Intellectual Property as a Tool for Development in the Knowledge — based Economy*

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Paper stresses the needs for deriving the socio-economic benefits from effective use of the intellectual property system through enhancement of qualitative competitiveness in trade, commerce and industry. For making the business and industrial productivity competitive, we need the latest technologies which just cannot be got without ensuring strong intellectual property protection. Constant updation of intellectual property legislations, pro-actively modernized infrastructure, and greater awareness building regarding the role of intellectual property in technological and economic development are some of the other topics discussed in it. Finally, it recommends the inclusion of intellectual property rights and their protection in the national economic agenda of the developing countries, forming an integral part of their economic, S&T, and educational policies.

The author has been stressing through the years, in his addresses to individual and groups of developing countries in Asia, Africa, the Arab countries and Latin America, as also to industry representatives associations, that there are considerable socio-economic benefits to be derived from effective use of the intellectual property system through enhancement of qualitative competitiveness in trade, commerce and industry.

A very much more widespread awareness and knowledge of its value for the private sector, as also for national development and growth in the forthcoming millennium, has to be encouraged. Also, as to how the intellectual property system can be utilized to

promote national inventiveness and creativity.

Much has also still to be done in updating intellectual property legislations to keep in step with creative new technologies, in modernizing of intellectual property infrastructures and administrations, and in collecting and computerizing patent documentation and its availability to industry. Government infrastructures concerned need also to be made more market and user oriented in order to serve the needs of a large and growing market of users.

The socio-economic benefits of protection of works of the mind are not yet a fully tapped potential in a number of our countries. There needs also to be a broad basing of the awareness of the considerable relevance of effective intellectual property rights (IPRs) protection in safeguarding the results of technological development as well as promoting national creative endeavor.

**Strengthening of the Intellectual Property System in the Context of Internationalization of Trade, Emerging Technologies in the Digital Era; Internet Economics; the Multimedia Age; Information Technology and Electronic Commerce in the 21st Century Information Society**

Intellectual property rights are being increasingly recognized the world over as an important asset in the process of technological progress and competitive capability. They are key components of the infrastructure required for socio-economic growth, for developing indigenous technological capacity, for generating export opportunities through enhancement of enterprise competitiveness and helping attract foreign investment.

Technology development which in large measure is dependent on strong intellectual property protection, has created new ways in which products of creative activity can be made available to the public.

The skills to link the new technologies into multi-facility networks, including through the advent of interactive digital technology, digital networks, digital superhighways and the Worldwide Web of Internet that has millions of users connected, are equally important.

The emergence of new and sophisticated technologies has also led to making piracy and counterfeiting, which basically are a theft, easier. This has to be sternly checked through strong penal provisions in our legislation and through providing, as in some countries, special anti-piracy squads in the police establishment as well as through an enlightened judiciary that would pronounce prompt and maximum sentences under the law.

The 21st Century is labelled as the age of information, the multimedia age, the network age or the digital age. The circulation of an enormous amount of information in itself is creating a number of problems.

It is frequently said that modern society is about to change into an “information society”. While what this means is not always clear, it seems obvious that the main traditional economic sectors in society namely agriculture and industry, will be supplemented by a third sector, predominantly based on collection, organization, distribution and exploitation of “information”.

The so-called information society and the future Global Information Infrastructure (GII) will reach far into our daily lives and will provide access to all kinds of expressions of human ingenuity and creativity. It
will need significant investments in the necessary hardware including communication lines, satellite connection, fibre optic cables and acquiring of computer processing and storage capacity. While there is no need to underestimate such investments, one needs also to be aware of the even bigger investments that are required in order to provide the contents, namely the information.

The provision of the contents is not without its costs. The investments necessary to create databases, computer programs, audio-visual production, are huge, and like other investments, they are only possible, if there are suitable legal provisions, which enable recovery of investment and leave also a reasonable margin of profit.

The extensive use of computers, the Internet and the Worldwide Web, with electronic commerce that we know of today, are only glimpses of what can be expected in the ensuing century, when technological development, information technology and improved transmission systems, will enable digitized transmission in real time, much faster to the ordinary consumer. These are not, as some call them, just buzz words, but those with which we shall soon have to be fully prepared to cope with in the knowledge-based society of the 21st century.

