyrighted works, as well as the related rights which are the subject of the WPPT. The other noteworthy provision is the obligation to provide legal remedies against the circumvention of effective technological measures that are used by right holders in connection with their exercise of rights in the digital environment, again particularly regarding the Internet.

Such technological measures include a technology called steganography, also known as watermarking. Through steganography, information can be embedded in the copyrighted works, such as music, films, software, and books, in digital or analog form, allowing the copyright owners and entities concerned to determine whether the work has been illegally copied.⁷⁷ It is expected that these many forms of technological protection, including encryption, will become mature enough to be an effective control mechanism of copyrighted works in the digital and on-line environments.

Better copyright management will help to reduce all forms of piracy, and to encourage use of the new digital technologies and of the Internet. These incredibly powerful tools, taken together with the proven and potent benefits inherent in copyright and related rights laws, can serve as the basis for developing the many cultural activities associated with and protected by copyright. At the same time, it is important to recognize the criticisms that have been made of overly strong management

technologies as possibly jeopardizing other public interests, especially exceptions to copyright protection based on public debate and free expression. The balance between effective protection against copyright infringement and the public policies underlying exceptions to copyright law is currently an issue of great interest and importance.

CHALLENGES TO THE AUDIOVISUAL INDUSTRY

The motion picture and video industry was for a time spared the wholesale copying and distribution of its products via the Internet experienced by the software industry; however, with the digitization of audiovisual works, this situation is now changing. The specific reason for the previous lull on this particular front is that motion pictures are bandwidth and storage intensive; downloading a full-length motion picture can take in excess of 12 hours, a period of time most consumers are not yet willing to give for that purpose. This situation is changing, however, as the public infrastructure is greatly enhanced, and, as a consequence, more and more bandwidth comes on line.

The motion picture industry has made a concerted decision to "go digital" in the past few years. An industry-wide standard was finally agreed upon, and the DVD came into being as a common platform for the dissemination, use, and enjoyment of full-length motion pictures. This digitization also opened the door, as in music and other works, for easier copying. An encryption system for DVDs known as the Control Scramble System that was put in place was soon hacked; litigation to prevent the dissemination of the disencryption program has thus far supported the rights of copyright holders as opposed to the interests of pirates and hackers.⁷⁸

Video games and interactive entertainment and educational programs are in a situation similar to that of motion pictures. Their programs are so large and storage intensive that they have not been the subject of widespread piracy, although they have not been totally immune. Some websites offering these programs without authorization have been sued by right holders, and the rights of copyright holders have been sustained

there also. As in the motion picture industry, this industry is vigilant and aggressive about protecting its property and its rights, and with the support of the WCT and the WPPT, copyright will prevail in the face of these ongoing challenges.

Copyright laws provide the framework by which businesses and persons involved in the cultural industries can make important business decisions, can rely upon and expect consistency and reliability for their operations and investments, and can compete fairly. The results have been spectacular. Economic benefits made possible because of copyright and related rights laws are evident in each of these industries; there has been measurable growth and development; an ever-expanding range of products and services; greatly enhanced creativity and innovation; and hope about the future, and the ability to tackle and satisfactorily resolve any and all problems.

- 1 Melville B. Nimmer and David Nimmer, **Nimmer On Copyright** (New York: Matthew Bender & Company, 2000), 2-6 to 2-30. See also Berne Convention, Articles 2(1) and 2(2); TRIPS Agreement Article 9(2).
- 2 See Berne Convention, Article 5(2).
- 3 *International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (Rome Convention)* (1961).
- 4 Shahid Alikhan, **Socio-Economic Benefits of Intellectual Property Protection in Developing Countries** (Geneva: WIPO, 2000): 50, 56.
- 5 **Copyright Industries in the U.S. Economy: The 2000 Report** (Washington D.C.: International Intellectual Property Alliance, 2000).
- 6 *Address of the Honorable John Luxton, Minister of Commerce and Industry, New Zealand, September 9, 1997.*
- 7 Luis Stolovich, Graciela Lescana, and José Mourelle, **La Cultura Da Trabajo** (Montevideo: Fin de Siglo, 1997).
- 8 Alikhan, **Socio-Economic Benefits of Intellectual Property Protection in Developing Countries**: 69.
- 9 Note that a musical composition may also be a “joint work” of more than one author or a “work made for hire” where the work is owned by the creator’s employer.
- 10 <http://www.geocities.com>
- 11 *International Federation of the Phonographic Industry, World Sales of Recorded Music, 1999* (<http://www.ifpi.org/statistics>).
- 12 **Irish Times**, February 16, 2000. See also <http://acusd.edu/gen/recording>; www.ifpi.org; www.duke.edu.
- 13 **Independent** (London), February 8, 1999.
- 14 Statistics by IFPI – <http://www.ifpi.org>
- 15 Composers and music publishers also derive income from other forms of exploitation of their various assets, such as directly from the musical compositions which they own (for example, public performance income from television and radio), and from the licensing of recordings for advertisements, motion pictures, and other creative uses for which fees are paid.

- 16 **Asian Wall Street Journal**, January 28, 2000; **Mainichi Daily News**, January 14, 2000; **Boston Globe**, November 21, 1999.
- 17 **New York Times**, October 3, 1999.
- 18 <http://www.music365.fr>
- 19 <http://www.ark21.com/chebmami>; <http://www.cnn.com>
- 20 <http://www.isis-imtl.com>; <http://www.africana.com>; **New York Times**, June 24, 1998.
- 21 **Independent** (London), February 14, 2000.
- 22 <http://www.nwlink.com>
- 23 <http://www.unesco.org>
- 24 http://www.wipo.int/about-ip/en/index.html?wipo_content_frame=/about-ip/en/copyright.html
- 25 <http://www.prs.co.uk>
- 26 <http://www.jasrac.com>
- 27 <http://www.bmi.com>
- 28 <http://www.ascap.com>
- 29 <http://www.sesac.com/>
- 30 <http://www.nmpa.org/nmpa.html>
- 31 <http://www.dictionary.msn.com>
- 32 **Los Angeles Times**, June 22, 28, 2000; **M2 Presswire**, July 28, 2000.
- 33 See Berne Convention, Articles 2(1) and 14bis.
- 34 See Berne Convention, Article 14bis(2) and (3).
- 35 For example, the characters in the *Star Wars* and *ET* movies created whole industries and enormous revenue from the manufacture and sale of products based on them.

- 36 Mercedes reportedly paid a considerable sum for its vehicle to appear in **The Lost World**; as did Nokia and BMW, which were prominently featured in the latest James Bond movies. See <http://www.vanguardngr.com>
- 37 <http://asia.cnn.com>
- 38 The importance of book publishing in respect to education was recognized in the appendix to the Berne Convention, which provides developing countries with a mechanism for compulsory licensing (in respect to the rights of translation and reproduction) of books deemed necessary to their economic, educational, or cultural interests.
- 39 Donald T. Hawkins, "Electronic books: A Major Publishing Revolution," Online 24, No. 4 (July/August 2000). See also <http://www.ipa.org/statistics>
- 40 <http://www.unescostat.unesco.org>
- 41 **Kiplinger's Personal Finance Magazine**, November, 2000.
- 42 <http://www.britannica.com> (personal computer)
- 43 <http://www.softwaremag.com>
- 44 It was confirmed in the TRIPS Agreement, Article 10(1) of which says "Computer programs, whether in source or object code, shall be protected as literary works under the Berne Convention."
- 45 Gregory J. Kirsh, "The Changing Role of Patent and Copyright Protection for Software" – <http://www.gigalaw.com>; see TRIPS Agreement, Article 9(2).
- 46 The United States Federal Court of Appeals, in the landmark case of **State Street Bank vs Signature Financial Group** (149 F.3d 1368), ruled that a new method of doing business, which involved or centered around computer software, was subject to patent protection (for further discussion on this issue see Chapter 4).
- 47 Operating systems tell the computer hardware what to do to make it work, to accept applications and programs, and in general, make the unit interface with the user.
- 48 Its leading proponent is Linus Torvalds, who created the basis for the Linux operating system.
- 49 **Independent**, August 23, 2000; **Irish Times**, April 23, 1999; **Computerworld**, January 26, 1998.

- 50 <http://www.opensource.org>
- 51 <http://www.intellectualcapital.com>
- 52 <http://www.opensource.org>; see also the IBM Public License for its open source software (<http://www.ibm.com>), and the Mozilla Public License (<http://www.mozilla.org>).
- 53 <http://www.itaa.org>
- 54 <http://www.stardock.net>
- 55 <http://www.salon.com>; <http://www.bsa.org>
- 56 <http://www.law.com>
- 57 **Wall Street Journal**, June 13, 2000; <http://www.guardianunlimited.co.uk>
- 58 <http://www.gameboy.com>
- 59 <http://www.guardianunlimited.co.uk>; **New York Times**, "Microsoft's Game Plan," September 4, 2000; <http://www.cnn.com>
- 60 **Economist** (London), October 7, 2000.
- 61 Dean Takahashi, "Myst Opportunity," **Upside** (January, 1999).
- 62 <http://www.guardianunlimited.co.uk>; **Stereo Review's Sound & Vision**, January 2000.
- 63 <http://www.idsa.com>
- 64 See for example, the United States Copyright Act, at 17 USC 1001 et seq.
- 65 Nicholas Negroponte, **Being Digital** (New York: Alfred A. Knopf, 1995): 4.
- 66 **Economist**, October 7, 2000.
- 67 WCT, article 11; WPPT, article 18.
- 68 Donald T. Hawkins, **New York Times**, July 2, 1998.
- 69 **New York Times**, July 18, 2000.

- 70 **Wall Street Journal**, July 3, 2000.
- 71 WCT Agreed Statement 1; WPPT Agreed Statement 6.
- 72 <http://www.gltreach.com/globstats>
- 73 <http://www.salon.com>. Recent headlines indicate that the foregoing business model is growing in acceptance. The Recording Industry Association of America (RIAA) has formed a pool to collect royalties from webcasters who stream music online. At the 2000 World Congress of the International Confederation of Societies of Authors and Composers, the organization which looks after the interests of those connected to musical compositions, agreements were entered into for the collection of licensing income generated by the use of music (musical compositions) on the Internet, including webcasting, streaming, and music on-demand situations (<http://www.CISAC.org>; <http://www.RIAA.com>). As of July 8, 2002, the Copyright Arbitration Royalty Panel (CARP) in the United States of America promulgated a final Decision (part 201 of 37 CFR) setting terms for fees and compulsory licenses for use of musical works on the Internet (see: http://www.copyright.gov/carp/webcast_regs.html).
- 74 **New York Times**, February 23, 2002, *Napster Wins One Round in Music Case*, Matt Richtel
- 75 See, DOI Project, <http://www.doi.org>
- 76 **American Journalism Review**, September 1999, June 2000; **Independent**, August 24, 1999; **Editor & Publisher**, February 20, 1999; **Guardian**, April 10, 2000; **New York Times**, October 4, 1999.
- 77 The Secure Digital Music Initiative (SDMI) has been working on the standardization of the technology to be used in audio material. For further technical details about steganography, see **Business2.com**, February 6, 2000: 56; <http://www.jjtc.co/steganography>
- 78 **New York Times**, July 14, 16, and 18, 2000; <http://www.salon.com>; <http://www.cnn.com>

CHAPTER 7

TRADITIONAL KNOWLEDGE

In previous chapters, the contribution made by intellectual property to the economy has been discussed, including the function of conventional types of intellectual property such as industrial property and copyright. The primary focus is the protection of inventions and creations which are the product of human intellectual activity in the industrial, scientific, literary, or artistic fields. The focus of this chapter is on the relationship between intellectual property and the sustainable economic development of countries which are rich in traditional knowledge. The term “traditional knowledge” is one of several terms to describe broadly the same subject matter. Other terms include “indigenous culture and intellectual property”, “indigenous heritage” and “customary heritage rights”. WIPO currently uses the term “traditional knowledge” (referred to as TK in this chapter) to refer to tradition-based (i.e. generally transmitted from generation to generation, generally pertaining to a particular people or its territory, and constantly evolving in response to a changing environment) innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields.¹ Until quite recently, TK assets have been largely overlooked in the IP community and in this sense, they are traditional but new intellectual assets, and their economic value will be shown by presenting relevant statistics. Using a number of case studies and facts, this chapter will also discuss how intellectual property could further enhance the value of TK and bring more economic benefits to the relevant stakeholders.

POTENTIAL VALUE

Traditional knowledge assets are important sources of income, food, and healthcare for large parts of populations, particularly, but not only, in developing countries (see Box - 7.1). According to the World Health Organization (WHO), up to 80 percent of the world's population depends upon traditional medicine for its primary health needs.² In India, for example, there are 600,000 licensed medical practitioners of classical traditional health systems and over one million community-based traditional health workers.³

Studies of local communities also provide evidence that the conservation and use of traditional knowledge can provide significant environmental benefits. Age-old farming and land-use practices have promoted diet

diversity, income generation, production stability, minimization of risk, reduced insect and disease incidence, efficient use of labor, intensification of production with limited resources, and maximization of returns with low levels of technology.⁴

Though this book is intended to focus on the economic dimension of intellectual property, it is worth pointing out that traditional knowledge is also important for social and cultural reasons, particularly in developing and least developed countries. It can play a role in the economic and social organization of those countries, and recognizing the value of such knowledge may be a viable means of promoting a sense of national cohesion and identity. Indigenous and local communities often stress the importance of the conservation, validation, and protection of traditional knowledge for individual and community dignity and respect.

BOX-7.1 TRADITIONAL KNOWLEDGE AS A SOURCE OF FOOD

Traditional knowledge remains the basis of local food production in many developing countries. According to Lazare Sehoueto, Kilimanjaro Institute, Benin: "Local knowledge is the principle knowledge resource for small-scale farmers who represent 70 percent to 90 percent of agricultural producers and more than 60 percent of the population of sub-Saharan Africa."

Source: Douglas Nakashima, Lyndel Prott, and Peter Bridgewater, "Tapping Into the World's Wisdom," UNESCO Sources 125 (July-August 2000): 11.

Traditional knowledge can be associated with certain genetic resources. With the emergence of modern biotechnologies, genetic resources have assumed increasing economic, scientific, and commercial value to a wide range of stakeholders (for further information, see Chapter 4 on patent protection of biological inventions). Other tradition-based creations, such as expressions of folklore, have also taken on new economic and cultural significance within a globalized information society, particularly as a result of the Internet (see Chapter 3). Thus, access to those resources with which traditional knowledge is associated can provide substantial benefits to society through their contribution to advances in the pharmaceutical, biotechnological, agricultural,

chemical, and other fields. Tradition-based innovations and creations, including expressions of folklore, which are important parts of a community's heritage and cultural patrimony, can act as inputs into other markets, such as entertainment, art, tourism, architecture, and fashion.

For developing countries especially, commercialization of tradition-based innovations and creations, if so desired by the relevant communities, can bring economic benefits, play a part in creating new trading opportunities, and contribute to sustainable economic development. For countries rich in traditional knowledge, the protection, promotion, and development of such knowledge can add to their competitive advantage. The long-term sustainable development of indigenous and local communities depends, at least to some degree, on the communities' abilities to harness their traditional and local technologies⁵ (see Box - 7.2).

BOX-7.2 BRAZILIAN INDIGENOUS COMMUNITY: "WE MUST LEARN HOW TO TRADE"

The Yawanawa, an Amazonian indigenous community in Brazil, have for generations cultivated a plant called uruku, which produces a natural red pigment. Estée Lauder now uses the plant to produce lipsticks. In 1998, the community earned US\$12,000, which they used to build a new village and, with the help of Estée Lauder, a new hospital. In the words of the community's head: "We must learn how to trade. Today, with the globalization booming, if we are not competitive and, at the same time, we do not succeed in preserving our language and traditions, we'll be swept away."

Source: Sette, Supplement to Corriere della Sera, November 2000.

Intellectual property issues have arisen in numerous forums dealing with diverse policy areas, such as food and agriculture, biological diversity, culture, biotechnology and human rights (see Box - 7.3).

BOX-7.3 INTELLECTUAL PROPERTY AND HUMAN RIGHTS

The relationship between intellectual property and human rights is complex and significant. IPRs are recognized as a human right in the Universal Declaration of Human Rights, 1948, and other international and regional human rights treaties and instruments. At the same time, it is suggested by some that conflicts may exist between respect for intellectual property and respect for other human rights, such as the right to adequate health care, to education, to a share in the benefits of scientific progress, and to participation in cultural life.

The relevance of intellectual property to these questions should, of course, not be overstated. The task at hand is to identify, very precisely, the points of contact between intellectual property and economic development based upon TK. The relationship between these two elements and the preservation, protection, development, and utilization of TK is deeply complex. What role does present intellectual property law and policy play in the preservation, sustainable use and protection of TK? Do intellectual property rights help or hinder the furtherance of policy objectives in biodiversity conservation, cultural heritage preservation and indigenous peoples' rights? In what ways might intellectual property rights not be suitable for protecting TK (for example, cultural expressions)? The interface between intellectual property and TK requires a technical engagement, embodying a full understanding of the IP system and of the needs and expectations of TK holders.

To this end, WIPO has in recent years embarked on an extensive study of the IP aspects of access to and benefit-sharing in genetic resources and the protection of TK and folklore. The activities of WIPO since 1998 have included wide-ranging fact-finding, research, awareness-raising, and consultations among and with indigenous peoples and local communities, governments, the private sector, civil society, and other key stakeholders. Much of the information in this chapter is derived from the results of the work of WIPO to date.

THE NATURE OF TRADITIONAL KNOWLEDGE

The context in which traditional knowledge is generated and preserved is important to its nature and content. Therefore, only certain general observations can be made.

Traditional knowledge is not limited to any specific field of technology or the arts. Systems of TK in the fields of medicine and healing, biodiversity conservation, the environment, and food and agriculture are well known. Other key components of TK are the music, dance, and folk arts (that is, designs, textiles, plastic arts, crafts, and so on) of a people. Therefore, TK encompasses a broad range of subject matter which includes: agricultural, scientific, technical, ecological, medicinal (including related medicines and remedies), and biodiversity-related knowledge; expressions of folklore in the form of music, dance, song, handicrafts, designs, stories, and artwork; elements of languages, such as names, geographical indications, and symbols; and moveable cultural properties.

Although there are works which may be created purely to satisfy the aesthetic will of the artisan, many are symbolic of a deeper order or belief system. When a traditional singer performs a song, the cadence, melody, and form all follow rules maintained for generations. Thus, a song's performance entertains and educates the current audience, and also unites the current population with the past.

Understanding the interplay between practical knowledge, social history, art, and spiritual or religious beliefs provides a valuable foundation for developing an understanding of the people who hold this knowledge. While modern arts and sciences often place individual accomplishment over community development, TK systems celebrate the community's cooperative effort.

Intertwined within practical solutions, TK often transmits the history, beliefs, aesthetics, ethics, and traditions of a particular people. For example, plants used for medicinal purposes also often have symbolic value for the community. Many sculptures, paintings, and crafts are created according to strict rituals and traditions because of their profound symbolic or religious meaning.

Traditional knowledge is a multifaceted concept. Products which result from it may not be produced systematically but in accordance with the individual or collective creators' responses to and interaction with their cultural environment. In addition, TK, as representative of cultural values, is generally held collectively. Thus, what can sometimes be perceived as an isolated piece of literature (a poem, for example) or an isolated invention (the use of a plant resource to heal wounds, for instance) is actually an element that integrates a vast and mostly coherent complex of beliefs and knowledge, control of which is not in the hands of individuals who use isolated pieces of knowledge, but is vested in the community or collective. Furthermore, most TK is transmitted orally from generation to generation, and remains largely undocumented.

A fundamentally important aspect of traditional knowledge is that it is traditional only to the extent that its creation and use are part of the cultural traditions of communities. Traditional, therefore, does not necessarily mean that the knowledge is ancient or static, but that it evolves as a response of individuals and communities to the challenges posed by their social environment: "Traditional knowledge is not merely learned by rote and handed down from one generation to the next. Inherently dynamic, it is subject to a continuous process of verification, adaptation and creation, altering its form and content in response to changing environmental and social circumstances."⁶

Thus, traditional knowledge is also contemporary knowledge. It is, therefore, not only desirable to develop a system that documents and preserves TK created in the past and which may be on the brink of disappearance, it is also important to envisage a system that contributes to the promotion and dissemination of innovations which are based on continuing use of tradition. One is not talking about freezing and preserving knowledge as it exists now, but about preserving what exists as an indispensable and powerful tool for fostering continued traditional innovation and creativity.

Intellectual property issues related to TK cut across the conventional branches of IP law, such as copyright and industrial property. In many cases, TK holders do not separate the artistic from the useful aspects of their intellectual creations and innovations; rather, both emanate from a single belief system which is expressed in daily life and ritual.

