

Patenting innovations: New demands in emerging contexts

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The IPR framework in India has to be changed as per the guidelines set by GATT. With growing demands on research institutions to procure funds for themselves through targeted industry-institutional alliances and marketing their innovations, appreciation of the emerging issues related to IPR by our scientists and technocrats has become relevant. To create and maintain global competitiveness and gear up for the future this article suggests approaches to management of IPR in India.

Intellectual Property Rights in India – A historical perspective

Even though India has a very rich heritage of science and technology since the Vedic period, the social structure including traditional practices and the ethos of the Indian mind did not consider a need to protect acquired knowledge. Innovations and techniques developed were retained within the families and small social groups. This was considered adequate protection of the generated knowledge. Though there were basic formal societal laws which protected civil rights of the people, there were no laws for governance of knowledge. Organized management of science and technology struck roots in India with the British who established a string of institutions to nurture and exploit local resources and talent to enhance and retain their global competitiveness in trade. They also felt the need for a formal system of Intellectual Property Rights in India¹.

The British for the first time introduced the Act of Protection of Inventions based on the British Patent Law of 1852 which was enacted in India in 1856. Certain privileges were granted to the inventor for new methods of manufacture. Since then the Patents Act in India changed with the introduction of Patents and Designs Protection Act 1872. Subsequently, the Protection of Inventions Act was introduced in 1883 which was consolidated as Invention and Designs Act in 1888. On 15 August 1947 The Indian Patents and Designs came under the management of the Controller of Patents and Designs. In 1965 a Patents Bill was introduced in the Parliament. It was significantly amended in 1967. Finally the Patents Act of 1970 together with the rules came into force on 20 April 1972. In 1872 the Designs Act was introduced in India to extend protection to designs

in textiles, linen, cotton, calicos, muslin which included patterns, prints and modeling, casting, embossment of ornaments or articles of manufacture. The Indian Patent and Designs Act 1911 with amendments in 1978 and amended rules in 1985 is currently in force. Legislation for the protection of trademarks was brought into force from 1 June 1942 and was based on principles of the English Common Law. The Act of 1940 was amended to Indian Trade and Merchandise Marks Act 1958 which came into force on 25 November 1959 (ref. 2).

The copyright laws in India meet international standards. However the existing laws related to patents, industrial designs and trademarks are due for changes to comply with the standards of the Trade Related Intellectual Property Rights (TRIPs).

The TRIPs Agreement³, which came into effect on 1 January 1995, is to date the most comprehensive multilateral agreement on intellectual property. India is a signatory to the General Agreement on Trade and Tariffs (GATT) and as a member of the World Trade Organization (WTO) is obliged to meet all the articles of the TRIPs. It also outlines features on minimum standards, procedures and remedies for enforcement, and dispute settlement. Countries which do not yet meet these standards have been given a period of five years to change their laws, extendible for the least developed countries with another five years. India as a member of WTO is obliged to change her patent laws latest by 2004.

The areas of intellectual property covered by TRIPs are:

- Copyright and related rights (i.e. the rights of performers, producers of sound recordings and broadcasting organizations)
- Trademarks including service marks
- Geographical indications including appellations of origin
- Industrial designs

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- Patents
- Protection of new varieties of plants
- Protection the layout-designs of integrated circuits
- Protection of undisclosed information including trade secrets and test data
- Control of anti-competitive practices in Contractual Licenses.

India is yet to legislate on geographical indications, protection of new varieties of plants, layout-designs of integrated circuits; and undisclosed information including trade secrets and test data.

It may be noted that each country has the option to frame its patent laws within the broad framework defined in the WTO agreement. The Indian Patent Act 1970 does not allow product patents in pharmaceuticals, foods and agrochemicals. The meaning of 'non-patentable products' is to be understood as defined by sections 2(1)(I), 3 & 5 of the Indian Patents Act 1970. The key elements recited by these sections are that substances capable of being used as 'food/medicine/drug' and the entire class of materials formed by any chemical reactions do not qualify as patentable subject matter. This feature coupled with the requirements of Section 3(e) that a formulation, however novel, is not patentable if the components act as mere admixtures resulting in aggregation of their properties severely limits the items which qualify as patentable subject matter in India. This is unique to the Indian Patents Act 1970, which expects the components in a formulation to exhibit synergy. It is under such conditions that no 'product patents' are allowed in India⁴.

However till the patent laws are changed as per TRIPs, the developing countries are expected to provide for a pipeline protection 'in the form of a mail box' which would accept patent applications for products relating to Pharmaceutical and Agricultural Chemicals from 1 January 1995. It would also guarantee an exclusive marketing right for five years to the invention which is the subject matter of the said patent application if a patent has been granted and marketing approval has been obtained based on patent application for the same product in another WTO member State after 1 January 1995.

On a complete review of the present act a number of changes may be forthcoming:

- Product patents to be allowed in all fields of technology without exception.
- All patents will have a uniform duration of 20 years.
- In the current patent law, the Government of India has powers to grant compulsory licenses if government feels that the patent has a wide usage in public interest, without consulting the patent holder. In future, compulsory licenses may have to be given only on

merit of each case and the patent holder will have to be given an opportunity to be heard.