The increasing internationalization of the world economy and of corporate activities is fast eroding physical barriers to international transactions. The growing borderlessness of trade and technology is throwing up for us in developing countries, both new challenges and new opportunities. Knowledge-based technology is fast becoming an important asset in trade and investment.

The promotion of inventions and innovations is the basis of, and fundamental to, the success of our enterprises, be they large, medium or small. The promotion of national inventive activity will also be the bedrock on which the foundations of national industrial and economic progress and development must rest, and to promote this, adequate protection of IPRs is a basic precondition.

Removal of barriers and opening up of economies in developing countries had already resulted in an unprecedented flow of funds and investments. Around 425 billion dollars worth of new factories, supplies and equipments had come to developing countries between 1988 and 1995. In 1995 alone, the flow of private capital into third world countries totalled US$170 billion - a 200% increase over 1990. World trade is also increasingly becoming an important factor in the growth process. In fact, world merchandise trade exports grew by 9% in 1994, for example, and was the highest annual increase since 1976.

To come back to our theme of intellectual property, as a tool for development, encouragement to, and facilities for, our scientists, researchers and technocrats to invent, combined with the innovative spirit of our industrial enterprises and business, is a priority need for us to generate higher growth through greater exports.

Our businesses and enterprises should be encouraged to consciously promote among their employees, the inventive, innovative and creative spirit. Not only this, but it is also essential to help inventors to commercialize their inventions.

Industry/R&D institutions and university research linkages should be encouraged and strengthened. Industry, especially the pharmaceutical industry, should plough much greater funding in R&D.

It might be interesting for you to organize in your countries for the industry association
with the assistance of some of the R&D institutions and the corporate sector, to undertake a study: (a) regarding the percentage of R&D expenditure spent on invention promotion in the public and private sectors, and (b) the *raison d'être* for a generally low level of national patent applications.

Is this due to lack of encouragement to our scientists, engineers and skilled professionals not only in R&D institutions, in business and in industry, in the SMEs, etc., or is it due to bureaucratic impediments.

Encouragement of invention and innovation promotion will prepare us for the technology leap, so to speak, which with the help of the intellectual property system, will enable us to ensure our much needed accelerated development in the knowledge-based economy in the 21st century and this new millennium.

Our industry, the corporate sector, as well as the SMEs have to use the latest technologies. An advance in technology should result in a commodity with more attractive performance characteristics and a product more saleable for the producer and less costly for the consumer.

**Intellectual Property; Its Management and Role in Enhancing Competitiveness in the Knowledge-based Economy in the Ensuing Millennium**

Economic development is increasingly technology-based, and technology is knowledge-based. The global technology system has changed in the last two decades and knowledge-based technology has advanced considerably. Intellectual property signifies this advancing knowledge in the form of new ideas, new techniques, new processes and new products having economic and commercial potential. Intellectual property rights will increasingly become an important tool for development in the knowledge-based, outward looking society of tomorrow.

An effective intellectual property system could give a boost to joint ventures, to licensing agreements and to technical cooperation facilities. To fully participate in the opportunities ahead, we have to accept the challenge of upgrading our national intellectual property system — both legislative and infrastructure, as referred to earlier, since without this upgradation, no transfer of first grade technology could be expected.

It is important to optimize the utilization of the intellectual property system in technological and economic competition, which latter will become, for us, more intensive in the years ahead.

The economic achievements of many of our developing countries are already not based only on tin, rubber or timber. Economic progress is technology based.

Strong intellectual property protection with adequate and modernized intellectual property legislation plus its effective enforcement undoubtedly helps in the transfer of new and emerging technologies, as it assures licensors that their technology will not be exposed or revealed to competitors.

Attracting such resources in a world of hyper competition will be more difficult, if IPR protection is not strong or is ineffective. As one of our eminent scientists and one of the acclaimed leaders in the pharmaceutical industry remarked, “a strong patent regime could constitute a landmark; a landmark that could lead to the reversal of ideas and products flowing from overseas.”

Good management requires, in our enterprises, industries and R&D institutions that our young technocrats and scientists should be encouraged to invent and innovate, so that we produce our own brands of technol-
ogy in which we may have both the competence and the price edge.