THE ECONOMIC BENEFIT

The long-term sustainable development of indigenous and local communities depends, at least to some degree, on their ability to harness their traditional knowledge for their economic benefit. On another level, biodiversity and the TK associated with using their genetic resources in a sustainable manner, are a comparative advantage for those countries that are biodiversity-rich, enabling them to participate more effectively in global markets and perhaps rise above current levels of poverty and deprivation. Hence, protection of TK at national and international levels may be seen as a potentially powerful tool for advancing the integration of developing and least developed countries into the global economy.

THE COMMERCIAL VALUE OF GENETIC RESOURCES AND TK IN THE NATURAL RESOURCE-BASED INDUSTRIES⁷

There is considerable commercial interest in TK of plant and animal species for food, medicine, and other purposes. Certain genetic resources with which TK is associated can provide significant input into other markets, such as pharmaceuticals, cosmetics and personal care, agriculture, food additives, industrial enzymes and biopesticides.

PHARMACEUTICALS

The value of traditional knowledge, for example in identifying plants from which medicinally useful compounds can be extracted or synthesized, has long been known. In the United States of America, it is estimated that nine out of ten prescription drugs used are based on natural compounds from plants, fungi, animals, and microorganisms, that is, they are based on the products of biodiversity.⁸ It has also been estimated that the total market value of plant-derived medicines sold in OECD countries in 1985 was US\$43 billion.⁹

NATURAL THERAPY/HERBAL REMEDY INDUSTRIES

The world-wide market for natural therapies, which draw upon sources as varied as Chinese, Western, and Ayurvedic herbs and plant-based remedies, rivals that of the pharmaceutical industry. Brand names like Nu-life™, Efamol™, Nutripur™, Vita™, Nature Harmony™, Greens+™, Sisu™, and Nutisana™, to name a few, attest to the popularity of such remedies. Natural therapies are promoted for weight loss or gain, body-building, insomnia, cellulite control, menopause, skin care, digestive aids, relaxants, laxatives, and so on. Extracts, oils, and essences from ginkgo biloba, grape seed, kelp, kava, ginseng, turmeric, evening primrose, horse chestnut seed, hawthorn, St. John's wort, juniper, rosemary (a mere fraction of possible ingredients) are mixed in all manner of combinations to create pills, creams, drinks, teas, and lotions to provide relief for various ailments (see Box - 7.4).

BOX-7.4 CRAB OIL: A PROMISING NON-TIMBER FOREST PRODUCT FOR GUYANA

Crabwood is one of the most common species of hardwood found in the Iwokrama Forest, Guyana. The tree's seeds are used to make crab oil. Mixed with honey, or taken in concentrated form, crab oil is said to be useful for easing coughs due to colds and soothing asthmatic episodes. Brittle hair can also be cured with regular treatment using this oil. When rubbed on the skin, crab oil is thought to soothe bruises, swollen and sore muscles, arthritic joints and minor skin irritations and also acts as an insect repellent. The Iwokrama International Centre for Rain Forest Conservation and Development is working with other partners to assess the ecological, social, and economic aspects of production and commercialization of crab oil.

Source: *Iwokrama Bulletin* 4, No. 1 (August 2000), 8.

Part of the huge world market for herbal medicines is based on TK. According to the WHO, traditional medicine has maintained its popularity in a number of Asian countries, such as China, India, Japan, and Pakistan. In China, for example, traditional medicines (herbal preparations) account for 30 percent to 50 percent of total medicinal consumption. In 1993, the total sales of herbal medicines amounted to more than US\$2.5 billion. Globally, about 80 percent of the human population relies on traditional medical systems, and about 85 percent of traditional medicine involves the use of plant extracts.

COSMETICS AND PERSONAL CARE INDUSTRY

Another industry with a huge international market to which traditional communities make substantial contributions is cosmetics and personal care products. Extracts from traditionally used plant species such as aloe-vera, jojoba, and tea-tree now provide the bases for a wide range of products, such as essential oils, aromas, soaps, skin-care products, and shampoos (see Box - 7.5).

BOX-7.5 BOTTLING ANCIENT SECRETS

As India has opened its economy over the past decades, companies like L'Oréal and Revlon have successfully imported Western-developed antiwrinkle creams and shampoos previously available only on the black market. Now, predictably perhaps, traditional Indian beauty treatments based on the ancient principles of Ayurveda are winning converts in the West. Though these practices have been around for 5,000 years, they are new in the United States of America, and that is enough to inspire women once content to describe their skin as dry or oily to discover whether their dosha – or spiritual energy – can best be classified as kapha (earth), vata (air), or pitta (fire).

Ayurveda (Sanskrit for wisdom of life) is purported to be the oldest holistic approach to health and well-being. The basic principle states that each person is governed by the three doshas of kapha, vata, or pitta. Though everyone has a dominant dosha, which influences everything from skin type to personality, keeping all three in balance is the

key to inner health and outer beauty. Yoga is one element of Ayurveda, and its popularity in the United States of America has led to greater interest in Eastern spiritualism and increased opportunities for Western marketing.

In March 1999, the Body Shop introduced a line of Ayurvedic-inspired products (such as a pillow spray for kaphas), and in October 1999 a three-woman team, including model Christine Turlington, launched the upscale skin-care regimen Sundari™. Both lines use essential oils and herbs cultivated predominantly in India. Says Sundari co-founder Ayla Hussain, who grew up in Pakistan and attended Harvard Business School: "We take ideas that are thousands of years old and use modern technology to maximize their efficacy." Lindsay Oliver, manager of an Ayurvedic spa called Raj in Fairfield, Iowa, says that when the resort opened seven years ago, she couldn't get magazines interested. Now, she reports, "Vogue calls us."

Source: M. Orecklin, 2000, quoted in Graham Dutfield and Henrietta Marrie, *op. cit.*

FOOD AND BEVERAGES

Many of the largest food and beverage manufacturers are embellishing their products with traditional herbal medicines. The market for functional beverages – drinks that promise health benefits beyond their inherent nutritional value – has nearly doubled in the last four years, from US\$ 2.6 billion in 1997 to US\$ 4.7 billion in 2000. Sales of functional foods have followed suit, and both categories are expected to continue to grow.¹⁰

VETERINARY CARE PRODUCTS

Traditional communities have over the millennia depended for their survival on a range of animals, birds, and fish. In some cases they domesticated certain species. Caring for and maintaining the health of the fauna on which they depended was therefore very important. As they developed remedies for their sick animals, they also developed knowledge

about various remedies to help their livestock produce more, about what pastures or fodder gave their meat the best flavour, and how to protect their animals against various parasites.

Today, there is a huge market for veterinary-care products targeting both a range of commercial species which supply meat, eggs, and milk products, as well as domestic pets. As with the pharmaceutical and natural product industries, traditional knowledge is a useful source for the development of a wide range of such products (see Box - 7.6)

BOX-7.6 TRADITIONAL VETERINARY MEDICINE

In Vembur village, Tamil Nadu, India, there is a man by the name of Thiru Palchamy Gounder who has been curing animals since he was sixteen. Developing his trade under the guidance of his guru, Kandavilswamy, this traditional veterinarian has gained fame within his region for being able to cure a variety of bovine ailments. Using medications developed from local plants, he is able to treat such common maladies as fractures, abscesses, broken horns, swollen tongues, and swollen faces. The treatments can last from two hours to a month, but the continued demand for these services provides little doubt as to their efficacy.

Associations of grassroots innovators are compiling such traditional knowledge to save it from disappearance, to promote respect and protection for it, to disseminate it, and to add value to it through research. They see this as a possible avenue for a bottom-up approach to development. Some associations hope to market TK-based products, after obtaining patent protection, for the benefit of the communities and innovators who have developed this knowledge.

Sources: "Keeping Knowledge Alive: Gounder's Cattle Cures," Honey Bee 9 No. 4 (October-December, 1998) and WIPO South Asia Fact-Finding Mission, 1998.

THE COMMERCIAL VALUE OF TK IN THE CULTURAL INDUSTRIES

The commercial value of TK in relation to cultural industries¹¹ tends to be concentrated in arts and crafts, cultural tourism, music, multi-media and publishing, architecture, and fashion. Unfortunately, very little economic data exist on the value of the contribution of traditional knowledge to these industries. Information and examples are found mainly in Australia, Canada, New Zealand, and the United States of America.

The arts and crafts industry comprises three broad sectors that have implications for both the survival of TK as well as its protection. These sectors are:

- Souvenir arts and crafts (memorabilia) primarily intended for the tourism industry;
- Traditional art produced as fine art for public and private collections;
- Cultural property, consisting largely of traditional ceremonial items, which are traded through auction houses for connoisseur collectors and investors.

Traditional souvenir arts generally consist of robust, portable, and cheap memorabilia and are typically found in the airports and shopping malls of major tourist venues. While some of these objects – small paintings, woven baskets, carved figures – are made by traditional artisans, many are not. Many of the tourist objects are mass-produced, employing generic traditional art styles on such non-traditional items as t-shirts, tea-towels, place mats, playing cards, sarongs, post-cards, drink coasters and coolers, calendars, computer mouse pads, and so on. Sometimes traditional designs are used under licence, but most are not.

In terms of IP issues, of the three market sectors identified above, it is the traditional souvenir market that is most open to abuse. Because the designs applied to such items as tea-towels are most often generic, they do not constitute an abuse of a particular traditional artist's work. In cases where rock or cave paintings are used, these images may be thousands

of years old yet still remain the sacred heritage of a particular people. Because of their age and the impossibility of attribution, they are not protectable, for example, by copyright law. In addition, competition from this market in counterfeit art deprives traditional artisans of economic benefits they might otherwise have had by selling their own genuine creations (see Box - 7.7).

In so far as fine art is concerned, during the 1960s and 1970s, traditional arts in many countries made the transition from artifact to art in the largely European-dominated world of fine art. Today, traditional art is a million-dollar business. Traditional artworks came to be considered worthy of the permanent collections of the principal fine art museums of countries around the world, attracting prices to match their new-found status.

BOX-7.7 AUSTRALIAN ABORIGINAL ART IN THE SOUVENIR MARKET

The National Aboriginal and Torres Strait Islander Cultural Industry Strategy estimated the indigenous arts and crafts market to be worth almost US\$200 million per year.

The percentage of returns to indigenous people is marginal. In 1989, the *Review of the Arts and Crafts Industry* estimated that indigenous people receive just over US\$7 million per year from the sale of art and crafts. The Strategy notes that the economic benefits to indigenous artists have improved and could now be about US\$50 million per year, but the major portion of sales benefits goes to the art traders rather than to the artists themselves.

Furthermore, no accurate statistics have been prepared on the financial implications of activities such as pirating indigenous arts and crafts and the unauthorized reproduction of indigenous arts and crafts outside national boundaries.

Source: *Graham Dutfield and Henrietta Marrie, op. cit.*

Music is a vibrant and important part of traditional life (see Chapter 6). Traditional music has in recent years captured the public's imagination. Technological breakthroughs in recording techniques, the rise of the music industry and the thirst for world music are combining to create an immense market for new, diverse sounds. Paul Simon's *Graceland*, in 1986, and *Rhythm of the Saints*, in 1990, using African and Latin American music, respectively, revealed the excellent results possible when Western musicians incorporate non-Western music into their songs. *Graceland* spent 31 weeks on the *Billboard* top album list and has sold over 3.5 million copies world-wide.¹² *Rhythm of the Saints* sold 1.3 million copies in the first four weeks of its release alone¹³ (see Box - 7.8). However, traditional music, often without any IP protection, is vulnerable in today's commercial music world.

BOX-7.8 MUSIC FROM TUVA

Tuva, a region within Russia, had until recently little if no contact with the outside world. That changed when Tuvan folk music was recorded and exported in 1990. Since then 23 compact discs of Tuvan music have been released. None of these recordings was recorded in Tuva itself, and none is commercially available there. Rather, they serve the growing world music market.

Source: T. Levin, "A Tale of Tuva," (paper read at meeting of the Society for Ethnomusicology, Los Angeles, California, October 20, 1995).

THE COMMERCIAL VALUE OF TK: CONCLUSION

Estimating the full value of TK in monetary terms is difficult if not impossible. First, it is often an essential component in the development of other products. Second, as many TK-derived products never enter modern markets, they are excluded from sectoral or GNP indices. However, if those who depend on TK-derived products were deprived of them (for example, herbal medicines), the cost of replacing them through purchases of substitutes in the market would probably be quite high, particularly as a portion of their incomes. Third, a great deal of traditional knowledge is likely to have cultural or spiritual value that cannot be quantified.¹⁴

While global trade is measured in trillions of US dollars, the contribution of TK can perhaps at least be measured in billions. The largest contributions are made in natural resource-based sectors involving agriculture, pharmaceuticals, botanical medicines, natural products, and food and beverages. A general estimate of global trade based on selected categories of products derived from genetic resources is provided by authors ten Kate and Laird in *The Commercial Use of Biodiversity* (see Table - 7.9). Estimates of the economic value of contributions from TK to these categories vary as statistical data are not uniformly kept by all countries.

TABLE-7.9 ESTIMATES FOR ANNUAL MARKETS OF PRODUCTS DEVELOPED FROM GENETIC RESOURCES¹⁵

Sector	Market (US\$ bn) Low	Market (US\$ bn) High	Extent to which products are derived from genetic resources
Pharmaceuticals	75	150	Some products derived from genetic resources. Low estimate: natural products form 25% of global market. High estimate: 50%.
Botanical medicines	20	40	All products derived from genetic resources. Low estimate: includes global botanical medicine markets. High estimate: includes botanical medicines, minerals, and vitamins.
Agricultural produce (commercial sales of agricultural seed)	300+(30)	450+(30)	All products derived from genetic resources. Low estimate: final value of produce reaching consumer 10x commercial sales of seed to farmers. High estimate: 15x commercial sales of seed to farmers.
Ornamental horticultural products	16	19	All products derived from genetic resources. Low estimate: based on available data. High estimate: allows for unreported sales and products.
Crop protection products	0.6	3	Some products derived from genetic resources. High estimate includes wholly synthesized analogues as well as semi-synthetic products.
Biotechnology in fields other than healthcare and agriculture	60	120	Some products derived from genetic resources. Low and high estimates: based on assessments of environmental biotechnologies.
Personal care and cosmetic products	2.8	2.8	Some products derived from genetic resources. Low and high estimates: reflect natural component of the market.
Rounded total	500	800	

THREATS TO THE MAINTENANCE AND SURVIVAL OF TK

Holders of TK are faced with a variety of difficulties. However, not all of them can be addressed by intellectual property. A serious problem is the reluctance of the younger generation to learn the old ways. The rejection of traditions by the young and the encroachment of modern ways of life often result in the decline of traditional knowledge and practices. Either through acculturation or diffusion, many traditional practices are lost. Thus, a primary need expressed by many TK holders is to document and preserve the knowledge that is held by elders and communities throughout the world. The absence of willing heirs to this knowledge has led to the precarious situation where the death of a TK holder can result in the demise of an entire tradition and knowledge system.

Another difficulty facing holders of TK is lack of respect and appreciation. The true understanding of the value of TK is often overlooked within the modern reductionist approach to science. Unless information is developed under aseptic clinical conditions by scientific methods, it is sometimes viewed as “inferior”. This is a corollary to the “nih” syndrome in evidence in some corporate research and development departments to reject ideas or inventions that are “not invented here.” For example, when a traditional healer provides a mixture of herbs to cure an illness, the healer may not describe the effects on the body as molecular interactions in terms of modern biochemistry, but the healer bases his “prescription” upon generations of “clinical” trials undertaken by healers before him.

At times, modern society has displayed a prejudice against TK, since it does not conform to accepted methods of learning. Some vernacular references to it carry negative connotations, denigrating traditional medicine and its practitioners.

Yet another problem confronting holders of TK is the commercial exploitation of their knowledge by others, which raises the question of legal protection. Cases involving artistic designs, such as the Morning Star Pole in Australia, and natural products, such as oil from the neem tree in large parts of Asia, Africa, and Latin America, all bear witness to the value of TK

in the modern global economy. Unfortunately, many commercial interactions between traditional communities and private corporations can result in agreements from which legal uncertainty and consequent imperfection or loss of rights arise for both parties. A lack of experience with existing formal systems, economic dependency, lack of a unified voice, and in many cases, a lack of clear national policy concerning the utilization of TK, result in traditional communities being placed at a decided disadvantage. On the other hand, the lack of clear rules protecting TK creates risks for business interests, which prefer closing deals under well-established, reliable, and enforceable rules.

THE RIGHT TO OWN AND CONTROL

Traditional knowledge may be communally owned or held by a small number of individuals or a single person. Whichever the case, holders and their communities may continue to have a strong interest in how such knowledge is used by others even after it has been disclosed publicly and has fallen into the public domain.

When the knowledge of a traditional community is passed on to an outsider who subsequently publishes it, it becomes difficult for the community to control how the knowledge is used and who else can acquire it. Not only can it be used freely by anyone, but it may be exploited for commercial purposes. In particular, the unauthorized disclosure of secret or sacred knowledge can cause enormous distress.

THE RIGHT TO PREVENT OR CONTROL COMMERCIAL USE

Collections of plants and other biological material for academic purposes may be open to commercial exploitation. Neither source communities nor academic researchers may be aware that a commercial product has been developed based on material or information in such a collection. Academic literature is commonly consulted by industry researchers, and valuable knowledge (such as ethnobotanical information) can quietly become part of the R&D efforts of commercial enterprises. Such activities by researchers are entirely legitimate, unless TK in the collection or literature is legally protected.

THE RIGHT TO BENEFIT COMMERCIALY

For many, if not most, communities, the application of TK to their livelihood enables them to generate income. In even the remotest areas, communities and community members are part of the money economy and need cash to purchase goods necessary for survival. Given the commercial possibilities of at least some traditional knowledge, only a tiny share of the full benefits may reach the communities providing knowledge utilized in the development of new products.

Sometimes, traditional communities find their ability to benefit commercially from their knowledge is restricted by regulations imposed upon them from outside. For example, they may find, as the Kani people of South India did, that they were for a while unable to harvest medicinal plants to sell because they inhabit a protected area (see Box - 7.10).

BOX-7.10 JEEVANI AND THE KANI TRIBES

The Kani belong to a traditionally nomadic community, who now lead a primarily settled life in the forests of the Western Ghats (a mountain range along south-western India) in the Thiruvananthapuram district of Kerala. The Kanis, numbering around 16,000, live in several tribal hamlets, each consisting of 10 to 20 families dispersed in and around the forest areas of that district. The Kanis do not constitute a cohesive unit, although they do share certain common characteristics and practices. Kanis are the traditional collectors of non-timber forest products. Living close to nature, the Kanis have acquired unique knowledge about the use of the resources, particularly the biological resources, around them.

In December 1987, a team of scientists working on the All India Co-ordinated Research Project on Ethnobiology (AICRPE) led by Dr. P. Pushpangadan was trekking through the tropical forests of the Agasthyar hills, surveying the Kani tribal settlements. After a while the team became very tired but the Kani acting as their guides remained surprisingly energetic and agile. They would occasionally munch some small blackish fruits. One of them offered a few of these fruits to the

team pointing out that if they ate those, they could go on trekking without fatigue; and the AICRPE team found this was true. It was later that the Kani tribesmen introduced the scientists to the "magical" plant, which was subsequently identified as *Trichopus zeylanicus* ssp. *travancoricus*.

Detailed chemical and pharmacological investigations showed that the leaf of the plant contained various glycolipids and some other non-steroidal compounds with profound adaptogenic and immunoenhancing properties. The fruits showed mainly anti-fatigue properties. The Tropical Botanical Garden Research Institute (TBGRI) was successful in developing a scientifically validated and standardized herbal drug, based on the tribal lead. The drug was called Jeevani and was released for commercial production in 1995 by Arya Vaidya Pharmacy. While transferring the technology for production of the drug to the pharmaceutical firm, the TBGRI agreed to share the license fee and royalty with the tribal community on a fifty-fifty basis.

The prime concern of the Kani in the beginning was to evolve a viable mechanism for receiving such funds. With the help of the TBGRI, some government officials and NGOs, the Kani formed a registered trust. About 60 percent of the Kani families of Kerala are members of this trust. From February 1999, the amount due to them has been transferred to the Trust with an understanding that the interest accrued from this amount should be used for the welfare activities of the Kani tribe.

The TBGRI has trained 25 tribal families to cultivate the plant around their dwellings in the forest. In the first year, each family earned about Rs.8,000 on the sale of leaves from the cultivation of *Trichopus zeylanicus* in a half-hectare area. Unfortunately, the Forest Department objected to the cultivation because the families may remove plants from the natural population of this species in the forests, thereby endangering it. It is understood that this problem has now been resolved and the Forest Department has recently approved the cultivation of this plant.

THE RIGHT TO BE ACKNOWLEDGED AND ATTRIBUTED

Failure to acknowledge sources of information is an issue about which some traditional communities have become concerned. Sometimes such problems can be solved easily by making local people principal or co-authors of papers and books, or co-producers of films and videos. Another common outcome of publication is that, even though the book or research report resulted from information provided freely by TK holders, the researcher, writer, publishing company, or sponsor of the research claims copyright. Government or university sponsors often justify holding copyright because public funds were used to support the research project.

THE RIGHT TO PREVENT DEROGATORY, OFFENSIVE, AND FALLACIOUS USE

Traditional cultural expressions such as dances and musical performances are sometimes performed outside their proper context in ways which may be offensive to the original performers and their communities and which may open them up to the ridicule of members of the wider society. Sometimes it is community members themselves that through poverty or coercion carry out performances in ways that they themselves find degrading. However, in many cases, such offensive and derogatory performances are unauthorized productions carried out by people from outside the community.

Another problem is that sacred symbols may be copied and used on products that are completely inappropriate. A good example of this is presented by an Australian case in which a carpet-manufacturing firm reproduced the sacred designs of a number of aboriginal artists.¹⁶

Related to this is the unauthorized commercial use of the names of indigenous or tribal groups. For example, an automobile manufacturer has named one of its vehicles Cherokee. Also, the words Hopi and Zuni have been incorporated into trademarks without permission from the tribes concerned. Sometimes certain words applied to indigenous peoples,

which may be considered offensive, are used in the titles of professional sports clubs or as nicknames, for example, Chiefs, Braves, Indians, and Redskins. In some cases, use of these names in such contexts has been actively challenged by indigenous groups.

THE ROLE OF IP

It has become increasingly clear that IP issues are relevant to conservation, management, and benefit-sharing in respect of genetic resources, traditional knowledge, and folklore.

Genetic resources relate to intellectual property in several ways. First, IP issues arise when genetic resources have been modified by means of human intervention, thus acquiring characteristics that are not found in nature. When those modifications are new, involve an inventive step, and are capable of industrial application, they may be protected by patents. Similarly, genetic resources that exist in plant varieties that are new, distinct, sufficiently uniform, and stable may qualify for plant variety protection.

Second, as many types of biotechnological inventions draw from and build upon information about and characteristics of naturally-occurring plants, animals, and other living organisms, proposals have been made for the recording of interests in inventions that arise from access to or use of genetic resources and traditional knowledge. Such a requirement raises several issues for consideration by the IP community.

As for tradition-based innovations and creations generally, some fail to clear the hurdle set by current IP law, and are left stranded in the public domain where they may be freely copied and used by non-traditional persons and entities. Such groups may even, acting legally under current IP laws, acquire IPRs over works derived from traditional creations and innovations, without the obligation to acknowledge the source community or community members or share any commercial benefits with them. Thus, it is said by some that intellectual property may both positively and negatively exclude TK holders from enjoying the benefits of IP protection. These questions also raise several issues for consideration by the IP community.

In 1998, in order to explore these and related issues further, WIPO initiated a new set of activities “to identify and explore the IP needs and expectations of new beneficiaries, including the holders of indigenous knowledge and innovations, in order to promote the contribution of the IP system to their social, cultural, and economic development.”¹⁷ WIPO took an exploratory approach to these new activities by undertaking a number of fact-finding missions and organizing roundtable meetings.¹⁸

These activities enabled the Member States of WIPO to identify IP needs and expectations concerning access to and benefit-sharing in genetic resources and the protection of traditional knowledge and folklore. During these activities:

- Many persons consulted expressed interest in exploring further the actual and potential role of the IP system in TK protection. There are many examples of TK or TK-derivatives that are or could be protected by the existing IP system. Several informants also suggested certain changes to IP law to improve its functionality in this respect.
- Some participants also expressed the view that, in the short term at least, attention be focused on the extent to which existing IP tools can be used to protect TK. Testing the present categories of intellectual property would involve working directly with TK holders, including indigenous peoples and local communities, to raise awareness of the basics of the IP system, to undertake a practical and technical examination of the application of the IP system to various forms of traditional knowledge, and to provide relevant training. The idea would be to develop and experiment with existing IP tools to protect traditional knowledge in what was described as a “bottom-up” approach.

Holders of TK are interested in exploring greater use of almost all existing branches of the IP system, particularly trademarks, geographical indi-

cations, patents, industrial designs, copyright, and unfair competition, including trade secrets.

BOX-7.11 TRADITIONAL KNOWLEDGE DIGITAL LIBRARY

Recent efforts have been made to develop a TK classification and to create a Traditional Knowledge Digital Library (TKDL) with the goal of enhancing the quality of patent examination and allowing patent examiners access to pertinent information concerning prior art in the form of TK in an appropriately classified form. These issues were taken up at WIPO during 1998 and 1999.

An initiative was spearheaded by the Department of Indian Systems of Medicine & Homeopathy (ISMH). It set up an inter-disciplinary task force, known as the TKDL Task Force, drawing on experts from the Central Council of Research of Ayurveda and Siddha, Benares Hindu University, the National Informatics Centre, the Council of Scientific & Industrial Research and the Controller General of Patents and Trade Marks.

The Task Force evolved a Traditional Knowledge Resource Classification (TKRC), which would enable retrieval of certain information on traditional knowledge in a systematic manner.

The WIPO Member States have set up a Traditional Knowledge Task Force consisting of China, the European Union, Japan, India and the United States of America. The Indian proposal on creating a TKRC was presented to it.

Source: Dr. R. A. Mashelkar, Director General, Council for Scientific Research, India.

Certain countries are testing, using or studying specific IP tools, concepts, or options including:

- Protection under patent laws if inventions are derived from or based upon TK;
- The registration of collective and certification marks to establish a sign under which goods emanating from a particular group or collective, or manufactured in accordance with particular methods or standards, can be sold (see Box - 7.12);
- The prevention of unauthorized registration of traditional names, symbols, and insignia which are considered culturally offensive and therefore deemed to be contrary to public order or morality under trademark legislation;
- The inclusion in patent applications, which claim TK and biological resources-based inventions, of evidence that the TK or biological materials have been obtained with the prior informed consent of the country of origin, and the acknowledgment of all relevant public domain and community-based knowledge;
- The copyright protection of oral works;
- The protection of TK documentation by means of protection afforded to original and non-original databases.

In addition, there has been a broad call for the development, in the long term, of new IP tools to protect forms of traditional knowledge which are not covered by existing ones.¹⁹

BOX-7.12 REGISTRATION OF CERTIFICATION MARKS IN AUSTRALIA

The registration of collective and certification trademarks to protect tradition-based innovations and creations is under active exploration in Australia and New Zealand. An Indigenous Label of Authenticity was launched in Australia in late 1999. The label has been developed by the National Indigenous Arts Advocacy Association with the backing of the Aboriginal and Torres Strait Islander Commission (ATSIC) and the Australia Council for the Arts. The use of such marks as authentication marks is seen as effective to:

- Maintain the cultural integrity of Aboriginal and Torres Strait Islander art;
- Ensure a fair and equitable return to Aboriginal and Torres Strait Islander communities;
- Maximize consumers' certainty as to the authenticity of Aboriginal and Torres Strait Islander-derived products and services;
- Maximize the multiplicity and diversity of indigenous art;
- Promote an understanding both nationally and internationally of Aboriginal and Torres Strait Islander cultural heritage and art.

Source: Proposal made by the National Indigenous Arts Advocacy Association, quoted in Terri Janke, "Our Culture, Our Future" (Report prepared for the Australian Institute of Aboriginal and Torres Strait Islander Studies and the Aboriginal and Torres Strait Islander Commission, 1999): 78.

Holders of TK have also widely expressed their concerns as to their ability to use the IP system effectively owing to their unfamiliarity with such systems and the costs of acquiring, maintaining, and enforcing IP rights. Such operational questions are perhaps as important as the legal questions discussed above. This is also a strand of larger concerns with power – the financial and political power to use and take advantage of intellectual property, to influence the progressive development of IP law and policy, and to challenge IP claims made by others. The specific need to facilitate access to the IP system to enable TK holders to use it more effectively to enforce their rights is of great practical importance. These needs could be met, for example, by wider dissemination of IP information to indigenous and local communities to demystify intellectual property and resources to facilitate access to the national IP offices and the IP system.

CONCLUSIONS

Towards the end of 2000, the Member States of WIPO established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore.²⁰ This new forum, which met for the first time from April 30 to May 3, 2001, will enable further discussions between States on the three themes referred to in the title of the Committee.

At the first session of the Intergovernmental Committee, WIPO Member States expressed support for several tasks intended to advance discussion on the three themes.²¹ These were: the preparation of model intellectual property contractual clauses that can deal with access to genetic resources and benefit-sharing; in respect of traditional knowledge, the identification of those components of traditional knowledge that might be protected by intellectual property, and the compilation of empirical information on the extent to which the existing IP system is sufficient in addressing this form of knowledge; the preparation of information on the status of TK as prior art, and, the conducting of a survey among Member States on national experiences with the protection of expressions of folklore, particularly with the implementation of the 1982 WIPO/UNESCO Model Provisions for National Laws on the Protection of Expressions of Folklore Against Illicit Exploitation and Other Prejudicial Actions. The second and third sessions of the Intergovernmental Committee took place from December 10 to 14, 2001 and from June 13 to 21, 2002, respectively.²²

It is hoped that these discussions will continue to be open and informed and will lead eventually to a fuller understanding of the mutual relationships between intellectual property and access to and benefit-sharing in genetic resources and the protection of traditional knowledge and folklore. Greater appreciation of the role of intellectual property in these areas will serve to ensure that IP law and policy continue to play a developmental role to support communities from all countries to protect, conserve, sustain and, above all, benefit economically from genetic resources, traditional knowledge, and folklore.

- 1 WIPO "Intellectual Property Needs and Expectations of Traditional Knowledge Holders, WIPO Report on Fact-finding Missions on Intellectual Property and Traditional Knowledge" (WIPO: Geneva,2001): 25.
- 2 WHO/IUCN/WWF, **Guidelines for the Conservation of Medicinal Plants** (Gland, 1993).
- 3 V. A. Hafeel and Darshan Shankar, "Revitalising Indigenous Health Practices," **Compas Newsletter for Endogenous Development**, No.1 (February 1999) (quoted in UNCTAD, "Systems and National Experiences for Protecting Traditional, Innovations and Practices," UNCTAD Expert Meeting on Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices; Geneva, October 30-November 1, 2000).
- 4 Graham Dutfield, "The Public and Private Domains: Intellectual Property Rights in Traditional Knowledge," **Science Communication** 1, No. 3 (2000) 276-277.
- 5 UNCTAD, "Systems and National Experiences for Protecting Traditional, Innovations and Practices."
- 6 Douglas Nakashima, "Conceptualizing Nature: The Cultural Context of Resource Management," **Nature & Resources** 34, No. 2 (1998): 18.
- 7 This section draws upon materials written for WIPO by Graham Dutfield and Henrietta Marrie on Intellectual Property and Traditional Knowledge (as yet unpublished).
- 8 President's Committee of Advisers on Science and Technology (PCAST), Panel on Biodiversity and Ecosystems, **Teaming with Life: Investing in Science to Understand and Use America's Living Capital** (Washington, D.C.: PCAST, 1998): 5.
- 9 Principe, 1989. This estimate assumes that 25 percent of the total sales value of drugs sold in OECD countries as a whole was constituted by products containing at least one plant-derived ingredient.
- 10 **International Herald Tribune**, May 28, 2001.
- 11 This section draws upon Graham Dutfield and Henrietta Marrie, *op. cit.*

- 12 Sherylle Mills, "Indigenous Music and the Law: An Analysis of National and International Legislation," *Yearbook for Traditional Knowledge Music*, 1996: 57.
- 13 *Idem.*
- 14 UNCTAD, *op. cit.*
- 15 Source: ten Kate and Laird, *The Commercial Use of Biodiversity*, (Earthscan Publications, 1999) 2.
- 16 **Milpururru v. Indofurn (Pty) Ltd.** (1995) 30 IPR 209.
- 17 WIPO, *Program and Budget 1998-1999*: 11.1.
- 18 See WIPO, "Intellectual Property Needs and Expectations of Traditional Knowledge Holders – WIPO Report on Fact-finding Missions on Intellectual Property and Traditional Knowledge". For further details, see www.wipo.int/globalissues/index-en.html
- 19 Numerous stakeholders have stressed the need for an international framework for traditional knowledge protection. A multilateral framework, under which traditional knowledge can be protected in all signatory countries in the same way as any other intellectual property, deserves consideration. However, possible legal and operational solutions first need to be developed and tested nationally and regionally. The WIPO/UNESCO Model Provisions for National Laws on the Protection of Expressions of Folklore Against Illicit Exploitation and Other Prejudicial Actions of 1982 may provide a possible foundation for future work in this respect.
- 20 WIPO General Assembly (September 25-October 3, 2000).
- 21 See WIPO/GRTKF/IC/1/13.
- 22 See <http://www.wipo.int/globalissues/igc/documents/index.html>

CHAPTER 8

ACQUISITION AND MAINTENANCE OF INTELLECTUAL PROPERTY RIGHTS

The first component of the IP system is the legislative framework that defines and clarifies rights and procedures. This component starts with international treaties and conventions and flows outward to the national level, where there are national laws, rules, and regulations. The second component comprises the institutions and facilities through which rights and interests are actualized; this includes the acquisition and maintenance of IPRs through IP national and regional offices, as well as the enforcement of IPRs by institutions, such as the courts, customs, and police.

The national IP office (IPO) is part of this second component and is in charge of administering the system of IPR acquisitions.¹ The type of administrative system for IP protection that should be established and made available to the public is a key economic policy question. The costs associated with the second component consist of administrative costs for the acquisition and maintenance of rights, and of administrative and judicial costs for enforcing IPRs against infringement. This chapter will examine the systemic aspects of IPRs and evaluate economic aspects of the acquisition and maintenance of rights. The enforcement dimension of the IP system will be discussed in Chapter 9.

The economic and social cost of establishing and maintaining an IPO has recently come under special attention, as users of the IP system have requested a reduction in the fees for filing an application, and obtaining and maintaining IPRs. Users have become aware of the cost, as many wish to expand their IPR protection to other countries in response to the globalization of markets and trade, as well as the advent of e-commerce. However, cost reduction is difficult for many IPOs that have an increasing workload with limited resources. This chapter will also enumerate factors to be considered for possible solutions to the emerging problems facing IPOs.

ORGANIZATION AND STRUCTURE OF INTELLECTUAL PROPERTY OFFICES

The organization and structure of IPOs varies significantly, and almost every country is an example unto itself.² The different offices may also vary as to other tasks performed: some offices may be requested to keep the business registry (as in France);³ some may deal with issues relating to the defense of competition (as in Peru);⁴ some may have responsibility for the entire IP system (as in Indonesia), or may be limited to administering patents.

A trend is emerging towards some measure of institutional and financial independence for IPOs within the state. This trend is supported by the fact that IP offices receive direct payment for their products and services and are viable to act as independent, self-financing bodies or agencies. This is the case in a number of countries, including Japan, Mexico, Peru, Switzerland, the United Kingdom, and the United States of America. However, even with financially self-supporting arrangements, these offices still have governmental policy coordination.

There are a number of advantages associated with the concept of independent IPOs. From a political point of view, it can be seen as a reflection of a policy priority of the government. Financial independence can allow the office to develop a more comprehensive, flexible and focused approach to the various issues that it faces. It also enables IPOs to use revenues obtained from patent, trademark, and other applications to invest in improving the quality of services offered, including outreach activities, e-filing, examination reports, and IP databases. It can provide good motivation for an IPO to continually improve customer service and also to promote IP asset development. There is a built-in incentive to encourage the development of patent portfolios so IPOs may be more motivated to promote SME activities and generally to make the system more user-friendly. The IPOs would have more incentive to respond faster and more comprehensively to the needs and demands of the business community and, as a result of successful efforts in this regard, to reduce their fees as the system becomes more efficient. The IPO would respond with agility to policy and practical challenges. For example, it may be able to reduce fees or create a sliding scale for fees based

on the income of the filing entity without having to obtain legislative or administrative approval that might subject such action to delay. Such advantages in terms of flexibility and agility must be weighed against the need for IPOs to function in coordination with national IP policy and goals. Each country will have to consider the issues and adjust for the proper mix of financial independence and policy coordination.

NEW CHALLENGES

As illustrated in Chart - 8.1, in an era of rapid technological change and short product cycles, IPOs are increasingly under pressure to speed up their procedures for granting patents and registering marks. In the fields of information and communication technologies, in particular, where innovations are taking place at a startling pace, lengthy and time-consuming procedures for granting patents pose the risk of undermining the potential of the IP system for promoting technological innovation and creativity.

It is crucial that, while maintaining its efficiency and thoroughness, the IP system must also become as expeditious and responsive as possible, to enhance its role in the promotion of innovative work, and to enable the business community to make more and better use of it. Many patent offices are making considerable progress by setting targets for achieving more expeditious granting, strengthening their staff, computerizing application and examination procedures, and enhancing international cooperation.⁵

CHART-8.1 GROWING DEMANDS ON INTELLECTUAL PROPERTY OFFICES

Need for Speed

Growing need for expeditious decision-making, as technical changes and product life cycle speed up

High Quality of Decisions

Consistency of decisions with internationally harmonized standards

IP OFFICE

More Filings

An increasing number of applications

Need for Expertise

More complex inventions to examine and more information to search

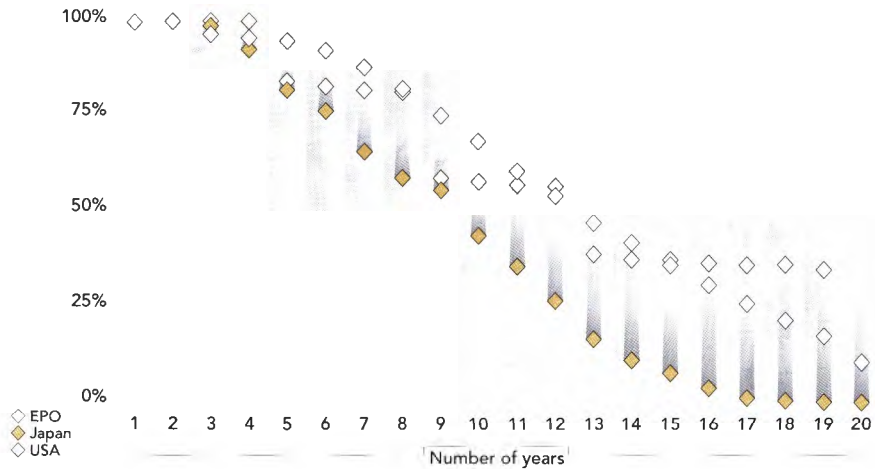
PATENTS

ANALYSIS OF COST TO BE PAID BY APPLICANTS

FEES

Filing an application for patent protection and obtaining and maintaining a patent is an expensive undertaking. It may cost from US\$10,000 up to US\$100,000 (spread over the life of the patent) to seek and maintain protection for even one invention in a few large patent markets. These figures can be higher if patents are sought in many countries. Apart from the preparation of an application in the original language, the cost of translation of the application into other languages, the payment of maintenance fees for many years, and the cost of attorneys in different countries may account for the major part of the total cost. Fees payable to IPOs generally include an initial application fee, a fee for conducting the search and examination, a grant fee, and an annual maintenance fee. Generally speaking, to maintain a patent throughout the maximum period of the patent term is expensive, particularly in certain countries which adopt a system requesting the patent holder to pay higher maintenance fees towards the end of the patent term. It reflects a policy balance between the patent holder's commercial interest and the public interest in making more "dormant patents" available in the public domain for free use. This policy appears to achieve the expected goal in many countries (see Chart - 8.2).

CHART-8.2 MAINTENANCE OF GRANTED PATENTS BY TRILATERAL OFFICES



Source: Trilateral website, <http://www.jpo-miti.go.jp/saikine/tws/tsr99/graph433.htm>.

TRANSLATION COST

Another category of patent cost relates to the translation of patent applications. This is the case for the European Patent Office (EPO), where an attempt to reduce translation requirements (currently estimated at 25 percent of total patent cost) through the introduction of the Community Patent has been the cause of much debate. For example, on July 5, 2000, the European Commission proposed the creation of a Community Patent to give inventors the option of obtaining a single patent legally valid throughout the European Union. One of the principal aims of the proposal is to “reduce the cost of patenting an invention in Europe” in particular through the reduction of translation requirements.⁶ Translation cost also plays an important role for patent applications in foreign countries; this issue will be discussed again in this chapter under the section on the Patent Cooperation Treaty (PCT).