Innovation is expensive. IPR protection provides that the expense is not in vain. The public also gains as the invention becomes public knowledge through publication of patent documents. The patent system, with its wealth of technological information disclosed through patent documents, is an important resource for technology development, as also a significant factor in economic growth.

Considering that 1.65 million inventions are documented and disclosed through patent documents each year worldwide, it is obvious that the industrial property documents are an excellent source of the state-of-the-art in most technological fields, and the inventions so disclosed constitute the largest source of available technological and commercial information which is an invaluable input in the development of creative new technologies. Our R&D efforts have to take cognizance of this vast amount of intellectual wealth. Our R&D planning must use this wealth increasingly and systematically in the growth process during the ensuing century.

It is important to re-emphasize that the technology disclosed through patent applications serves to stimulate ideas for further inventions and innovations. It could encourage the efforts of our inventors in coming up with even better inventions or inventing "around" the original. Such indigenous inventions, duly registered, could well surpass the original inventions.

We should really aim, with the help of the intellectual property system, to move from being the importers of technology to becoming its producers and exporters. Each such indigenous invention also has a multiplier effect. It is the basis for further increasing technical developments.

Certainly not all the several million registered patents in the world can be major breakthroughs. A sizeable number encompass just "incremental" inventions consisting of small improvements to products and processes that increase their efficiency and marketability and are built "around" technological information obtained from existing patent documents. Valuable technology is not always "high tech" nor does it always have to come from abroad.

With our skilled, relatively low cost technical manpower, we should be able, with the effective use of the intellectual property system, to increase our competitiveness in the knowledge-based economy in the ensuing millennium.

**Encouragement of Inventive, Innovative and Creative Activity in Business and Industry; Promotion of Innovation Management in Small and Medium Enterprises (SMEs); Links with Institutional and University Research; Transfer of Technology; its Acquisition and Licensing**

Encouragement of inventive activity is essential in as many enterprises as are basic to our respective national economies and for developing our individual national export potential.

As business research advances and with growing investment in R&D the business policy of industry will have increasingly to be concerned with their inventions being protected. In this context, while the bigger industries usually have a fairly high level of knowledge in the area of information concerning the latest inventions, it is the SMEs, which need to be apprised and helped in this area. SMEs are significant employers, and
are also often able to adapt sooner to technical changes. The opportunities for them to make more informed investment decisions could also prime the national technological base.

Enterprises both large as well as medium and small stand to gain a great deal through their employee’s inventive activity and should provide incentives for the employee inventors through monitory awards, promotions, etc.

Again, with the increased use of the intellectual property system, the links between business and university and institutional research need to be strengthened. It is necessary to encourage industry to turn to researchers in these institutions for various consultancy requirements.

We need, in the ensuing millennium, to consciously promote such interaction in the context also of seeking and retaining export markets. Weak internal linkages that inhibit the efficiency of the productive sector will need to be corrected. The intellectual property system could act as a facilitator for the framework of a stimulating relationship between the universities, R&D institutions and industrial enterprises.

International competitiveness can be maintained through high quality production, incorporating the latest technologies, and competitiveness in the world market and growth in trade can further ensure adequate and suitable job and employment opportunities.

Sophisticated research-based innovation, which should aim at using the initial transfer of technology, to originate worthwhile technology nationally, is often stunted by lack of adequate IPR protection, which could and does affect transfer of worthwhile technologies.

Global industrial and trading activity is increasingly drawn towards transborder alliances. Joint ventures, co-production agreements, joint research, technology tie-ups and licensing agreements based on IPR protection are bringing together major firms in both industrialized and developing countries. These cooperative alliances which include licensing or authorizing the use of protected inventions are important aspects of enterprise management of industrial property; it is an effective way of promoting the transfer of technology because the latter is received from the right source and normally with the full assistance of the licensor.

Legislative and Infrastructure Modernization in the Quest of Techno-economic Development and Competitiveness

Our legislations in the intellectual property context, particularly in the increasingly knowledge-based society of tomorrow, cannot and must not remain static, and have to be abreast of rapidly emerging new technologies and international developments. The more recent such development is the acceptance of the WTO’s TRIPS Agreement, which by now has as its members 135 countries of whom about 98 are developing countries.