A brief glance at the total cost of patents in the three largest patent offices (see Table - 8.3) indicates one reason why individuals and SMEs sometimes consider that the cost associated with obtaining a patent is too high. This issue has been raised in different international fora, including the Industry Advisory Commission (IAC) of WIPO in May 2000, when the IAC urged "Member states of WIPO to adopt a work program for the development of a more comprehensive approach to the reduction of the cost of obtaining and maintaining intellectual property protection in multiple countries."⁷

To introduce a system allowing any applicant to file an application for free (as in the United Kingdom) is one solution. Another is a system of preferential fees for small entities in a number of countries, for example, in Canada, the Philippines and the United States of America, and lower fees for applicants from certain countries as in the PCT system. They are initiatives which are also helping to balance inequalities in the system by creating a more level playing field.⁸ There is no reason why IPOs cannot charge non-profit bodies, such as universities and public research centers, lower fees. This effectively lowers the barrier to entry into the patent system.

ATTORNEY FEES

Applicants also pay the cost related to employing the services of a patent attorney. The patent attorney has become necessary because of the complexity of patent documents; differences in various patent laws; and the need to combine adequate technical expertise with legal expertise, thus helping to ensure that the patent application will move through the system successfully. Patent attorney fees may vary significantly, but they represent a substantial cost that increases the financial burden of securing patent protection. In the EPC countries, Japan and the United States of America, patent agent fees are considered, on average, to represent 34 percent, 51 percent, and 55 percent, respectively, of the total cost of patent protection (see Table - 8.3).

TABLE-8.3 COMPARISON OF COST AND FEES (IN US\$) PAYABLE FOR OBTAINING PATENTS IN EPC COUNTRIES, THE UNITED STATES OF AMERICA AND JAPAN

	Filing and search fees	Examination fees	Grant fees	Renewal fees	Translation cost	Attorney fees	Total
EPC*	758 + 498	1340	669	15,725	11,800	15,920	46,810
United States	645	n/a	1,135	2,560	n/a	5,340	9,680
Japan	197	1,030	797	5,475	n/a	7,920	15,419

* European Patent Convention. Figures relate to a "typical" European Patent covering eight member states.

Source: *European Commission, Commission Proposes the Creation of a Community Patent, July 2000.*

COST ASSOCIATED WITH INTELLECTUAL PROPERTY OFFICE OPERATION

OVERVIEW

Fees paid by applicants become sources of income for the operation of an IPO. Simplifying and rationalizing the patent system and reducing the operational cost of the office will enable fees to be reduced and make the patent system more attractive. The administrative costs for the operation of such offices can be grouped as shown in Table - 8.4.

TABLE-8.4 PATENTS FROM FILING TO GRANT AND COST IMPLICATIONS

Events in chronological order	Cost implications		Proposed Solution
	Applicants	Intellectual Property Office	
(a) Processing, formal examination	Work for correction of errors	Resources for formal examination	E-filing* (data verification and conformity check), PCT, harmonized procedures (PLT**)
(b) Search of relevant technologies (prior art search)	Search work to meet the disclosure requirement	Search databases, examiner's search work	PCT search report, patent search databases regionally or internationally maintained
(c) Substantive examination	Attorney's fees	Examiner's work	Regional and/or international cooperation of examiners, recognition of the result
(d) Publication of patents	n/a	Printing and delivery of patents in paper	Internet publication

*Electronic filing **Patent Law Treaty

OFFICE AUTOMATION

The automation of procedures for patent application, search, and examination is helping to reduce costs. The experience of the JPO, which has operated in a paperless environment with on-line filing for the last ten years, suggests that electronic processing of applications has reduced costs related to tasks referred to in (a), (c), and (d). Organizing, storing, and retrieving information electronically can save time and money and can allow the system to become more cost-effective (see Box - 8.5). However, few IPOs have the means to institute automated filing mechanisms as yet, and automation requires a significant initial investment.

MARKET DEMANDS

The beginning of the life of a patent starts with the filing of an application for patent protection with the national or regional patent office. The demand for patent rights (as seen from the perspective of the number of applications filed) increased significantly in the second half of the 1990s (for example, from 1994 to 1998, from 2,306,840 to 5,806,570, an increase of 152 percent⁹). The TRIPS Agreement has confirmed the priority rule of the Paris Convention; users seeking patent protection in many countries claim priority on the basis of the original application. As most patent offices require applicants to file an application in paper form, the PCT is used to ease the applicant's burden of preparing multiple copies of the same application to be filed with different patent offices. The Patent Law Treaty (PLT) and the on-going efforts to introduce an e-filing system, are expected to further reduce the cost of filing an application.

FORMAL EXAMINATION

Broadly speaking, one can distinguish between two kinds of examination: formal examination and substantive examination. In a formal examination, the IPO verifies whether the application fulfills all the requirements prescribed by law, such as whether the patent was drafted in the appropriate format, and whether the necessary fees have been paid. Certain applications may be sent back to the applicant for correction or simply dropped if the application is not in a patentable field.¹⁰ Recent e-filing software allows applicants to verify the required elements and formality compliance, which is expected to reduce the cost associated with this process. The acceptance of e-filing will bring economic benefits both to applicants and to those IPOs that can rely on a computer-assisted formality check.

SEARCH AND SUBSTANTIVE EXAMINATION

In a substantive examination, applications are examined in detail as to their content. In order to judge whether an invention is new and therefore patentable, the prior art search must be comprehensive and thorough. Ideally, a patent examiner would compare the claimed invention with all the existing literature concerning the relevant technical field, in all languages, and in doing so, reach a conclusion on the patentability of the claimed

invention. In practice, however, no patent office could possibly afford to collect, arrange, store, and process all information and material. Considering that the patent literature alone amounts to approximately 50,000,000 items, and grows by about 1,000,000 new items each year, and further, that other scientific literature also grows at a similar rate, it is obvious that such an all-inclusive process would be impracticable. Even the largest patent offices, whose staff well exceeds 1,000 persons, must limit themselves to the information available in a few languages emanating from selected publications.¹¹

The maintenance of the most up-to-date search databases is among the most expensive operations of the IPO. Though accurate estimates are not available, the programs and budgets of the EPO, JPO, and USPTO (Trilateral Offices) indicate that most of their IT investment (between 20 percent and 30 percent of the total budget) has been made to enhance searchable databases. Indeed, to exchange patent data to complete their databases was the reason that the heads of the Trilateral Offices started the Trilateral Cooperation in the early 1980s. The required size of the searchable documentation, and the need for technically qualified examiners, make the cost of maintaining a meaningful substantive examination system enormous.

At the end of 1998, there were approximately 4 million patents in force. Once an application is accepted, the likelihood of a patent being granted will depend largely on the examination procedure used by each patent office. In the EPO, for example, 64 percent of patent applications are eventually granted. Figures for the JPO and USPTO are 64 percent and 71 percent respectively. As will be discussed below, this figure may be significantly higher in countries that do not conduct substantive examinations.¹²

The present burden sharing between applicants (disclosure by the applicant of technologies previously known to the applicant) and the IPO was fixed many decades ago when only the IPO had a comprehensive collection of technological documents. In the Internet age, when vast amounts of information are made accessible to the public, searchable with sophisticated search engines, the time seems ripe to consider whether and how IPOs could receive more assistance from applicants and stakeholders or potential competitors in the search for relevant technological information.

STAFFING

Patent applications cover such diverse fields as combustion engines, biotechnology inventions, sports equipment, electronic devices, and musical instruments, to name only a few. There are in fact 70,000 technology categories (or groups) in the International Patent Classification covering all possible fields of invention.¹³ Substantive examination requires highly qualified examiners who are well-acquainted with the latest technological advances in their specialized field of competence. Notwithstanding this need, a large staff means a considerable expenditure for human resources.

Table - 8.5 shows the expenses involved in managing selected IPOs. Reflecting various factors such as policy priority, economic strength and the existing regional cooperation, some countries with a smaller total population spend a higher proportion of their GNP and public sector budgets on obtaining an equivalent level of examination.

TABLE-8.5 STAFF AND BUDGET OF SELECTED PATENT OFFICES

Country Patent Office	Staff numbers		A - Patent applications (incl.PCT designations)	B - IP Office Annual Budget (in mill. US\$)	C - Country Population (in mill.)	D - IP Office Budget per capita (in US\$)
	Examiners	Total staff				
USPTO	3,000	4,700	262,787	863	275	3.13
EPO (20 States)	2,400	4,400	121,750	513	420	1.22
Japan	1,100	2,500	437,375	844	127	6.64
Russian Fed.	900	2,700	58,532	14.3	145	0.1
R O Korea	382	1,002	121,750	120	47	2.55
China	800	1,500	114,830	-	1280	-
Brazil	150	610	50,866	42	170	0.24
Sweden	300	1,000	149,493	69	9	7.6
Australia	196	830	57,706	42	19	2.2
Canada	125	-	65,682	42.1	31	1.35
Spain	130	600	147,889	45.3	39.5	1.13
Mexico	60	611	44,721	25.5	99	0.25
Egypt	25	146	1,682	1	66	0.015
Morocco	3	60		1	28	0.036
Singapore	0	85	44,948	4.9	4	1.2

NOTE: The number of examiners may include those who undertake formality examination. If the IPO covers not only patents but also other industrial property rights such as registration of trademarks and designs, figures of the total staff and budget for all those services are indicated.

Source: IMF, World Bank, Trilateral website (www.european-patent-office.org/tws/twsindex.htm) and annual reports of patent offices. Figures are calculated using the exchange rate as of September 2001.

TO BE OR NOT TO BE

The debate on substantive examination versus simple registration remains open, and at the same time, some alternative solutions are emerging (see Box - 8.6). Countries that conduct them are reluctant to abandon substantive examination, because in their view, substantive examination of patents remains important to determine whether patents fulfill the patentability requirements.

On the other hand, a considerable number of countries have opted for an alternative examination system. Some patent offices have established what is referred to as a registration system with a prior art search. Under this system, the patent office conducts the prior art search and prepares a search report, which is made available to the applicant and to the public. In some cases, small patent offices with a limited number of examiners entrust the prior art searches to some of the larger patent offices better equipped for substantive examination, in exchange for a payment (for example, Singapore entrusts this task to IP Australia¹⁴). Another option is to conduct only the formal examination and dispense with examination to determine prior art. Looking at the total balance sheet of society as a whole, with the simple registration system some cost is transferred to the judicial system, such as the validity of the patent, which will be decided, if contested, by the courts in a procedure between the owner of the patent and any person who wishes to contest the patent. From the point of view of the patent office, such a system leads to considerable savings in terms of staff expenditure, and in general, more efficiency. It is also true, however, that patent holders will be less sure of the strength of the patent, as there is a higher probability that it could be contested at a later stage. The simple registration system may be ill-suited to a country where stark competition on technological developments exists, as applicants and their competitors have to compensate for the lack of certainty of patents in a court room and the industry suffers from unfair competition based on weak patents. The abbreviated procedure also gives an advantage to parties who have the resources to diligently file applications regardless of the merit of the putative invention, on the assumption that the cost of challenging an issued patent will discourage such challenges. Again, the result of such a procedure may be a lessening of the inventive purpose of the patent system by tolerating the issuance of weak patents.

BOX-8.6 INNOVATIVE ALTERNATIVES TO SUBSTANTIVE EXAMINATION: THE SLOVENIAN CASE

The Republic of Slovenia declared its independence from the former Socialist Federal Republic of Yugoslavia in June 1991. The government attached high priority to the establishment of an effective system of protection of intellectual property. The Intellectual Property Office was formally established by a constitutional law which accompanied the adoption of the Declaration of Independence of Slovenia. In 1992, the new Slovene "Law on Industrial Property" was adopted with an innovative solution to the problem of effective patent protection without domestic substantive examination. The new law made use of search and examination results made available by other IPOs that are the PCT International Searching Authorities and International Preliminary Examining Authorities. Reports from those authorities are considered sufficient proof of patentability and result in automatic confirmation of the patent for its full 20-year period.

In July 1993, a year after the introduction of the Law on Industrial Property, Slovenia signed the first Extension Agreement with the EPO (extending the validity of patents granted by the EPO to Slovenia), an event which marked the beginning of a new era in the expansion of the European Patent System to many other Central European and Baltic states.

Source: Bojan Pretnar, *Protection of Inventions in Slovenia IIC.24, No.1 (1993)*.

ALTERNATIVES – USE AND/OR RECOGNITION OF EXAMINATION RESULTS

Singapore and Malaysia grant a patent if the applicant modifies the claims in his application to make them the same as those granted by the other IPOs designated by these countries (also known as the modified search and examination system). The system can do away with search and substantive examination work by trusting the result of certain offices.

It is clear that cooperation among examining patent offices could serve to greatly decrease the financial burden associated with substantive examinations, particularly in cases where the same application is being examined in many countries. With the exception of the countries or regions with the largest economies, the great majority of the total number of applications received by patent offices are from foreign nationals. The statistics on this point are quite striking and show that up to 99 percent of applications in certain countries are filed by foreign applicants.¹⁵ In fact, in many cases, the application would have been filed in a number of countries. In such cases, examination reports on the patentability of the application would have been available for use by other offices. This is the basic architectural idea of the PCT. Patent offices should be able to greatly benefit from the examination reports prepared by other offices.

“There is, for example, an application pending in the United States for a patent on a DNA sequence. This is a single patent, but it is expected that it will cost the [Japanese] patent office about US\$9,100 to ascertain whether or not the same basic application has already been filed, or the information is already commonly known. It would be very wasteful to have to duplicate this effort in Japan and Europe. If one patent office has conducted a prior-art search, it would make sense for the other jurisdictions to recognize those search results. An ordinary filing in Japan currently costs US\$191 and it is impossible for JPO to hope to break even if it has to spend about US\$9,100 just for ascertaining patentability.”¹⁶

So far, there has been no encouraging sign of movement towards a first multilateral agreement based on mutual recognition of examination results. The largest offices seem to have the highest hurdles to clear, including harmonization of patent laws and examination standards, fair distribution of work, communications between examiners despite difference in working languages, and full support from national and regional users.

REGIONAL SYSTEMS

Because of the effects of globalization, technological advancements, and the convergence of both technologies and enterprises, there is a clearly perceived need for enhanced regional cooperation through harmonization of IP legislation and of coordinated and/or more efficient practices with respect to the administration of IPRs. Those solutions encompass sharing of resources, leveraging of costs, the possible creation of common IPOs and courts, sharing of examination databases, recognition of patent examination within regional organizations, and even supranational IPRs. Currently, regional agreements include the Subregional Integration Agreement of the Andean Community Countries, the Central American Convention for the Protection of Industrial Property, and Chapter 17 of the North American Free-Trade Agreement.¹⁷ Regional cooperation between certain countries has led to the establishment of regional IPOs that have considerably facilitated the acquisition of patents, as well as enhanced efficiencies in human resources and finances for individual countries. The regional offices that are currently in operation are shown in Table - 8.7.

TABLE-8.7 REGIONAL INTELLECTUAL PROPERTY OFFICES

Intellectual Property Office	Since	Members	Headquarters	Types of Intellectual Property
African Intellectual Property Organization ¹⁸	1962	15 countries of French-speaking Africa	Yaounde, Cameroon	industrial property
African Regional Industrial Property Organization ¹⁹	1976	14 countries of English-speaking Africa	Harare, Zimbabwe	industrial property
European Patent Office ²⁰	1977	20 European countries	The Hague, Netherlands; Munich and Berlin, Germany	patents
Eurasian Patent Office ²¹	1994	11 Commonwealth of Independent States countries	Moscow, Russian Federation	patents
Patent Office of the Gulf Cooperation Council	1999	6 Gulf countries	Riyadh, Saudi Arabia	patents

Regional patent systems could be explored not only because of efficiency and leveraging of costs, but also because of the potential for synergy in regional markets for products and IP licensing. Regional IP systems could give a boost to developing country efforts to utilize IP as a tool for economic development.

GLOBAL SOLUTION

One may question whether regional cooperation or multilateral cooperation among several countries could be extended in the foreseeable future to cover over 170 countries in the world to catch up with the pace of current global economic activity. The establishment of an international patent system was already considered a long-term solution when WIPO Member States adopted the PCT at the Diplomatic Conference held in Washington, D.C., in June 1970. Today, countries have more reasons than ever to explore this ambitious project. As information-sharing is increasingly facilitated by advances in the field of IT and telecommunications, the digital revolution is enabling countries to enhance cooperation and share data and information in a rapid, paperless, and inexpensive manner.

Currently, the PCT is subject to ever-growing worldwide demands. The economic benefits of the PCT system have been proved by the dramatic rise in the number of applications received, particularly in the 1990s when economic and IP activities became truly international (as of August 2002, 117 countries were party to the PCT). Is it then worth reviewing and developing the present PCT system in pursuit of a complete international patent system that could provide an ultimate solution?

The PCT has taken an immense load off national patent offices as formal examinations are conducted only once – by the receiving office. The PCT is also designed to enable IPOs to rely on prior art searches and substantive examinations (under the PCT, they are called international searches and international preliminary examinations, respectively) that have been conducted only once by one of the officially recognized patent offices which serve as a PCT authority (IPOs of Australia, Austria, China, Japan, the Republic of Korea, the Russian Federation, Spain, Sweden, the United States of America, and the EPO).²⁴ The PCT system allows applicants to delay the final decision to request national and

regional patents for many months, while the international search and, if desired, international preliminary examination take place. This could be crucial for entrepreneurs who are initially exploring the possibilities of commercializing the product; after having figured out the marketing possibility, they can save the translation cost, and various fees, by not proceeding with certain PCT applications in countries with lower business potential. The PCT also simplifies the entire procedure for applying for patents abroad, making the system more uniform, centralized, and less cumbersome.

However, the PCT also has a structural limitation to its legal effect. Under the PCT, responsibility for granting patents remains with the national and regional patent offices, which will ultimately decide on the patentability of the invention. International preliminary examination reports are authoritative reports but are not binding, and the national or regional office often conducts a complementary search or further examination to ascertain the result of the preliminary examination. The possibility of further reducing the cost of taking the final decision under the PCT depends on whether and to what extent its Member States wish to trust the result of work done by PCT authorities.

In October 2001, WIPO launched worldwide consultations on the development of a strategic blueprint for the future evolution of the international patent system.²³ The initiative, known as the "WIPO Patent Agenda", is intended to find solutions to problems, both from the long-term to the more immediate, most notably the crisis facing a number of patent offices in managing excessive workloads. The project will complement and strengthen on-going projects such as PCT reform and the harmonization of substantive patent law. A Conference on the International Patent System was convened by WIPO in Geneva from March 25 to 27, 2002, in order to discuss the WIPO Patent Agenda.²⁴ It was organized to discuss the main issues and challenges confronting the international patent system and to receive further input and responses from users of the system. Matters raised in discussions during the Conference are being taken into account in input prepared by the Secretariat, for presentation to the WIPO General Assembly.

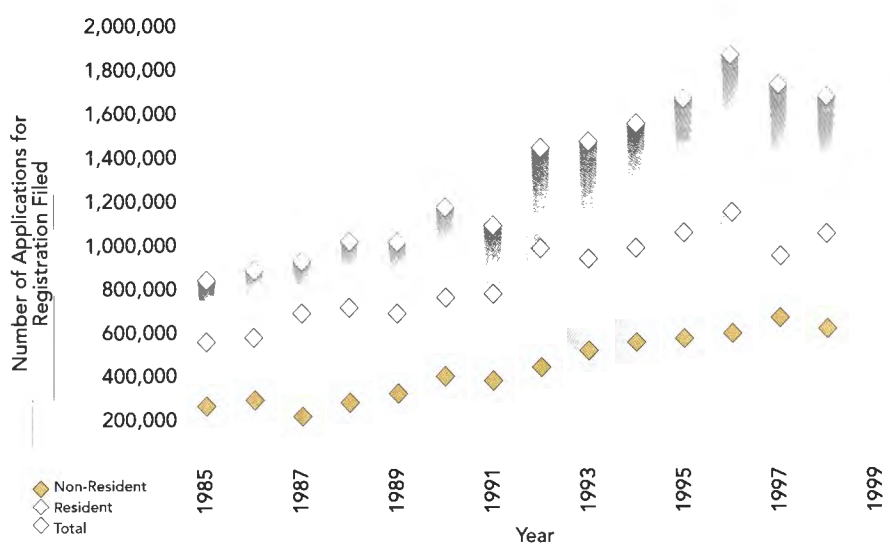
TRADEMARKS

FROM NATIONAL TO GLOBAL

Statistics for marks, in contrast to those for patent applications, show that national resident applications for use in domestic markets still represent the majority of overall global applications. Different marks for the same product are often used and registered in different countries according to a firm's market segmentation and customization strategy. However, most multinational corporations prefer the same mark for the same product and services on a global basis, to establish a strong worldwide brand. The principle of the Paris Convention is the territoriality of a mark, that is, the protection of a mark depends on each national or regional trademark system.

The function and purpose of marks has also been enhanced in the midst of unprecedented technological advancement and expanding economic development. As is the case with patents, the use and registration of marks has increased over the past decade or so. Market integration and globalization have caused more extensive use of marks across borders, and enterprises are increasingly inclined to register their marks in foreign markets (note the nonresident applications in Chart - 8.8).