Legislations cannot and nowhere have been static in such fields where new technologies are constantly emerging and our own economic and technological growth compulsions, as well as our international commitments, require IP laws to be in step with changing times.

Our strategy in the heady days of the TRIPS negotiations concentrated on building an alliance of developing countries that would contain the expansion of the TRIPS Agenda.
Our excellent representatives and negotiators had, finally by December 1993, when the TRIPS Agreement was signed, obtained, through negotiations, quite a few ameliorations and flexibilities in the text, which seemed a good enough starting point and base for building our export trade and well being. It is, therefore, felt, now that there is no fear justified except fear in this context. Also, with some important partners, Brazil for example, having gone steps ahead, there is a growing body of evidence about the ineffectiveness of any other strategy.

Anyway, TRIPS has come to stay and whether at this point of time we like it or not, has very little relevance. We should concentrate on our ingenuity to use its flexibilities to our advantage. Meanwhile, we have to modernize our IP legislations and administration.

Let us adapt to the new sophistications and neither be afraid nor look back. There is no shortage of inventive, innovative or creative spirit amongst our people. The TRIPS Agreement, according to all forward looking thinkers, is an advantage to us, as it will also encourage the inflow of technology into our countries and would be in tune with the policies of economic liberalization in most of our countries. We shall, however, while deciding on the implementation, have to undertake adequate safeguards to protect our interests.

As for modernization of infrastructure in quest of techno-economic development and competitiveness, at the national patent office level, invention and, through it, technological promotion should be an effective policy concern.

Constant automation and computerization of patent and trademarks operations should be a vital component of improving client services and client orientation. Patent and trademark applications would need to be processed much more expeditiously, so that national inventors are encouraged to register their inventions nationally.

The national patent offices or administrations will need to be provided with enhanced resources, accelerated computerization, strengthening of patent information services and upgrading of the levels of management - perhaps also making them independent and autonomous bodies - with part of the funding coming from enhancement of fees for patent and trademarks applications.

Copyright Protection and the Cultural Industry; its Contribution to National Economies

In the field of copyright, creative intellectual activity would need constant encouragement, by according to, and safeguarding for, authors as the creators of literary and artistic works, the exclusive rights in them. Since copyright protection covers mass media communication, printed publications, sound and television broadcasting, films, and in a number of countries extends also to computer programs and computer systems for storage of information, its value and importance in an electronic age is quite considerable.

An updated, modern copyright legislation and its determined enforcement in the face of emerging technologies is an important factor in attracting and sustaining investment in what has come to be known as “the cultural industry”. This industry is growing both in developed as well as in a number of developing countries.

The core of this industry is book publishing, newspapers, advertising, radio and television broadcasting, sound recordings; musical and audiovisual works; films; computer
software and data processing industry. Meanwhile, digital technology and digital superhighways are revolutionizing the concepts of copyright protection.

The cultural industry is estimated to comprise of the total GNP, in Australia 3.1%, Germany 2.9%, Netherlands 4.5%, New Zealand 3.2%, Sweden 3.1% to 6.6%, UK 3.6%, USA 5.8%, to take examples of countries where these estimates have been made.

In the author’s own country, India, according to a recent study of his published by UNESCO in 1996, it worked out to 5.06%.

The cultural industry in a number of developing countries is growing, and is not only contributing to the GNP, but also is one of the largest and fastest growing sectors of the economy. In some developed countries, the rate of growth is over twice, the annual rate of growth of their entire economy. It is also a substantial job provider.

Hence, the necessity to protect it through strict and effective enforcement of the national copyright laws, which should and must provide for stringent penal provisions that need to be strictly imposed.

Effective Enforcement of Intellectual Property Rights

In order to promote creativity, inventiveness and innovation through use of the intellectual property system as an important tool for development in the increasingly knowledge-based society of the future, it is essential not only to constantly update and modernize legislations in order to be in step with new technologies, but to ensure that they are efficiently administered and effectively enforced.

It is important that our legislation provides for stern penal provisions for infringement; also that the judiciary appreciates the need for imposing the maximum punishment under the law in cases of infringement. Without strict enforcement, counterfeiting and piracy could cause irreparable harm to the inventors and innovators, the creators of works and other rights owners, thereby hampering inventiveness and creativity and the growth of export oriented, knowledge-based industries, as well as causing damage to the information technology and software industries.