CHART-8.8 TOTAL TRADEMARK APPLICATIONS WORLDWIDE



Source: WIPO

ANALYSIS OF COSTS TO BE PAID BY APPLICANTS

Because of the less stringent examination procedures as explained below, the costs of obtaining a mark are low when compared to the costs associated with acquiring patents. Table - 8.9 lists the fees associated with registering and renewing marks in various countries around the world.

TABLE-8.9 TRADEMARK FEES IN SELECTED COUNTRIES IN US\$

Country /Region	Fees for Receiving and Examining an Application for Registration	Fees for a Certificate of Registration	Fees for Renewal
Algeria	** 68.62	13.72	96.00
Argentina	100.20	-	100.20
Canada	** 99.70	132.95	199.40
Italy	** 71.80	-	47.80
Japan	179.90	-	1,293.00
Rep. of Korea	** 50.75	164.75	199.80
Mexico	124.15	-	144.80
OHIM*	903.80	1,019.70	2,317.00
Singapore	175.25	-	143.20
UK	292.90	-	292.90
US	325.00	-	400.00

* Office for Harmonization in the Internal Market (Trademarks and Designs) of the European Union²⁵

**Data refers to a single trademark in a single class. Local fees as of January 2001. Conversion rates to US\$ as of January 2001.

TRADEMARK OFFICE OPERATION

Though a mark can be protected on the basis of either use or registration, reflecting the historical development of various trademark systems, nearly all countries today provide for a trademark register, and full trademark protection is properly secured only through valid registration. Because of territoriality, the main function of a national or regional trademark office is the establishment and maintenance of the trademark register.²⁶ An application for registration of a mark must be filed with the appropriate national or regional trademark office. Usually the office in charge of marks also administers patents.

The requirements for registration are normally completed in two stages. Firstly, there will be a formal objective examination in order to confirm that the application has been duly completed and that it contains all the necessary information. The examination will then progress to the more subjective phase, which will focus upon examination of the substantive element of the proposed mark. The criteria of protectability (the requirements that a mark must fulfill in order to achieve the status of a registered mark) are reasonably standardized throughout the world. In addition to internationally harmonized requirements such as the public interest, the office considers whether the mark applied for is identical or similar to marks that have been applied for or registered in the register for identical or similar goods or services. This examination of similarity between marks is limited to marks valid in that country or region and thus less complex and time-consuming than a patent examination.

TABLE 8.10 MARKS FROM FILING TO REGISTRATION AND COST IMPLICATIONS

Events in Chronological Order	Cost implications		Proposed Solution
	Applicants	Intellectual Property Office	
(a) Processing, formal examination	Attorney's fees, conformity with regulations	Resources for formal examination	E-Filing (data verification and conformity check), the Madrid System, harmonized procedures (Trademark Law Treaty)
(b) Search and substantive examination	n/a	Search databases, examiner's search work	An electronic trademark register
(c) Registration and issuing of certificates	Attorney's fees	Printing and delivery of the <i>Trademark Gazette</i> in paper	International cooperation of examiners, recognition of the result
(d) Renewal	Payment of fees	Updating of the register	Internet publication (IPDL)

Upon successful fulfillment of the requirements necessary to obtain a Certificate of Registration, the rights arising from the protection granted to the mark are valid for an initial term of protection, which is generally ten years in the country or region in which the certificate was issued. Marks are renewable for prescribed periods of time, generally the same as the initial period of protection. Payment of a renewal fee, evidence of active usage, and a renewal application are generally required to legally complete the renewal process.²⁷ The process is considerably cheaper and less demanding on staff than in the case of patents.

INTERNATIONAL SYSTEM

In an effort to facilitate the development of global and international business, which is based to a large extent on marks and enhanced consumer brand recognition, systems for the international protection of marks have been established. For example, certain countries promoting economic integration and free flow of goods and services among themselves have adopted regional trademark systems, such as those managed by the Benelux Trademark Office and the Office for Harmonization in the Internal Market (Trademark and Designs) (OHIM) – the European Community trademark office. Those systems provide, as one of their main benefits and objectives, a single, universal application. Or stated conversely, these international systems seek to reduce the heavy burden of filing separate trademark registrations (and renewals) in all countries of the world where the applicant wishes to conduct business using the subject mark.

In addition, to attenuate the rigorous requirements of making separate trademark registrations with each national or regional office in which the applicant wishes to do business, the Member States of WIPO adopted the Trademark Law Treaty (TLT) in 1994. The TLT is aimed at simplification of trademark registration procedures. Other systems which exist are the African Intellectual Property Organization (OAPI) and the African Regional Industrial Property Organization (ARIPO). These are centralised registration systems which implement common procedures and uniform systems of legislation in their member states and which are designed to promote and develop harmonised frameworks of protection in the states which are party to those treaties.

Two international treaties to establish an international registration system for marks have been concluded by WIPO, namely, the Madrid Agreement Concerning the International Registration of Marks (1891), and the Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks (1989) (together referred to as the Madrid system). The Madrid system of international registration of marks may be used by individuals and companies established in, or residents or nationals of, countries which are party to the Madrid system (70 contracting parties as of February 2002).

The process starts by either applying for registration, or registering, the mark in the national trademark registry. This is a *sine qua non* for registration under the Madrid system, as applications cannot be sent directly by the

applicant to WIPO, but must be processed by the national trademark office. Once this initial step has taken place, WIPO registers the mark in the International Register and informs all those countries in which trademark protection has been requested, of the registration. Each designated country has the right to refuse protection (either partially or fully), through its trademark office, on the grounds that prior rights exist or that the mark conflicts with any of its national requirements. Unless refusal is notified within a given time limit (12 to 18 months), trademark protection is automatically granted. Trademark protection granted via the Madrid system is equivalent to that of any other mark registered directly at the national offices. The initial term of protection for an international registration is for a period of ten years. It may be renewed for further periods of ten years each, on payment of the prescribed fees.

ADVANTAGES OF THE MADRID SYSTEM

International registration has several advantages for the owner of a mark. After registering the mark or filing an application for registration with the IPO of the country of origin, the owner will only need to file one application, in one language, and pay one fee, instead of filing separately in the trademark offices of the various countries, in different languages, and paying separate fees for each.

A further important advantage is that changes subsequent to the registration, such as a change in the name or address of the holder, or a change (total or partial) in ownership or a limitation of the list of goods and services applicable, may be completed through a single procedural step and the payment of a single fee. Moreover, there is only one expiration date and only one registration to renew.

International registration under the Madrid system is also advantageous for IPOs. They do not need to further examine the international applications for compliance with formal requirements, or to classify the goods or services, as these tasks will have already been carried out by the International Bureau of WIPO, which will also, in due course, publish the marks. Furthermore, the offices are compensated for the work that they perform under the Madrid system; a proportion of the overall fees collected by the International Bureau, are allocated and paid back to the con-

tracting parties with respect to the trademark applications in which they have been designated (see Table - 8.11). These fees are distributed annually among the contracting parties.³⁰ For the year 2001, the International Bureau distributed a total of CHF 72 million resulting from the collection of fees. In addition, if the Madrid Union closes its biennial accounts with a profit, the proceeds are divided among and paid to the contracting parties.

TABLE-8.11 INDIVIDUAL FEES UNDER THE MADRID PROTOCOL

Contracting Parties	Designations Made in the International Application or Subsequent to the International Registration	Renewal
Benelux	189 for three classes, plus 17 for each additional class	309 for three classes, plus 55 for each additional class
China	345 for one class, plus 172 for each additional class	690 for one class, plus 345 for each additional class
Denmark	487 for three classes, plus 124 for each additional class	487 for three classes, plus 124 for each additional class
Estonia	291 for one class, plus 104 for each additional class	291 independent of the number of classes
Italy	112 for one class, plus 37 for each additional class	75 for one class, plus 37 for each additional class
Japan	1,139 for one class, plus 1,075 for each additional class	2,005 for each class
Singapore	260 for each class	183 for each class
Switzerland	600 for two classes, plus 50 for each additional class	600 for two classes, plus 50 for each additional class
Turkmenistan	320 for one class, plus 160 for each additional class	320 for one class, plus 160 for each additional class
United Kingdom	454 for one class, plus 126 for each additional class	504 for one class, plus 126 for each additional class

Note: All figures are in Swiss francs as of May 2002.

COPYRIGHT

The copyright system is simpler than the systems that deal with patents and marks, because formalities (such as registration and deposit) for the enjoyment and exercise of copyright are precluded as a matter of law by the Berne Convention.³¹ Some countries³² offer registration and deposit facilities as an option, for purposes of confirming and verifying rights and interests, for evidence in the event of litigation or infringement proceedings, and for use in financial and investment matters.

Statistics on registration are generally not readily available. However, the Copyright Office of the United States of America maintains such records and makes them publicly available. In this case, they are interesting, because while registration and deposit are generally optional (as required by the Berne Convention and the TRIPS Agreement), these statistics reflect activity in the busiest copyright industries in the world. For instance, for fiscal year 2000, the United States Copyright Office completed 515,612 copyright registrations.³³ From its beginnings in 1790 through 2000, the Office has made 29,131,112 registrations (most with deposited works).³⁴ This represents an archive of huge, multi-dimensional proportions, reflecting the cultural history and creativity of an entire nation. Even more important, it is open to the public, searchable, and available to teachers, scholars, students, business people, and lawyers, among others.

Without undercutting the value and obvious benefits which we have been witnessing in the cultural industries, it might be time to consider a system of optional registration and deposit of works, from the perspective of how they might positively affect economic development, particularly in developing countries. It is not possible to establish or operate a system of collective management without a clear system for the identification of the works to be managed. A simplified, cost-effective system for registration of works, and deposit of those works, is a modality by which collective management societies might be able to get a start in countries where there are currently no such societies operating. Repertoires and catalogues of local works could serve as the basis for licensing those works for public performance and thereby serve as a springboard for local musicians, songwriters, recording companies, and distributors. In short, local industries could be nurtured into national, even regional, industries.

CONCLUSION

This chapter has presented a systemic overview of acquisition and maintenance of IPRs. The facts and statistics, as well as the discussion and rationales, all point to the value of the IPR system, and likewise, to the necessity of enhancing and fine-tuning the system so that it operates and serves all levels of society and all countries of the world, to its maximum capacity. That system is definitely functional, but there are some areas where fine-tuning might produce even more benefits and meaningful results.

As business becomes more global, greater harmonization of the IP system can be seen as one of the key goals ahead. Harmonization includes creating more uniformity at the national and regional levels, and that occurs through international consensus as reflected in international instruments created, adopted, and embraced by the maximum number of Member States. It has been quite visible in the PCT, with its expanding number of contracting states, moves towards electronic filing, and the efforts underway to transform the PCT into a more advanced and flexible international patent system. On the marks side, the expanding number of Member States which are party to the Madrid system is favoring much easier acquisition and maintenance of global trademark rights at a fraction of the cost, in multiple countries.

WIPO has been, and must remain, at the forefront of these efforts to realize protection for IPRs at low cost, with ease and convenience, but always with certainty, reliability, and consistency based on professional expertise and know-how. Economic development and the business community demand this; Member States want it; and creative and innovative communities are motivated by it. It is the mandate of WIPO to support it, provide the environment where it becomes a reality, and to shepherd it into the 21st century and beyond.

- 1 Under the Paris Convention, all countries party to the Convention (163 countries as of July 15, 2002) are required to establish an IPO to perform this specific function.
- 2 Some examples are as follows: Ministry of Industry (France), Ministry of Justice or Law (Germany and Singapore), Ministry of Commerce or Economics (the United States of America and Argentina), Ministry of Industry, Commerce and Tourism (Brazil). WIPO, Christine Perrot, *The Organization and Management of an Industrial Property Office and Websites of National IP Offices*, WIPO/CEIPI/PI/SB/99/20, 1999. Links to national IPOs may be found at <http://www.wipo.int/news/en/>
- 3 <http://www.inpi.fr/inpi/html/quelqmots/index.htm>
- 4 <http://www.indecopi.gob.pe>
- 5 The time-frame for patent examination in the Republic of Korea was reduced from 28 months in 1998 to 24 months in 1999. The result was achieved by: (a) sharply increasing the number of examination personnel, (b) continuously entrusting prior art search to an outside prior art searching agency, (c) introducing a quick registration system for utility models, and (d) increasing the subjects qualifying for preferential examination systems. It is believed that a more expeditious granting of patents and utility models will increase the use of the system and its value for the business community, and make it more effective. See <http://www.kipo.go.kr/ehtml/eNewB01.html>
- 6 European Commission, **Commission Proposes the Creation of a Community Patent**, July 2000. http://europa.eu.int/comm/internal_market/en/intprop/ind-prop/2k-714.htm
- 7 WIPO, *Industry Advisory Commission, Report of the Third Meeting, May 4-5, 2000*.
- 8 In December 1999, KIPO announced that a Business Cooperation Agreement was reached with the Korea Patent Attorneys Association. Under the agreement, patent agents will provide free services on patent management to SMEs in their first application for a patent in a move meant to facilitate access to the IP system for such firms. KIPO press release, December 1999, <http://www.kipo.go.kr/ehtml/eNewB01.html>
- 9 WIPO, *Industrial Property Statistics (Geneva, 1999) and Trilateral Cooperation, Trilateral Statistical Report, (1999): 1*.

- 10 *WIPO, Alternatives to the Substantive Examination of Patent Applications* WIPO/ARIPO/IP/96/2, 1996.
- 11 *Ibid.*
- 12 *Trilateral Statistical Report 1999.*
- 13 <http://www.wipo.org/eng/pressupd/2000/upd92.htm>
- 14 www.ipaustralia.gov.au
- 15 *Calculated from WIPO 1998 statistics.*
- 16 *Hisamitsu Arai, Intellectual Property for the Twentieth Century: The Japanese Experience in Wealth Creation (Geneva: WIPO, 1999), 60.*
- 17 *WIPO, Regional Cooperation in the Field of Industrial Property* WIPO/CEIPI/PI/SB/14, 1999.
- 18 *Hamidou Kone, Regional Cooperation in the Field of Intellectual Property: the African Intellectual Property Organization (OAPI) WIPO/IP/HRE/98/13.Rev.1, 1998.*
- 19 *Mzondi Chirambo, The African Regional Industrial Property Organization (ARIPO): An Example of Regional Cooperation in the Field of Industrial Property* WIPO/SR/PRE/00/8&14, 2000.
- 20 <http://www.european-patent-office.org>
- 21 <http://www.eapo.org>
- 22 *Basic Facts about the PCT, <http://www.wipo.int/pct/en/index.html>*
- 23 www.wipo.int

- 24 See <http://patentagenda.wipo.int>
- 25 The task of the OHIM is to promote and manage marks and designs within the European Union. It carries out registration procedures for titles to community industrial property, it keeps public registers of these titles, and it shares with the courts in member states of the European Union the task of pronouncing judgment on requests for invalidation of registered titles. For further information, see <http://www.oami.eu.int/en/role/brochure/br1en09.htm>
- 26 The Paris Convention introduced the international requirement that contracting states provide for a trademark register.
- 27 For examples see: Article 46, Trademarks Act (R.S. 1985, c. T-13) of Canada (<http://laws.justice.gc.ca/en/laws/T-13/91316.html>); Article 7, Trademarks Law 32/1988 of Spain (<http://www.oepm.es>); or Sec.146, Intellectual Property Code of the Philippines (http://www.dti.gov.ph/iac-ipr/IP_Legislations/ra8293.html).
- 28 WIPO, *The Madrid Agreement Concerning the International Registration of Marks and the Protocol Relating to that Agreement: Objectives, Main Features, Advantages*, Publication No. 418 (<http://www.wipo.int/publications/marks/418/418.pdf>).
- 29 The schedule of fees and a list of the individual fees can be seen at <http://www.wipo.int/madrid/en/index.html>
- 30 WIPO, *The Madrid Agreement Concerning the International Registration of Marks and the Protocol Relating to that Agreement: Objectives, Main Features, Advantages*, paragraph 43.
- 31 Berne Convention, Article 5(2).
- 32 For example, India, Japan, the Republic of Korea, and the United States of America.
- 33 United States Copyright Office, 1999, 2000.
- 34 Figure courtesy of the United States Copyright Office, and Renee Coe.

CHAPTER 9

ENFORCEMENT OF INTELLECTUAL PROPERTY RIGHTS

This chapter will discuss the enforcement of IPRs, which is necessary basically because some people do not respect the rights of others. The reasons underlying such disrespect are many and varied, and range from greed, perceived necessity, lack of awareness, and ruthless criminal intent, all the way to innocent mistake. The scale of such disrespect also varies considerably, from copying a protected work in one's home to large-scale commercial criminal enterprises which produce hundreds of thousands of illegal copies. When illegal products take market share (or even kill a potential market), and when recouping an investment is prevented by intervening criminal activity, enforcement mechanisms are called into play to protect vital interests, not only of the players and entities mentioned, but also those of the public.

The essence of that classic maxim of common law, "a right without a remedy is no right at all," is equally applicable to the enforcement of IPRs. The carefully defined rights and interests which have been developed over time, which are reflected in various international treaties, conventions, and national laws, and which are granted or confirmed by the IP system, are completely negated if there is a failure in their enforcement. For it is when the necessity of enforcing one's rights is tested that the value of the rights is most clearly seen; the efficacy and long-term potential of the IPR system are most visibly displayed; and the friction caused by the intersection of theory, concept and intention, on the one hand, and reality, the marketplace and human considerations, on the other, tests the practical and ultimate values of the IPR system.

This chapter will also explore two egregious forms of IPR infringement, namely, counterfeiting and piracy,¹ as well as certain other timely and important issues, and in doing so, will seek to illuminate the seriousness of the problem. It will also seek to focus attention on the necessity for concerted action, enhanced public awareness, and galvanization of political will to eventually eradicate this problem and its negative effects on society.

MAGNITUDE OF THE PROBLEM

To get an accurate overview of the worldwide magnitude of the problem is difficult. Those who commit acts of counterfeiting and piracy generally do not file official reports on their sales. Seizures affect only a percentage of the overall market, and the extent of counterfeiting and piracy, including that which occurs in businesses, homes and in private situations, may never be known with certainty.

Notwithstanding the foregoing, intergovernmental organizations whose mandates touch on some aspect of counterfeiting and piracy and their effects, industry associations and nongovernmental organizations dealing with the subject have, based on facts and statistics within their respective purviews, estimated that the market in illegal, counterfeit products is between 5 percent and 7 percent of total world trade (see Table - 9.1). Job losses are estimated at 120,000 a year in the United States of America, and 100,000 a year in the EC, to give just two examples.

TABLE-9.1 ESTIMATED PROPORTION OF COUNTERFEIT AND PIRATED PRODUCTS

Organization	Estimate
World Customs Organization	Around 5% of all world trade
European Commission	Between 5% and 7% of world trade – representing EUR 200 to 300 billion a year in lost revenue
Organisation for Economic Co-operation and Development	More than 5% of world trade

Source: <http://www.interpol.int>; Commission of the European Communities, "Green Paper: Combating Counterfeiting and Piracy in the Single Market" (Brussels, 1998): 2; see http://europa.eu.int/comm/internal_market/en/intprop/indprop/922.htm; OECD, ICC Counterfeiting Intelligence Bureau, "The Economic Impact of Counterfeiting" #DSTI/IND(97)6/REV1 (Paris, 1998): 5.

According to the information supplied by certain sectors which are known to particularly suffer from illegally copied products, counterfeiting and piracy correspond to the following percentages of legitimate trade in the European Single Market, which are relatively high:

TABLE-9.2 COUNTERFEITING/PIRACY IN THE EUROPEAN SINGLE MARKET

Sectors Concerned	Rate of Counterfeiting/Piracy
Data processing	39%
Audiovisual	16%
Textiles	10-16%
Music	10%
Vehicle spare parts	5-10%
Sport and leisure	5-7%

Source: http://europa.eu.int/comm/internal_market/en/intprop/indprop/counterf.htm#2

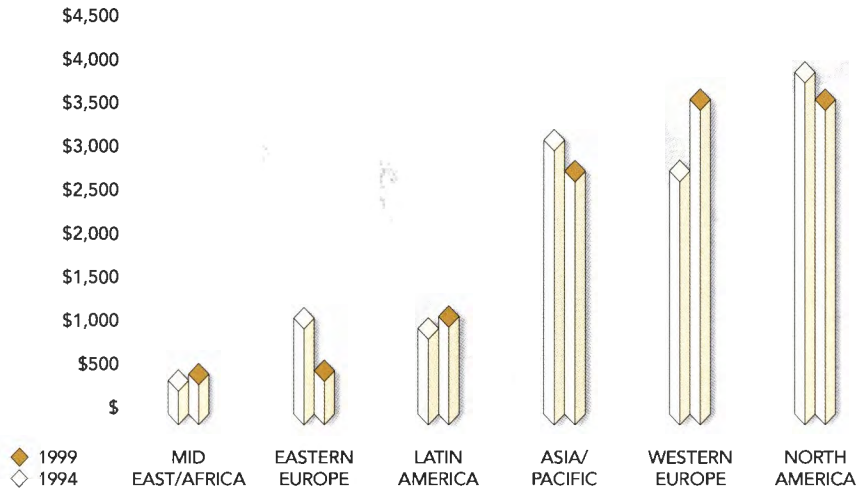
TYPICAL AFFECTED PRODUCTS

COMPUTER SOFTWARE

This is the most affected of all products and industries touched by counterfeiting and piracy. In their *Global Software Piracy Report*, the Business Software Alliance (BSA) and the Software & Information Industry Association (SIIA) report findings that are disheartening but also encouraging (see Chart - 9.3).² The global piracy rate for PC business software applications was an astounding 36 percent according to this study. However, it was 49 percent in 1994, a decline of 13 percentage points in five years.

Notwithstanding the percentages, the industry calculates that it lost US\$12 billion in 1999,³ a staggering amount, especially when one compares that number, for example, to the budget of the United Nations, which was US\$2.54 billion for the 2000-2001 biennium.⁴

CHART-9.3 SOFTWARE PIRACY LOSSES BY REGION (US\$BILLIONS)



Source: Business Software Alliance and Software & Information Industry Association, *Global Software Piracy Report (May 2000)*: 3.

MUSIC

The music industry is also heavily affected, reflecting the underside of the digital revolution. Exact copies of music-bearing products are easier than ever to reproduce. In its *Music Piracy Report 2000*, IFPI reports that in 1999 the global pirated music market was estimated to have totaled 1.9 billion units. CD piracy increased to 500 million units, leaving music cassettes to account for 1.4 billion pirated units. The report notes that CD-recordable units made a significant impact.⁵

The cost of this piracy: an estimated US\$4.1 billion. It is slightly less than in 1998, reflecting lower prices for illegal recordings and lower sales of illegal music cassettes. The report does note that world capacity for optical disk manufacturing rose 28 percent in 1999, and increased more than 340 percent over the past five years. Internet piracy rose dramatically in 1999. While it is almost impossible to ascertain the exact number of illegal downloads via the Internet, Forrester Research estimated that there were more than one billion illegal downloads of music files in 1999.⁶ The

piracy of musical works over the Internet is a different topic, although closely related, to that of counterfeit CDs and music cassettes.

FILMS

The counterfeiting and piracy of films and other audiovisual productions occur in two basic forms: illegal diversion of cable and satellite delivery, and physical copies, generally in the form of videocassettes. Focusing only on the sale of physical copies, the Motion Picture Association (MPA) estimates that worldwide video piracy costs American motion picture companies US\$2.5 billion a year in lost revenues. As one example of video piracy in action, in June 1996, a pirate video operation was dismantled in New York. It was an illegal business which sold more than 100,000 pirate videos a week, and grossed more than US\$500,000 a week.⁷

The OECD, in its report *Economic Impact of Counterfeiting*, estimates that the video piracy rate for some countries can reach almost 100 per cent.⁸

LUXURY GOODS AND FASHION WEAR

This is an area where the public's (and often the government's) attitude that this is a very soft crime, not more than mere mischief, is both prevalent and detrimental to the enforcement of legitimate rights. Counterfeit copies of luxury goods, especially fashion wear, proliferate, most notably in Europe where the major manufacturers are located. One common technique in this area is to import the fake clothing or items from one country, and to manufacture or import the labels from another. The fake labels are attached in the country of intended sale, thus making it much more difficult to identify fake goods in transit while these goods are in sufficiently large quantities to justify governmental enforcement action. One major source of these fakes are legitimate sub-contractor manufacturers, facilities which are legitimately authorized to manufacture original items, but who manufacture far in excess of the ordered amount, and sell the overruns out the back door at greatly reduced prices. Overruns create a sort of gray market: they are items illegitimately manufactured by a

legitimate manufacturer, which are illegitimately sold or placed in the stream of commerce. Such overruns are essentially counterfeit goods which negatively affect the economy.⁹

SPORTSWEAR

The 1990s saw a huge upsurge in all things sports-related. Sports is big business, but so also is the sporty, healthy lifestyle, with a dramatic increase in spa and fitness facilities, and the proliferation of diets, healthy life books, and so forth. Counterfeit sports wear is facilitated by several factors. The biggest segment of the market for these items is the youth market, the segment most willing to buy, even search out, counterfeit goods with well-known brand names at lower prices. The market for these items is also easily reachable, since, to a large extent, it centers around major events, particularly sport and music events. Mobile vendors of counterfeit goods are present in numbers at these events, and evidence suggests that these vendors are internationally organized and funded. Because they generally carry small inventories to these events, governmental authorities are restrained from putting a heavier emphasis on, or using more resources against, them. Another factor which helps this area to prosper is that buyers mostly just want the brand name; counterfeiters can easily attach fake labels onto ordinary clothing, and thereby satisfy large numbers of the youth market.¹⁰

PERFUMES

Perfume products are generally sold in established retail outlets, which lend price stability and authenticity to the market. However, the industry is experiencing attacks from counterfeiters and estimates that its losses in this area are greater than 5 percent of its total turnover. A willing public will generally purchase counterfeit perfumes from smaller shops and street vendors at so-called bargain prices, where it is often claimed that the goods are stolen, but are the real thing.

Toys

The toy industry can be divided into traditional toys, and the rapidly growing electronic toy industry. Traditional toys are often copied, and

then sold under different names and trademarks, rendering infringement actions close to impossible. Electronic games are an ever more serious problem. Video games, such as those created for the handheld Nintendo best seller, the Gameboy™, are copied and sold in huge numbers. Nintendo estimates that its losses in the United States of America alone for 1996 were in excess of US\$800 million.¹¹

AIRCRAFT COMPONENTS

Despite the fact that the legitimate market for aircraft parts is a heavily regulated industry, counterfeit aircraft parts slip into the chain of supply and distribution and can result in death and injury. The origin of counterfeit aircraft parts, where it can be ascertained, indicates that, with respect to accidents in the United States of America caused by such parts, more reported incidents involved parts produced in the United States of America than in other areas of the world.¹² It is reported that the number of incidents of detection of unapproved parts has been positively affected by industry and government cooperation: 52 incidents in 1991; 262 in 1992; 411 in 1994; 317 in 1995; and 220 in 1996.¹³

AUTOMOBILE COMPONENTS

This is an emerging growth area for counterfeiters, who target short-duration products, such as standard parts which are or can be sold off the shelf, or which can be fitted to different makes and models of automobiles. Such parts are less likely to carry any security device or anti-counterfeiting technology. The industry estimates its losses from counterfeit parts to be US\$12 billion per year, with the vast majority of that taking place in Europe.¹⁴

PHARMACEUTICALS

Because of the dramatic effects which counterfeit pharmaceuticals can have on public health and safety, including the death of unsuspecting victims, this is an area which currently receives more attention than ever before. The problem of counterfeit drugs and medicines is most acute in certain developing countries, where there might not exist a regulatory infrastructure to prevent or curb the problem. According to a recent

OECD report on counterfeiting, the main factors underlying the problem of counterfeit pharmaceuticals in developing countries are: “weak drug regulatory control and enforcement; scarcity and/or erratic supply of basic medicines; uncontrolled distribution chains; large price differentials between genuine and counterfeit medicines; lack of effective IPR protection; lack of regard for quality assurance; and corruption of the health care system.”¹⁵ It is estimated by the WHO that 6 percent of worldwide pharmaceutical sales are counterfeit, and that up to 70 percent of all medicine sold in some countries is counterfeit.¹⁶

WATCHES

It is estimated that 5 percent of global trade in watches is counterfeit. It is interesting to note that in some countries, such trade creates a barrier to the sale of legitimate products. The difficulties encountered by some governments in enforcing IPRs, and the public perception in some quarters that such counterfeiting is business as usual, all serve to hamper any efforts to beat back the illegal trade.¹⁷

WHY COUNTERFEITING AND PIRACY ARE INCREASING

Advances in new technologies, particularly digital and computer-related technologies, have produced marvelous new products and services which make our lives more pleasant and more interesting, and which empower the individual as never before. Cultural activities, such as music, film, literature and art, are enhanced on an almost daily basis. New medicines and vaccines, and new medical treatments, are reported so frequently that we start to take for granted the amazing power which exists to fight disease and sickness, prolong our lives, and reduce suffering in the world. Some of these technological advancements have not been used for the public good.

Manufacturing now accounts for more than 75 percent of total world exports.¹⁸ Manufacturing is a value-adding process. While manufacturers are constantly adding value to existing products, they are, at the same time, creating new products; and this creates market demand.

By increasing market demand for their products so effectively, manufacturers are also, unintentionally, creating a market for counterfeit products, which are almost always lower in price. Manufacturers are thus victims of their own success. Price differences between various markets, which are often strategically segmented by manufacturers and distributors, are reflected in pricing policy, underscoring a significant gap in consumer purchasing power in different countries. This policy often drives people to produce and distribute counterfeit goods in their local market. As counterfeiting activities have become rampant, counterfeiters create distribution channels and establish an economic and even political presence in society. Some economies are supported by these activities which create local job opportunities.

Emerging markets are producing an increase in demand of startling proportions for well-known products, which legitimate manufacturers have been unable to completely satisfy. This extraordinary demand for goods and products has outstripped the abilities of the enforcement agencies to monitor and protect against counterfeit products.

Certain new technologies have allowed easier reproduction of IPR bearing products and goods and facilitated the reproduction of products in nearly every field where there are eager customers or market demand for the legitimate products. Cultural products, such as music, films, computer products, and literary products, are easily reproduced and foisted onto the public, facilitated in large part by new technologies.

International trade has increased substantially in the past few decades, for several reasons, including: standardized rules and remedies applicable to the multi-lateral trading system; increased telecommunications capacities; the rise of the Internet; and the effectiveness of manufacturers in branding their products, creating market demand, and producing products which are designed to satisfy that market demand. Increased worldwide demand for goods and products and a corresponding lack of proportional increase in worldwide enforcement mechanisms needed to support that demand and production, such as customs, police, and judiciary, allow for cracks and niches in the system. Counterfeiters are right there, ready to fill those cracks with counterfeit goods.

ORGANIZED CRIMINAL INVOLVEMENT

Because of high-profit potential and relatively low risk, organized criminal elements are deeply involved in counterfeiting and piracy. Profits from counterfeiting and piracy are often used to fund other criminal activities; and unfortunately, the criminal enforcement infrastructure, as well as the public, does not always view counterfeiting and piracy as the serious crimes that they are. The active involvement of organized crime in counterfeiting and piracy is a proven, irrefutable fact. International criminal organizations produce, distribute, sell, and traffic in counterfeit and pirated goods for several reasons: it is lucrative; it is often a low-risk activity; and it funds other activities where the risk, as well as the rewards, are much greater.

A disturbing attitude has existed in the public, and sometimes in the judiciary, and in law enforcement agencies, that counterfeiting and piracy are low-level mischief and of little consequence. The dedicated efforts of many organizations and governments have finally started to change this misperception. The results and consequences of the involvement of organized crime in counterfeiting and piracy can be quite serious. Organized crime is almost always involved in commercial-scale counterfeiting and piracy operations.¹⁹ The profits from such operations are then channeled into other criminal operations. It is a connection which is dangerous and, as discussed in the next section, leads to unwanted and serious short-term and long-term consequences.

ECONOMIC CONSEQUENCES

INTELLECTUAL PROPERTY RIGHT HOLDERS AND LEGITIMATE MANUFACTURERS

A more subtle, but no less worrisome, dimension is the effect of the economic consequence of counterfeiting and piracy upon society. Because counterfeiting and piracy are illegal, many of the normal elements associated with legitimate business are removed, and as a result, benefits are denied society at different levels. Initially, loss of direct sales revenues is

experienced by legitimate manufacturers. The size of such loss is monumental, often beyond our comprehension. Credible estimates of lost sales revenue by legitimate manufacturers are shown in Table - 9.4.

TABLE-9.4 LOST SALES REVENUES IN SELECTED SECTORS

Industry	Loss of Direct Sales
Pharmaceuticals	US\$12 billion in 1999
Music	US\$4.1 billion in 1999
Computer software	US\$59 billion over five years to 1999

Source: <http://www.interpol.int>; IFPI Piracy Report: 2; <http://www.bsa.org>.

Counterfeit goods are almost always inferior in quality to the originals. When the unsuspecting public discovers that, there is a loss of confidence in the system by which goods are manufactured and distributed, as well as a loss of goodwill toward the manufacturer. Enterprises lose future sales as a result. Prices paid for inferior quality counterfeit and pirated goods are often excessive or inflated in comparison to the quality.

NEGATIVE IMPACT ON LOCAL INDUSTRIES

Those countries in which counterfeiting and piracy take place suffer losses on several levels, both tangible and intangible. When it is shown by credible evidence that counterfeit and pirated goods are being manufactured in a country and there is little or no focused government effort to prevent such manufacturing from taking place, the harmful reputation which this creates discourages manufacturers of legitimate goods from establishing their facilities in those countries. Such decisions result in a loss of FDI, as well as the concomitant technology transfer and foreign know-how which normally accompany FDI. Loss of FDI also manifests itself in a loss of foreign income, which ultimately affects a country's balance of payments.

The cycle continues in ways which hurt not only foreign manufacturers but a country's local industry. Local creators, inventors, and SMEs, which might have focused their efforts and resources on the same products, are often discouraged by the certainty that their products will be illegally

copied and sold, thus precluding a return on investment and future growth, as well as the very spirit and energy which are an integral part of the creativity process towards a knowledge-based economy.

SOCIAL CONSEQUENCES

The social consequences of counterfeiting and piracy are felt most personally by those artists, creators, and entrepreneurs who compete directly against the illegal products. As an example, local musicians, music groups, record companies, and distributors cannot put out a record or CD; and their products (embodying local and national artists) are pushed out of the market by the counterfeit copies, which are sold at a lower price, and generally with none of the artwork, lyrics, or printed material which accompany legitimate copies, and certainly no guarantee as to quality. As this example of music shows, local creativity and culture are strangled by counterfeiting and piracy; the country and its citizens are the ultimate losers in this scenario, as inadequate respect for cultural works and heritage counters national efforts to promote indigenous culture and identity.

Counterfeiting of medicines, and airplane and auto parts has a detrimental effect on the health and safety of the public.²⁰ The WHO estimates that approximately 6 percent of pharmaceutical sales worldwide are counterfeit. Developing countries account for the largest portion of such sales. According to some estimates, up to 70 percent of all medicine sold in some African countries is counterfeit.²¹

While counterfeit medicines are more of a problem in developing countries, their effects are universally felt by all. Counterfeit paracetamol syrup cost the lives of 109 children in Nigeria.²² In 1981, the pharmaceutical company Searle discovered that over one million counterfeit birth control pills had been distributed to unsuspecting women, resulting in unwanted pregnancies and irregular bleeding. The United States Food and Drug Administration recalled US\$7 million worth of intra-aortic pumps used during open-heart surgery after it discovered malfunctioning counterfeit parts in them. A counterfeit version of the antibiotic Ceclor™ caused children in seven states in the United States of America to suffer painful ear infections and possibly permanent ear damage. In Mexico,

a counterfeit version of the powerful skin medicine Retin-A contained only vitamin A cream.²³

With respect to counterfeit aviation and auto parts, several incidents have resulted in death. In 1989, a Norwegian airplane crashed, killing 55 persons. The cause was reported as substandard counterfeit bolts. In 1991, General Motors Corporation investigated an auto accident in which a mother and her child were killed. The results indicated that counterfeit brake parts had caused the accident; the counterfeit brake pads were made out of wood chips. A helicopter crash in 1987, which caused the death of a reporter, was caused by a counterfeit clutch; upon further investigation, it was learned that similar accidents had occurred, and that more than 600 helicopters, some sold to NATO, were equipped with the same counterfeit parts.²⁴ These examples highlight the fact that purchasers of counterfeit goods do not have the same benefits and protection that purchasers of authentic goods enjoy, including warranty protection and the advantages that derive from use of products that have had the benefit of regulatory review.

The lesson from just this aspect of counterfeiting is clear, and must be taken seriously: people can die when criminals foist counterfeit items, especially medicines, and auto and airplane parts on an unsuspecting public.

INTERNATIONAL LEGAL FRAMEWORK

Counterfeiting and piracy are most certainly current subjects of attention; however, they are not new subjects. In the 1800s, certain manufacturers of goods, particularly tools, cutlery, cotton thread and other commodities, noticed that their goods, and their marks were being copied in newly industrializing countries. Their complaints, which were similar to ones being leveled in the book publishing field by noted authors, led to the creation and adoption of international treaties to deal with the protection of IPRs. The Paris Convention for the Protection of Industrial Property was adopted in 1883, and the Berne Convention for the Protection of Literary and Artistic Works was adopted in 1886.

These two landmark international instruments established certain principles relating to counterfeit and pirated goods, which are deemed integral today in protecting IPRs and in creating orderly markets. The conventions provide that disputes between countries can be brought before the International Court of Justice (Paris Article 28 and Berne Article 33); no Member State has ever resorted to this remedy.

A solution to the problem through an international instrument was first taken up in the Uruguay Round and resulted in the TRIPS Agreement. Part III of the TRIPS Agreement specifies certain minimum standards for the enforcement of IPRs. All Members are obligated to implement these standards, which include General Obligations, Civil and Administrative Procedures and Remedies, Provisional Measures, Special Measures Related to Border Measures, and Criminal Procedures. These provisions establish procedures which, for the first time in an international instrument, require signatories to provide that IPR holders can effectively assert their rights, seize infringing goods, seek remedies against criminal enterprises and infringing goods, and seek the assistance of those agencies of government which have responsibilities in these matters, such as the courts, police, customs, and other administrative agencies.

On another level, when Members of WTO have disputes with other Members concerning, *inter alia*, the effective enforcement of IPRs, they are able to proceed in certain stages to bring their complaints through the Dispute Settlement Mechanism. These procedures are based upon mandatory jurisdiction in the WTO where there are sufficiently weighty remedies to ensure compliance, and in the event of proven noncompliance, to effect remedial compensation to the aggrieved Member. This is a noteworthy experiment in support of intellectual property, in support of the expansion of the multilateral trading system, and in support of creativity and innovation.

The rapid development of digital technology and global telecommunications capacities, while providing us with many benefits, has also produced a situation in which copyright and related rights works have been rendered vulnerable to on-line abuse and infringement. The world copyright community came together in December 1996, at a diplomatic conference hosted by WIPO, and in response to the growing threat of digital-

based infringements, adopted the WCT and WPPT. These treaties address substantive rights, but also, for the first time since 1971, upgrade and clarify international standards for the protection and enforcement of copyright. Most noteworthy is the refinement and clarification of the Right of Communication to the Public (which derives from the Berne Convention and includes making available works over the Internet), and the Obligations Concerning Technological Measures of Protection. These latter provisions are new tools, and in the countries which have implemented them in their national legislation, new legal actions are being taken and a new body of case law is growing up, which successfully take the enforcement fight into cyberspace.

POSSIBLE MEASURES

At the national level, a number of governments are reinforcing their legal framework and institutional arrangements to comply with the above-mentioned international treaties. Generally, enforcement of IPRs can take four basic forms:

- Administrative enforcement, such as seizure of infringing goods by a customs office;
- Criminal enforcement, in which the state, generally through the police, is the moving party in a criminal action against the infringer;
- Civil enforcement, in which the right holder, or someone in possession of valid rights, such as an assignee or licensee, takes prescribed legal action, such as in court by filing a civil action against an infringer, and perhaps seeking an injunction;
- Technological enforcement, in which producers of products and services employ technological means to protect IPRs against infringement (for example, encryption of digital copyright works).

These measures are limited to applicable laws (for example, in many countries, criminal enforcement is not applicable in the case of a patent infringement). Administrative measures and civil measures are linked in some countries. It is hard to determine the extent to which the state should use public resources to help enforce a private party's right. However, effective enforcement has become an international obligation under the TRIPS Agreement, as it is vital in promoting trade and fostering fair competition in market-oriented economies. Advantages and disadvantages are shown in Table - 9.5.

TABLE-9.5 COMPARISON OF VARIOUS ENFORCEMENT MEASURES

Measures	Moving Party	Relevant IPR	Advantages	Disadvantages	Emerging Trends
Administrative	Customs office	Mark, copyright	Relatively expeditious	Effective only in obvious cases	Regional cooperation on border control
Criminal	Police	Mark, copyright	Effective, relatively expeditious	Limited to serious cases	Increase of fines, more raids for educational effect
Civil	IPR holder	All IPRs	Reasonable remedies	Time-consuming and expensive	IPR special court, Alternative Dispute Resolution (ADR)
Technological	Producer of IPR works	Copyright, mark, patent	Practical, speedy	Vulnerable to hacking	Standardization efforts for water-marking

ADMINISTRATIVE ENFORCEMENT

Administrative enforcement of IPRs takes place in an administrative agency or body of government separate from the courts where civil or criminal enforcement is most visibly conducted. The most notable example of administrative enforcement is the customs authorities. Customs has a more visible and important role with respect to enforcing IPRs at the borders, as the TRIPS Agreement provides detailed provisions on customs procedures.