It is essential to safeguard intellectual property against counterfeiting and piracy. It must be remembered that technology is a double-edged weapon available to infringers as well, and that the ingenuity of commercial pirates is boundless. Pirate editions of new products can come on to the market at almost the same time as the original. Thus, in reality, the lead-time is practically non-existent. Our industry and enterprises need to be helped with stringent enforcement, else the investments could be adversely affected.

Strengthening also of sub-regional or regional cooperation in enforcement and constant exchanges to improve upon it, would be an extremely positive development and should be encouraged.


In order to promote economic growth through knowledge-based technology development with the aid of the IP system, it is essential, imperative and necessary that in respect of IPRs and their protection, the private sector of business and industry needs to be made aware of its techno-economic advantages in their trade promotion.

Awareness building programs need to be held periodically in order to help a progres-
sive new awareness in business, in research and development institutions, in university circles, amongst institutes of management and technology, among technocrats in private industry, among intellectuals, among the police, customs and the judiciary, which play an important role in enforcement. Specialization amongst judges is also a very important element.

Greater information dissemination for awareness building amongst the public is also necessary, and Governments might utilize the media for this, in order to help the mindset in the community at large.

As a corollary, an intellectual property "culture" needs to be assiduously and deliberately promoted which would encourage innovative and inventive activity also in the private sector linked to market needs, encourage scientific and technological creativity, help modernize intellectual property infrastructures and administrations to make them increasingly user-oriented, as well as concentrate on personnel resource development required for the purpose.

The knowledge-based frontiers of intellectual property are being pushed ever increasingly forward with the advancement of science and technology. More and more issues are emerging requiring protection in order to encourage scientific pursuits and investments therein. Some of these are, for example, biotechnology, microorganisms, etc.

The teaching of these new frontiers of intellectual property should be a part of the law faculty curriculum in universities, in institutions of higher learning, in institutes of engineering, management and scientific research.

For all this and much more, there needs to be at the national level, a political will to adopt the intellectual property system for further techno-economic and socio-economic development.

And finally, the author would suggest a determined effort by national governments in developing countries, to help and assist in the setting up of national or sub-regional institutes of intellectual property which should serve both the functions of an awareness building institution, as well as for moot ing policy options and initiatives.

**Conclusion**

Some of the points mentioned in this presentation, which in the developing countries' context, should be the policy considerations and directions, for strengthening and promoting of the use of the IP system by governments and by the private sector, and its utilization as a critical tool in wealth and job creation and in socio-economic and technological development, are:

(i) Since techno-economic growth and development to be meaningful, must reach out to the masses of the people, and should result in job opportunities, and since socio-economic development in today's world is knowledge-based and technology driven, it is essential to make our business and industrial productivity competitive, using in the process, the latest technologies.

We can get technology for the purpose, but to ensure that it is latest and the best, it just cannot be without ensuring strong IPR protection and its effective and efficient administration as well as strict enforcement.

(ii) IP legislations should constantly be updated and refined to keep pace with international developments and emerging technologies.
(iii) In order to help business, industry and enterprises to better utilize the IP system, the infrastructure should be pro-actively modernized and computerized, taking steps to make it also responsive, user-friendly and helpful, with increased efficiency of its procedures and practices in order to encourage investiveness and invention promotion. The intellectual property administrations might be made autonomous and self-financing with suitable increase in fees, if necessary.

(iv) Greater awareness building regarding the role of IP in technological and economic development, should concentrate on creating more positive thinking in this regard, not only in universities and institutions of higher learning, but also in the industrial and enterprise sectors, to correct misconceptions and negative views, due largely to lack of detailed knowledge or precise information.

Governments could help launch a promotional public relations operation to better inform the general public through utilization of the mass media.

(v) Industry/R&D/university and institutional research linkages should be encouraged and strengthened.

(vi) National/sub-regional institutes of intellectual property development should be set up, where they donot exist, for awareness building as also for mooting policy options.

(vii) Finally, IPRs and their protection need to be on our national economic agenda, forming an integral part of our economic policy, our S&T policy and our educational policy.

We should face up to the challenges and rewards in the new millennium by using the IP system in our quest for competitiveness and our own national socio-economic self-interest.