For example, in 1999, 25 million counterfeit articles were seized at EU borders; by 2001, that number had risen to 95 million. To combat the increasing menace of counterfeiting and piracy, the EC is planning to enact enhanced legislation, starting with a plan for concerted action across a wide spectrum of agencies and branches of government, to be followed by a proposed new directive.²⁵ The situation in China is another example which deserves attention. In 1998, administrative authorities handled 28,952 cases of IPR violations and seized 400 million infringing items.²⁶ In January 2000, customs officials at Hong Kong SAR uncovered a criminal video disk production operation; two production lines were closed down, and 400,000 illegal disks were seized. In 1999, authorities at Hong Kong SAR seized 16 million illegal optical disks, and arrested 2,701 people for piracy offenses.²⁷ Large scale anti-piracy operations by the customs authorities at Hong Kong SAR, with creative names such as Thunderbolt and Terminator, have also been successful in seizing hundreds of thousands of CDs and illegal production equipment.²⁸

Due to the low policy priority given to IPR enforcement, customs offices in many countries have scarce resources to combat counterfeiting and piracy at the border. Seizures of counterfeit and pirated goods require close and expeditious cooperation from IPR holders and access to relevant information to identify the goods to seize. Databases of registered and well-known marks are particularly useful for officials of the custom office (see Box - 9.6).

BOX-9.6 DATABASES FOR ANTI-COUNTERFEITING

The Réseau Européen Anti-Contrefaçon (REACT) was formed in June 1997 by the Dutch and Belgian anti-counterfeiting associations. It is supported by the EC, and is gaining in resources and results. Among other activities, it operates a central database in support of law enforcement, investigations, and national associations fighting counterfeiting and piracy. In 2000, REACT assisted in 1,150 seizures of illegal goods, including 750,000 merchandise items, 120,000 perfumes, 460,000 textiles, and 185,000 watches. One seizure in December confiscated 1,000 kilograms of counterfeit medicines.

Source: <http://www.REACTEU.org>.

PARALLEL IMPORTS

In seizing infringing goods, it is difficult to distinguish between parallel imported goods and counterfeit goods – if a given country permits parallel importation. Parallel imports (also known as or referred to as gray market goods) involve cross-border trade in a product without the permission of the manufacturer or right holder. This type of trade generally occurs where there is a significant differential in price, quality, or availability of the subject product in the second country. Parallel import products are often distinguished from counterfeit or pirate goods, since they were legally manufactured and sold in the first country, and in some countries their importation is legal. From the viewpoint of IPR owners, parallel imports frustrate their efforts to effect the distribution of goods in order to serve territorial markets and promote competition, because distribution channels are believed to promote orderly and effective distribution of products, and restrictions on parallel importation promote and protect such channels. However, from the viewpoint of consumers and civil society, parallel imports promote more competition resulting in greater variety and choice of goods and lower prices as long as the goods are genuine.

Manufacturers and IPR holders enforce their rights in gray market situations through a variety of means, including: the establishment of protective national legislation (for example, as part of the IPR regime); regulatory

barriers, such as those relating to public health and safety; restrictive contracts with distributors and vendors; disclosure requirements; competition laws; and warranty and consumer rights issues.²⁹

The complexity and sensitivity of the issue can be seen quite clearly in how the negotiators of the TRIPS Agreement dealt with it. Article 6 (Exhaustion) of that Agreement states in part: "...nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights." In the Declaration on the TRIPS Agreement and public health that was adopted on November 14, 2001 at the WTO Ministerial Conference in Doha, it was stated that "the effect of the provisions in the TRIPS Agreement that are relevant to the exhaustion of intellectual property rights is to leave each member free to establish its own regime for such exhaustion without challenge, subject to the MFN and national treatment provisions of Articles 3 and 4." This means that, if the policy on parallel imports is decided by applying the theory of the exhaustion of IPRs, the issue of parallel imports in the WTO framework is exclusively an issue for national legislation (the issue is also dealt with in some regional trade agreements, such as with the EC and with the North American Free Trade Agreement). However, the policy on parallel imports is often determined by factors regarding trade, competition and economy rather than those relating to intellectual property. Theories of intellectual property, such as the exhaustion of IPRs or the first sale doctrine, alone are not likely to provide the best solution to this problem.³⁰

CRIMINAL ENFORCEMENT

There is fairly general agreement that the most effective methods and procedures in the fight against infringement of IPRs are those involving criminal enforcement. Criminal law imposes different standards for liability that are generally harder for the prosecution to meet than in civil cases, however, criminal penalties are more onerous. Large-scale, commercial counterfeiting and piracy operations have traditionally looked upon civil fines as merely the cost of doing business. However, when the threat, or especially the reality, of prison is introduced into the mix, real enforcement starts to take shape.

With the coming into force of the TRIPS Agreement, and with its applicability to a large number of developing countries on January 1, 2000, a legal framework, with very specific guidelines, provided both the structure and the incentive to make criminal enforcement more effective and more widespread. Many activities and initiatives are taking place at the national and regional levels, and, as will be seen by the examples hereafter, there is a changing, more positive attitude about dealing with these serious problems caused by counterfeiting and piracy.

The following examples, a few of many, give the flavor and texture of what has been developing in the expanding area of criminal enforcement of IPRs.

In Malaysia, the Business Software Alliance (BSA) has been assisting the government to fight large-scale software piracy. During the period of April to June 1999, 4,629 raids were conducted for the purpose of seizing illegal software products. Under the Malaysian Copyright Act, infringers can face not only stiff fines, but up to five years in prison.³¹

One thousand inspectors fanned out across China in December 2000, in search of counterfeit auto parts. They raided 248 retail outlets and uncovered over 30,000 counterfeit auto parts, including such potentially dangerous items as axles and brake parts.³³

In December 2000, officers from the Independent Commission Against Corruption of Hong Kong SAR seized 500 illegal stampers, the machines which make CDs. These machines, which had a value of US\$400 million, were being used to illegally manufacture CDs of films, music, computer software, and video game software.³²

In Singapore during 2000, coordinated efforts by the government and police resulted in 1,398 separate raids on illegal operations, 1,455 persons arrested, and 1,559,840 illegal articles seized and taken off the market. Those arrested included 180 members from seven separate criminal organizations.³⁴ In the Philippines, National Bureau of Investigation officers seized counterfeit Caterpillar™ truck parts.³⁵ Police in New Delhi, India, raided a small shop and seized over US\$1 million worth of illegal CDs of music and computer software; the owner of the shop faces up to three years in prison.³⁶

The above examples are presented because they indicate both the scope of the problem, and the type and strength of the response which is necessary to achieve positive results in this area. The following two examples are presented because each represents what might lie ahead in respect to newly evolving problems and solutions.

In the first case of its kind, Fakegifts.com used the Internet to sell counterfeit products. This site, based in South Carolina, the United States of America, offered replicas of such items as Cartier™ and Rolex™ watches, Montblanc™ pens, and well-known handbags and belts. Under US federal law, the two proprietors of the site face ten years in prison and a US\$2 million fine for each trademark infringement count.

Because of the growing complexity of IPR legislation, as well as the specificity of knowledge required to properly understand and execute the laws, Thailand established a Central Intellectual Property and International Trade Court in 1997. With respect to its IPR functions, the Thai IP Court has exclusive jurisdiction in both civil and criminal matters concerning the enforcement of IPRs. This novel, commendable approach seeks to ensure that its assigned judges possess and build up specialization of knowledge in IP legislation and practices, while at the same time, the Court stresses user-friendly, cost-effective, and expeditious procedures, including emphasis on the use of arbitration and more effective pre-trial conference procedures.³⁷ While such specialized courts are not necessarily the best solution for every jurisdiction and legal system, they provide an interesting model that many countries may find useful.

CIVIL ENFORCEMENT

The TRIPS Agreement³⁸ requests Member States to provide the legal infrastructure and mechanisms necessary for IPR holders to vindicate their rights, to stop infringements at the outset, to gather necessary evidence, and to seek appropriate and effective remedies relative to the particular situation, including *ex parte* injunctions, seizures, destruction of infringing goods and damages, which could include the cost of suit and attorney's fees.

Civil enforcement can be an effective tool against counterfeiters, although criminal enforcement is the preferred course against such abusers of the IP system. However, civil litigation in IP infringement cases has markedly increased with substantial damages being awarded in many cases (see Box - 9.7).

BOX-9.7 TOP PATENT VERDICTS IN THE UNITED STATES COURT OF APPEALS OF THE FEDERAL CIRCUIT

Polaroid vs. Eastman Kodak	US\$873 million
Smith International vs. Hughes Tools	US\$204 million
Pfizer vs. International Rectifier	US\$ 55 million
Shiley, Inc. vs. Bentley Laboratories	US\$ 44 million

Source: WIPO, document WIPO/IP/MNL/00/7(b): 6.

Enforcement of patent rights varies in complexity, duration, and cost, for instance:

- In Australia, about 20 to 40 patent infringement cases are initiated each year, but only about 10 percent of them actually proceed to trial, which typically takes place one to two years after filing suit. However, the cost attendant on patent litigation can be in the range of US\$53,410 to US\$267,050,³⁹ which can include attorney's fees.
- In the Republic of Korea, patent infringement actions can take as little as three to four months, and judgment can include attorney's fees and costs.
- In Germany, patent infringement actions are more costly because lawyer's fees are regulated by the state, and lawyers are not allowed to charge less than a specified minimum. A full infringement action there typically takes 12 to 18 months.
- In Mexico, a typical patent infringement action takes about three years, and the cost is generally in the range of US\$50,000 to US\$100,000.⁴⁰

Due to the technical complexities involved in patent infringement cases and in an attempt to provide uniform interpretation of patent claims, some countries have established special arrangements in the court system so as to consolidate patent cases. For example, in 1982 the United States Court of Appeals for the Federal Circuit was established with the mandate to hear appeals on patent cases decided by the various United States district courts in order to bring about more consistency.

An effective judicial system to resolve the claims of IP right holders is a necessary element of any IP system. If a judicial system is relatively weaker than that of other countries, the right holder starts international forum shopping, which will undermine the home country's IP policy.

CONFLICTS AND CHOICE OF LAWS

Because of the expansion of global activities which are involved with IPRs, an area which requires increased attention, from the perspective of international harmonization, is the body of disparate laws and legislation known as private international law. This body of law comes into play when civil litigation involves parties or fora in more than one country. With globalization of business and expanding technological development and telecommunications capacities, noticeably more international litigation is being pursued.

Litigants and their lawyers find that the laws of all countries are not the same; moreover, the laws differ so much in some cases as to affect the outcome of litigation matters, depending in which country's courts the plaintiff decides to initiate the litigation. Because of this disparity in applicable laws, efforts are underway to further and more satisfactorily develop principles of applicable law, so that the application of law in enforcement contexts will be fair and predictable. Issues such as jurisdiction, damages, and choice of applicable laws are at the heart of such initiatives.

As an example regarding jurisdiction, it is interesting to see how the computer software firm Novell recently sued its distributor and contracting party in the Republic of Korea, Myung Je, for copyright and trademark infringement. The district court hearing the case was in Utah, United States of America, although all of the illegal activity occurred in the Republic of

Korea. Novell's in-house anti-piracy group had investigated over 2,400 cases of software piracy in 1999.⁴¹

At present, no international agreement exists on international jurisdictional questions. Of special mention in this regard is the initiative underway to negotiate and ultimately adopt the Hague Convention on Jurisdiction and Foreign Judgments in Civil and Commercial Matters.⁴² At present, this initiative is not concluded, as many issues remain; however, it is safe to say that the lack of international rules could have negative effects on global economic activities, particularly in e-commerce with respect to digital works protected by intellectual property.

BOX-9.8 "LOVE IS A WONDERFUL THING"

On January 22, 2001, the largest verdict ever, concerning a single musical composition was finalized in a music infringement case in the United States of America. The popular singer Michael Bolton was sued on account of his hugely popular musical composition "Love Is A Wonderful Thing," for allegedly infringing a musical composition written by the 1960s musical group the Isley Brothers; both songs had the same title. Bolton's song was popular in 1991; the Isley Brothers' song was a hit in 1966. The jury at the district court level, in 1994, decided that there had been infringement. The United States Supreme Court affirmed the award of the lower court, in spite of the absence of proven direct access, which was implied due to the widespread playing on the radio of the Isley Brothers' hit: US\$5.4 million in monetary damages, 66 percent of all future royalties from the single, and 28 percent of royalties from the album on which the single appeared.

Source: <http://www.law.com>

ALTERNATIVE DISPUTE RESOLUTION (ADR)

Another modality for administrative enforcement of IPRs is seen in the rapidly growing and quite promising area of ADR and, in particular, arbitration. A less expensive, more expeditious, and less resource-intensive method of resolving disputes, ADR is surfacing in many different fora as a very viable alternative to civil litigation.

ADR procedures can be either mandatory or optional, and their results can be either binding, as typically in arbitration, or nonbinding, as in mediation.

One example of ADR specifically tied to domain names (and their overlapping into the area of marks and especially well-known trademarks) is the WIPO Arbitration and Mediation Center's involvement in domain name disputes. As one of four current providers of dispute resolution services under the scheme established by the Internet Corporation for Assigned Names and Numbers (ICANN), which has become the overarching administrative body for the Internet, WIPO has received the largest percentage of domain name cases filed, more than 60 percent.

The use of ADR offers many advantages to the problems, backlog, delays, and costs associated with civil litigation. It is generally operated by an agency or body other than the authority which operates the civil courts. As a growth area, it offers unique benefits in enforcing IPRs, and it will certainly loom large in the future of global businesses and their evolving use of IPRs. With its Rules for Arbitration, for Expedited Arbitration and for Mediation and its Recommended Contract Clauses, which are tailored to the specific characteristics of intellectual property disputes, and its extensive database of specialized arbitrators and mediators from a multitude of jurisdictions, the WIPO Arbitration and Mediation Center is poised to play an effective role in this regard.

TECHNOLOGICAL ENFORCEMENT

After sustaining years of financial losses as well as the loss of the goodwill of their customers, businesses have made great efforts to create and deploy technological measures to protect their products from counterfeiters and pirates, and in many cases, to protect the public from dangerous copies. Technological enforcement is a fast-changing dimension in the world of enforcement. It is expected to be used as a practical and effective measure, particularly in the context of e-commerce. Indeed, the

WIPO Internet Treaties, the WCT and WPPT, for the first time oblige Contracting Parties to provide legal protection and effective remedies against the circumvention of effective technological measures that are used by the right holder.

This area is fast changing because, as the saying goes, "What one man can create, another can copy." This applies not only to the products themselves, but also to the technological means of protection. Conceptually, technological measures must be designed to shift the balance of risk to the counterfeiter; the probabilities are thus higher that he or she will get caught, pay a large fine, and perhaps go to prison.⁴³ This concept permeates the design and deployment of technological measures.

In order for technological measures to be successful in their assigned roles, they must be sensitive to cost, which is ultimately passed on to the consumer. If the price of the technology protecting the product doubles its cost, it will be unuseable; likewise, if the technological measures disrupt normal distribution of the product or are unfriendly to the consumer, for example, impeding or even preventing use of the product. Because of these various and necessary considerations, business has understood that only through a combination of different technological measures, can products be protected, and counterfeiters be defeated.

There are basically four different types of technological measures by which businesses attempt to protect their products and enforce their intellectual property and other rights: optical technology, biotechnology, chemical technology, and electronic technology. A brief description of the optical and electronic measures is given below.

Optical technological measures, which are visual in nature and make use of light in various ways, have become quite popular with manufacturers. The most prevalent of those technologies is the hologram, a two or three-dimensional device which reflects an image, or images, and which is sometimes accompanied by movement reflected in the image(s). The main reason holograms have become the most used optical technology is that they are the most difficult, costly, and technically challenging to copy.

Electronic measures include the following: (1) The magnetic strip – like the ones protecting credit and bank cards, they store large amounts of information in coded form, which can be read with an appropriate scanner. (2) The smart card – a plastic card which incorporates a computer chip which stores and, upon proper access, gives large amounts of information. This is expensive but effective and will surely be one avenue for future enforcement. (3) Electronic encryption, which scrambles the electronic signal, making it unreadable by normal means such as computers, CD players, VCRs, and DVD players. The makers of the goods and legitimate purchasers are the only ones who legitimately have possession of the key necessary to unlock the encryption.⁴⁴

ORGANIZATIONS AND INITIATIVES

The issue of the enforcement of IPRs cuts across many segments and layers of society; it affects them all in varying degrees and in different ways. Counterfeiting and piracy constitute the bulk of the problem. Because of the various effects on society, there are numerous organizations involved in this issue, and several noteworthy initiatives. They include the World Customs Organization (WCO)⁴⁵ and INTERPOL.⁴⁶

Nongovernmental organizations (NGOs) are most often industry or trade associations formed to further the goals and objectives of a particular industry. They serve important and vital functions, including conducting research and gathering statistics, formulating policy, voicing that policy at meetings and in relevant fora, and keeping their members informed and up to date on developments with cutting edge information. They include the International Chamber of Commerce (ICC), International Federation of the Phonographic Industry (IFPI), the Motion Picture Association (MPA), Business Software Alliance (BSA), and the International Anti-Counterfeiting Coalition (IACC).

INITIATIVES FOR INTERNATIONAL COOPERATION

Several international initiatives are currently in operation. The EC has been quite active in the fight against counterfeiting and piracy, and its efforts are noteworthy. There are several specific reasons underlying these efforts, such as the comprehensive aim of enhancing the Single Market in its performance and global standing; the introduction of the Euro single currency and the positive effects that can bring; and the fact that many of the categories of counterfeit items are either in large part produced or sold in the EC, for instance, high fashion and luxury goods, and optical disks embodying music, computer software, and films.

In 1986, the EC took action against counterfeit goods by enacting Regulation 3842/86. That regulation was amended in large part by Regulation 3295/94, which was itself amended by Regulation 241/1999. The Regulation seeks "to halt the relentless growth in international trade in counterfeit goods;" it lays down measures to prohibit release for free circulation, export, re-export or entry of counterfeit and pirated goods; it strengthens the powers of the customs authorities; and it deals with the thorny issue of parallel imports without the right holder's consent.

In 1998, the EC prepared and released for comments its green paper, *Combating Counterfeiting and Piracy in the Single Market*. This extensive paper examined the problems associated with counterfeiting and piracy, starting with the widest possible common sense approach; the scope of the paper covers "all products, processes and services which are the subject-matter or result of infringement of an intellectual property right... of a copyright or neighboring right... or of the *sui generis* right of the maker of a database." The EC subsequently published a report on the responses received to the green paper, a document rich in comments, and information, which will serve to justify concerted, focused efforts to deal with these problems.⁴⁷

TOWARDS THE CREATION OF AN INTELLECTUAL PROPERTY CULTURE

Among several factors explaining the declining rate of piracy are the following:

- software companies have established more of a global as well as local presence thus making it easier to purchase the legal item, and there is greater public awareness about the illegalities of pirate software;
- increased cooperation between industry and government in the period since 1994;
- criminal penalties have been enacted in many jurisdictions and enforced in some instances.⁴⁸

Whether, and to what extent, society realizes the full value of IPRs in the new economy and in modern society irrefutably impacts on economic, social, and cultural development. In addition to political will and the implementation of national legislation compliant with all the relevant treaties of IPR enforcement, government leaders may wish to consider the importance of fostering an IP culture (see Box - 9.9).

Appreciating the value of IPRs and the potential positive impact they can have on society, will raise awareness in all persons involved or touched by the process. In the IP culture, government officials and agencies act to increase value and raise standards of living by advocating an increased use of IPRs. The private sector, from multinational corporations down to SMEs, recognizes the value of IPRs in knowledge-based industries and economies. The public understands the benefits of purchasing legitimate goods and services, thereby boosting local industries and economies, increasing the tax base, and teaching children the value of the rule of law. The absence of an IP culture gives rise to a stagnant, receding economy, a lack of creativity and inventiveness, and a business climate bereft of FDI, consistency, or reliability.

An IP culture creates an environment in which the need to actually enforce IPRs is reduced or eliminated, an environment in which the focus is creativity and inventiveness; perfection of products and services; building and increasing market share, consumer confidence, and brand equity; and the proliferation of goods and services to all citizens.

BOX-9.9 INTELLECTUAL PROPERTY POLICIES OF SINGAPORE

Singapore recognizes the importance of intellectual property as a national resource and in attracting foreign investment in its development as a knowledge-based economy. To develop intellectual property as a strategic and competitive resource, the country adopts an essentially pro-active IPR policy for the development of high value-added and creative-content industries. In November 2000, the Ministry of Law announced that the Intellectual Property Office of Singapore (IPOS) would be converted into an autonomous statutory board charged, *inter alia*, with administering the IP system in Singapore. One of the recent IPOS initiatives is the provision of IP information via the recently launched SurfIP (<http://www.surfip.com>), a one-stop IP portal for searches across multiple patent databases in various jurisdictions as well as the provision of other technical and business resources.

On the IPR enforcement front, the agency primarily responsible for domestic enforcement is the Intellectual Property Rights Branch, a specialized Crime Division of the Criminal Investigation Department, while border enforcement is assured by the Customs and Excise Department. In the field of education, Singapore has public education campaigns led by IPOS and the National Science & Technology Board aimed at promoting greater public awareness of IP rights.

Source: Dr. Ng Siew Kuan, National University of Singapore.

For true economic, social, and cultural development to occur, intellectual property must play a crucial role; for IPRs to play that crucial role, they must be enforced throughout society. To effect the maximum enforcement of IPRs, an IP culture must be harnessed. Enforcement is a multi-layered concept. It cannot be approached only through the police, customs, and courts. Without political will, the appropriate legislative framework, and an IP culture, there can be no enforcement, and ultimately, the country and its economy will suffer.

- 1 The terms "counterfeiting" and "piracy" are defined and used differently in different contexts. Generally speaking, "counterfeiting" is associated with the intentional infringement of trademarks, and "piracy" with the intentional infringement of copyright and related rights. However, each of these terms can be defined to include other types of IP. Regardless of these variations in definition and usage, it is fair to say that counterfeiting and piracy involve an indisputable taking of the intellectual property of another without authorization. It is this clear disregard for the rights of others that makes them egregious.
- 2 <http://www.bsa.org>
- 3 Business Software Alliance and Software & Information Industry Association, 1999 **Global Software Piracy Report** (May 2000): 2.
- 4 United Nations Association Staff, *Basic Facts About the United Nations* (New York: United Nations Publications, 1998).
- 5 International Federation of the Phonographic Industry, **Music Piracy Report 2000**, (London, June 2000): 2.
- 6 *Ibid.*
- 7 <http://www.mpaa.org>
- 8 Organisation for Economic Co-operation and Development, **Economic Impact of Counterfeiting**, (Paris, 1998): 12.
- 9 *Ibid.*, 13.
- 10 *Ibid.*, 14.
- 11 *Ibid.*, 15.
- 12 *Ibid.*, 16.
- 13 *Ibid.*, 16.
- 14 *Ibid.*, 17.
- 15 *Ibid.*, 18.
- 16 *Ibid.*, 18.
- 17 *Ibid.*, 9.
- 18 *Ibid.*, 27.

- 19 See for example, <http://www.cybercrime.gov>. Some examples follow. A raid in Los Angeles, California, netted US\$10.5 million in counterfeit software and holograms, and included guns, TNT, and plastic explosives. A member of the BTK gang, convicted for murder in New York, testified that extortion and murder were sales tools used to sell the gang's counterfeit Rolex and Cartier watches; and that the gang earned up to US\$13 million from its counterfeiting activities, which it used to fund its other operations. A raid in New Jersey seized US\$400,000 of counterfeit Louis Vuitton and Chanel handbags, which were found to contain heroin stitched inside. Paramilitary groups in Northern Ireland funded their operations through the sale of counterfeit items, including: perfumes, veterinary products, video films, video games, software, and pharmaceuticals. (See <http://www.iacc.org>).
- 20 The WHO defines counterfeit medicine as "one which is deliberately and fraudulently mislabeled with respect to identity and/or source. Counterfeiting can apply to both branded and generic products and may include products with the correct ingredients, wrong ingredients, without active ingredients, with insufficient quantity or active ingredients, or with fake packaging."
- 21 <http://www.interpol.int>
- 22 *Ibid.*
- 23 <http://www.iacc.org>
- 24 *Ibid.*
- 25 <http://proquest.umi.com>
- 26 WIPO document, WIPO/IPR/KUL/00/3: 4.
- 27 IP Asia (February 2000): 4.
- 28 WIPO document, WIPO/IP/HKG/98/4(c): 2.
- 29 <http://www.cptech.org>

- 30 IPRs are territorial in nature. National protection is extended to foreigners or enhanced according to various international treaties and conventions. But certain rules and customs dictate just how those national rights will be enforced in a foreign jurisdiction. One important rule affecting such rights is the first sale doctrine, which states that when an object or item embodying IPRs is legally manufactured and sold, the right holder's ability to control the disposition of that item is terminated. This concept is also embodied in the exhaustion of rights rule, which can vary as to its national, regional or international scope. When you legitimately buy a book or a car or a camera, you can re-sell it, rent it, or lease it, without a problem in the country in which you purchased it.
- 31 <http://malaysia.cnet.com>
- 32 <http://proquest.umi.com>
- 33 *Ibid.*
- 34 Source: Singapore Police Force, Films and Publication Depot., and Customs and Excise Department, February 1, 2001.
- 35 <http://proquest.umi.com>
- 36 *IP Asia*, February 2000, 10.
- 37 WIPO document WIPO/USPTO/IP/CEI/00/5(A), September 2000.
- 38 TRIPS Agreement, Articles 41 to 50.
- 39 <http://www.cnn.com/business/currencies>
- 40 <http://www.ladas.com>
- 41 <http://proquest.umi.com>

- 42 *WIPO organized a World Forum on Private International Law and Intellectual Property in January 2001 to discuss a number of outstanding questions including the international jurisdiction of IP cases, choice of applicable IP laws, and the recognition of foreign decisions on IP infringement. Discussion papers are available at <http://www.wipo.int>.*
- 43 *Economic Impact of Counterfeiting; 32.*
- 44 *Ibid., 34.*
- 45 *The WCO is based in Brussels, Belgium. Established in 1952 as the Customs Cooperation Council, it changed its name in 1994 to World Customs Organization to reflect its worldwide role as the exclusive intergovernmental organization with competence in customs matters. As this is written, there are 151 member governments. WCO hosts a joint Customs/Business IPR Committee, in which business members work directly with governments to enhance enforcement of IPRs and the fight against counterfeiting and piracy.*
- 46 *Interpol was set up to globally enhance and facilitate cross-border criminal police co-operation. It is an international organization with 179 member countries. See more at www.interpol.int.*
- 47 *<http://www.europa.eu.int>*
- 48 *1999 Global Software Piracy Report, 1-2. See <http://www.bsa.org>.*

CHAPTER 10

THE ROLE OF WIPO

EMPOWERMENT OF THE INDIVIDUAL

The knowledge-based economy has as its foundation the intellectual capital of the individual. This provides it with creativity and innovation, which results in surging growth and dynamic development.

The digital revolution, the Internet, and e-commerce, all global phenomena, serve to reinforce the role of individuals in creating a knowledge-based economy. They provide the means to globally link like-minded persons, to establish the synergies necessary to create true forward movement, and to support and facilitate the sharing of common goals and the tools necessary to achieve these goals. E-commerce is also impressive in its exponential growth and its potential to facilitate distribution of a tremendous array of products and services.

In the era of the Internet, e-commerce, and rapidly evolving digital technology, what is it that empowers the individual? Creativity and innovation play a key role. Intellectual property provides clearly perceived incentives to foster and to actualize creativity and innovation. There is also measurable value in establishing a tangible connection between the products and services created, and the demonstrable ability to derive compensation when these products or services are embraced by the public. These and other factors have been shown time and time again to motivate creators and innovators, businesses and enterprises, at all levels of society, to produce the tangible and intangible works and inventions which so enrich our economic, cultural, and social lives.

There is an underside to this scenario, which is also well documented, and unfortunately much too familiar: How many countries or places are there with an inadequate intellectual property infrastructure, where the creators and innovators know with certainty that their creations and inventions will be stolen from them, and that they will receive no compensation, and no due credit? Such places will have little, if any, success in establishing or attracting new industries, R&D, technology transfers, manufacturing, and FDI into their economies.

INTELLECTUAL PROPERTY EMPOWERMENT

An efficient, energetic IP system creates and fosters national economic, social, and cultural growth. It can stimulate investment, R&D and related activities in the creation and dissemination of new products and services, and, most importantly, there is a proliferation of newly created knowledge, which, in turn, further empowers the individual in society, as well as society in general. The result is a cycle of sharing and exploiting of new and useful knowledge, which ultimately benefits everyone in society. This is the promise of IP empowerment.

Through its programs, budget allocation, activities, and its expressed objectives, WIPO supports the model of an IP system that empowers individuals and societies. This is, quite simply, IP empowerment as an actualized model, and it is and will be the basis for the WIPO strategy over the next years.

One of the primary objectives of WIPO in the implementation of its IP empowerment strategy will be to establish a global community consisting of individuals, governments, businesses, and other relevant constituencies, all of whom will be making active use of intellectual property and the supporting IP systems, as powerful tools facilitating the growth, development, and enhancement of knowledge-based economies. By spreading an IP culture and creating a global intellectual property-minded community the Organization can contribute to the social, economic and cultural well-being of nations.

THE COMPONENTS OF THE INTELLECTUAL PROPERTY-EMPOWERED SOCIETY

Political will, a legislative framework, vital institutions, and an IP culture can be considered essential components of the IP-empowered society. In order to manifest and realize the full value which it has been demonstrated that intellectual property brings to society, there must be an environment in which these components are present and fully functional. The absence of any one of them gives rise to a stagnant and receding economy; a lack of creativity and innovation; and a business climate lacking in vitality, consistency, or reliability. Let us examine these components individually:

- (1) **Political Will.** Government leaders of WIPO Member States recognize the value of intellectual property and the IP system; the need for legislation compliant with all international obligations; the necessity for vital institutions such as IPOs, courts, cultural and research institutions; and the high value to be placed on an IP culture, in which all members of the public are fully aware of the positive impact which IPRs can bring to bear on economic, cultural, and social development, domestic and foreign trade, international investment, and technology transfer. It is the first component in the foundation of the IP-empowered society and it is essential that leaders show their commitment to the vision of IP as a tool for improving the lives of their peoples.

- (2) **Legislative Framework.** While the necessity for political will cannot be underestimated, IPRs are based on a country's national legislation. That legislation must be compliant with the obligations contained in the international IP treaties and conventions, particularly the Paris and Berne Conventions, and the TRIPS Agreement. Whenever the international IP community agrees by consensus that new international norms are required (such as through a diplomatic conference), the national legislative framework can be upgraded, so that newly adopted international norms, such as in the PLT, and the WCT and WPPT, are woven into the legislative framework quickly and efficiently. It is also important that the legislative framework reflects a fair balance among all

sectors, including the public, the private sector and industry, consumers, and government. The key role of this component, the legislative framework, underscores that the rule of law is one of the most important underpinnings of the IP-empowered society.

- (3) **Vital Institutions.** IPRs intersect with society through the institutions that deal with them. Such institutions include government (IPOs and other relevant regulatory agencies such as those dealing with health and safety, taxation, consumer affairs, and foreign affairs); courts (including judges and lawyers); educational and research institutions and enforcement agencies. Institutions must be sensitive to the value of IPRs, must not create barriers to growth or trade, and must encourage creativity and innovation literally through all of the action and decisions which they take or implement. An exceptionally important dimension of these vital institutions is human resources and their development and enhancement. No institution can function without good people doing their jobs well. A scenario in which human resources are not properly supported will not function optimally.
- (4) **IP Culture.** This component is last, not because it is the least important, but because it follows the other components in chronological and developmental evolution. In an IP culture governments and agencies seek to increase value and raise standards of living, by advocating an increased use of IP as a tool for economic growth. The private sector, from multinational corporations to SMEs and sole-proprietorships, recognizes the value of IP in knowledge-based industries. Research in science and technology and cultural institutions are valued and funded. IT and communications technology are emphasized and employed effectively. The many and varied sectors of the IP culture communicate with each other, trade with each other, and act with both the incentives and benefits of the IP system in mind. The general public understands the benefits of purchasing legitimate goods and services and thereby boosts local industries and economies.

As was mentioned above, the absence of any one of these components can cripple the entire system and thereby seriously affect the economy. It is the web of these multi-level, essential components that serves to create the environment in which creativity and innovation are encouraged and stimulated; in which a steady stream of newly created and distributed products and services makes daily life more pleasant, efficient, and exciting; and in which businesses are focused on product creation and development, establishing brand equity and market share, solving problems, helping to eradicate disease and sickness, expanding educational possibilities, and in general, raising the standards of living for every person in society. That is the IP-empowered society.

WORLD INTELLECTUAL PROPERTY ORGANIZATION

What, then, is the role of WIPO with respect to the IP-empowered society? The Organization is constantly seeking to assist its Member States, with respect to each of the above-mentioned four components, by providing training, seminars, and legal and technical assistance. Training and seminars targeted at government officials, legislators, IPO staff members, the judiciary and lawyers, enforcement officials, IP practitioners, creators and innovators and others, are constantly being organized and presented by WIPO in conjunction with the governments of its Member States. By dealing with the components which comprise the seamless environment in which IPRs play such a large role, WIPO, and the work that it undertakes, serves to enhance economic, social, and cultural development; to raise the standard of living for all levels of society; to create new and rewarding opportunities for the public and private sectors; and to help nations to compete in the global marketplace. In general, the role of WIPO is to make the world a better place by striving to accomplish this in accordance with the WIPO mandate.

Towards these goals and objectives, WIPO will further develop new and powerful tools to supplement national systems in the acquisition, maintenance, protection, and enforcement of IPRs. A legal infrastructure must constantly be updated and revised to keep pace with legal, technological, and market advances. WIPO will strive for simplification and improvement of procedures, harmonizing substantive provisions of national laws

towards the establishment of a user-friendly IP system, by making use of the present global protection systems, such as the PCT and the Madrid system, more appealing, less complex and less costly for creators, and more efficient through the application of state-of-the-art information technologies within the Organization.

WIPO will bring forward-looking, problem-solving thinking to bear on its activities and services. As an example, conventional approaches, which have proven in the past to be effective, whether at national or global level, sometimes are not effective in the context of recent questions involving activities in cyberspace, mainly because of the Internet's globality, anonymity, and technical sophistication. WIPO leadership in the area of IP-related questions and problems regarding e-commerce and the Internet will continue to be expanded and reinforced. In this regard, the entry into force of WIPO's "Internet Treaties" (the WCT and WPPT) in 2002 is a good example of its approach to emerging questions for which conventional approaches are somewhat ineffective. Another example is the on-line procedures made available by the WIPO Arbitration and Mediation Center for the quick and cost-efficient resolution of disputes relating to Internet domain names.

The on-going training and upgrading of skills of people integrally involved in vital institutions is crucial if the IP infrastructure is to work efficiently and successfully. These include government officials, experts and professionals, and users of IP systems. This human resource development function with respect to IP is central to WIPO's mandate.

The role of WIPO in the 21st century will be greatly enhanced through its current programs to upgrade and expand its use and deployment of IT. Of particular note are initiatives for the electronic filing of applications under the PCT and for the deployment of WIPONET to assist Member States' IPOs to offer efficient products and services. WIPO will be a leader in both its use and advocacy of IT, encouraging its Member States and other constituencies in this regard and assisting them to the maximum extent possible.

WIPO will allocate and focus its resources, services, and personnel towards enhancing the proven and measurable benefits which the IP sys-

tem creates in respect of economic, social, and cultural growth and development. It will strive to be transparent and accountable to all of its constituencies, most of all to its Member States, and will concentrate its efforts, time, and energy on successfully achieving these goals and objectives. For these goals and objectives are not just worthy – they are crucial to the success and well-being of the generations that will follow.

ABBREVIATIONS

ACDAM	Agencia Cubana de Derecho de Autor Musical
ACUM	Société des auteurs, compositeurs et éditeurs de musique en Israel
ADR	alternative dispute resolution
AICRPE	All India Coordinated Research Project on Ethnobiology
AIDS	acquired immune deficiency syndrome
APRA	Australasian Performing Right Association
ARIPO	African Regional Industrial Property Organization
ASCAP	American Society of Composers, Authors and Publishers
ASP	application service providers
ATSIC	Aboriginal and Torres Strait Islander Commission
AUTM	Association of University Technology Managers
BMI	Broadcast Music Inc.
BSA	Business Software Alliance
BTG	British Technology Group
ccTLD	country code top-level domain names
CD	compact disc
CERN	European Organization for Nuclear Research
CIPR	Coalition for Intellectual Property Rights
CISAC	International Confederation of Societies of Authors and Composers
COMPASS	Composers & Authors Society of Singapore Ltd
COTT	Copyright Organisation of Trinidad and Tobago Ltd.
CSIR	Council for Scientific and Industrial Research (India)
DFG	Deutsche Forschungsgemeinschaft
DNA	DeoxyriboNucleic Acid
DRF	Dr. Reddy's Research Foundation
DSL	digital line subscriber
DVD	digital versatile disc
EAU	Easti Autorite Uhing
EC	European Commission
EER	earnings expenditure ratio
EPC	European Patent Convention
EPO	European Patent Office
FDI	foreign direct investment
GAPP	Generally Accepted Accounting Principles
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product

GEMA	Gesellschaft für Musikalische Aufführungs-und Mechanische Vervielfältigungsrechte
GNP	gross national product
gTLD	generic top-level domain names
HP	Hewlett Packard Inc.
IAC	Industry Advisory Commission
IACC	International Anti-Counterfeiting Coalition
IAS	international accounting standards
IASC	International Accounting Standards Committee
ICANN	Internet Corporation for Assigned Names and Numbers
ICC	International Chamber of Commerce
IFPI	International Federation of the Phonographic Industry
IP	intellectual property
IPMD	intellectual property management division
IPO	intellectual property office
IPR	intellectual property rights
IPRS	Indian Performing Rights Society
ISMH	Indian Systems of Medicine and Homeopathy
IT	information technology
JASRAC	Japanese Society for Rights of Authors, Composers and Publishers
JPO	Japanese Patent Office
KCI	Yayasan Karya Cipta Indonesia
KIPO	Korean Intellectual Property Office
LDCs	least developed countries
M&As	mergers and acquisitions
MFN	most favored nation
MPA	Motion Picture Association
MPG	Max-Planck-Institute
MRI	magnetic resonance imaging
NATO	North Atlantic Treaty Organization
NGO	non-governmental organization
NMPA	National Music Publishers' Association
NRDC	National Research Development Corporation
OAPI	Organisation Africaine de la propriété intellectuelle/African Intellectual Property Organization
OD	organizational development
OECD	Organisation for Economic Co-operation and Development

OHIM	Office for Harmonization in the Internal Market
OTL	office of technology licensing
PC	personal computer
PCT	Patent Cooperation Treaty
PLT	Patent Law Treaty
PPP	pro-active patent policies
R&D	research and development
REACT	Réseau Européen Anti-Contrefaçon
RIAA	Recording Industry Association of America
ROM	read-only memory
SACEM	Société des auteurs, compositeurs et éditeurs de musique
SAMRO	South African Music Rights Organisation
SESAC	The Society of European Stage Authors and Composers
SIIA	Software & Information Industry Association
SMEs	small and medium-sized enterprises
SMI	Secure Digital Music Initiative
TBGRI	Tropical Botanical Garden Research Institute
TK	traditional knowledge
TKDL	traditional knowledge digital library
TKRC	Traditional Knowledge Research Classification
TLOs	technology licensing offices
TM	trademark
TRIPS	trade-related aspects of intellectual property rights
UAW	United Auto Workers
UDRP	uniform dispute resolution policy
UK	United Kingdom of Great Britain and Northern Ireland
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICE	Union of Industrial and Employers' Confederations of Europe
UPOV	International Convention for the Protection of New Varieties of Plants
US	United States of America
USPTO	United States Patent and Trademark Office
VCR	video cassette recorder

WCO	World Customs Organization
WCT	WIPO Copyright Treaty
WE	Western Electric
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WPPT	WIPO Performances and Phonograms Treaty
WTO	World Trade Organization
ZIMRA	Zimbabwe Music Rights Association

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The contents of this publication are designed to offer food for thought for the interested reader. They are not intended to be definitive or all-inclusive but, rather, to provide a basis for further reflection and discussion.

"Intellectual Property – A Power Tool for Economic Growth" could be said to be a work-in-progress and does not necessarily reflect the views and positions of the World Intellectual Property Organization (WIPO).

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This book is designed to be a practical guide to the use of intellectual property as a “power tool” for economic growth and wealth creation.

Its aim is to give the interested non-specialist an understanding of how intellectual property, such as patents, trademarks and copyright have become increasingly valuable assets that can be used in many creative ways to increase material, social and cultural well-being.

It tells the story of how the information technology revolution, and the increasing pace, impact and importance of invention and innovation linked to rapid globalization have brought intellectual property into the limelight, making it a key element in government policy-making and corporate strategic planning.

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