- Non-production of the patented item in India and mere importation amounts to non-working of patent in the present act. In the modified form, no discrimination may be made between imported and domestic products on the issue of working of patents.
- In case of infringement of a process patent the burden of proof is on the plaintiff and not the alleged infringer as per the prevailing law. The burden of proof in future will have to shift on the alleged infringer. This in the TRIPs parlance is called 'reversal of burden of proof'.

In a recent dispute at the WTO⁵, the USA alleged that India has failed to meet the basic commitments of TRIPs. The Dispute Settlement Body of WTO made the following observations and recommendations based on the submissions made by USA and India:

- India has not complied with its obligations under Article 70.8(a) and, in the alternative paragraphs 1 and 2 of Article 63 of the TRIPs Agreement, because it has failed to establish a mechanism that adequately preserves novelty and priority in respect of applications for product patents in respect of pharmaceutical and agricultural chemical inventions during the transitional period to which it is entitled under Article 65 of the Agreement, and to publish and notify adequately information about such a mechanism;
- India has not complied with its obligations under Article 70.9 of the TRIPs Agreement, because it has failed to establish a system for the grant of exclusive marketing right.

The Panel recommended to the Dispute Settlement Body to request India to bring its transitional regime for patent protection of pharmaceutical and agricultural chemical products into conformity with its obligations under the TRIPs Agreement.

Further deliberations on this issue have concluded with India being given time till April 1999 to meet these obligations failing which USA could call in appropriate sanctions.

Recently the Government of India has announced that India would become a member of the Paris convention and also join the Patent Cooperation Treaty.

The implication of these is that the government has to act quickly and set up an effective process to draft suitable amendments to the Patents Act. In the meanwhile institutions and industry in India have to strengthen their innovation system and take proactive and organized approach towards IPR management in general and for patents in particular. This will require our academicians and businessmen to debate the critical issues and express their professional views to the committees that have been set up by the government to review the IPR status

in India. The academic community in India has till now remained a silent spectator to the events unfolding in recent times.

The patenting scene

The evolving global patenting scene has a number of lessons for India. These may be analysed to arrive at a set of recommendations and speedy actions in India to meet the demands of the millennium.

Global view

Technology development and its protection in the form of patents and design registrations are getting globalized. Most patenting activity in the world is focused in Europe, USA and Japan⁶. There has been a 74% increase in the total number of filings from 1991 to 1995 amounting to approx. 19% increase per year. The aspect of internationalization of patent activity may be measured by the number of 'corresponding' patent applications that are filed worldwide (i.e. the number of subsequent patent applications that are filed in different countries per first filing in a country). In 1994 the number of first filings were 629,611. For these first filings one year later, i.e. in 1995 there were 2,089,228 subsequent filings in other countries (i.e. 2,774,582 – 685,354 first filings in 1995). Thus there were 3.32 subsequent filings per first filing in 1994 compared to 1.96 in 1991/92 (Figure 1).

One may therefore conclude that the rate of subsequent filings has gradually grown as one is realizing the value-added link between patent rights, technology transfer and trade.

Analysis of the patenting dynamics in the Trilateral Blocs (Japan, Europe, USA) (Figure 2) brings out some interesting trends as

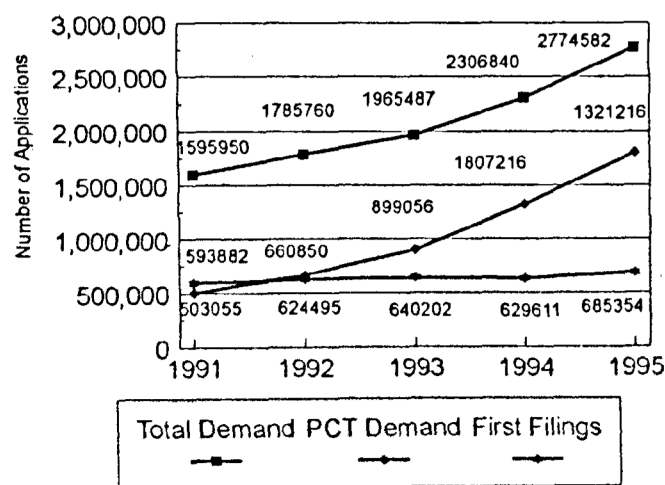


Figure 1. Worldwide demand for patent rights 1991-1995 (Source: WIPO Statistics on Internet).

- Japanese innovations are well protected in Japan. 18-20% of the filings in USA and EPO are Japanese inventions.
- In EPO 50% of the applications are from Europe, 29% from USA, 18% from Japan and 4% from other countries.
- In USPTO 55-58% are from USA, 19-20% from Japan, 15-16% from Europe and 8-9% from other countries.
- EPC file less applications in Japan than Japanese applicants file in Europe.
- Japanese applicants file more applications in the USA than US applicants in Japan.
- The number of applications from USA into Europe is more than the number of applications from Europe to USA.

A further comparison of the proportion of patents filed in each of the patent offices is a measure of the emphasis on innovations given in a region. The WIPO statistics reveal:

- In human necessities the proportion of filings is USPTO (17%), EPO (14%), and JPO (9%).
- In chemistry/metallurgy it is EPO (19%), USPTO (11%), Japan (11%).
- For physics and related fields the proportion is JPO(44%), USPTO (41%), and EPO (34%).

Figure 3 illustrates the proportion of applications in high technology areas such as computer and automated

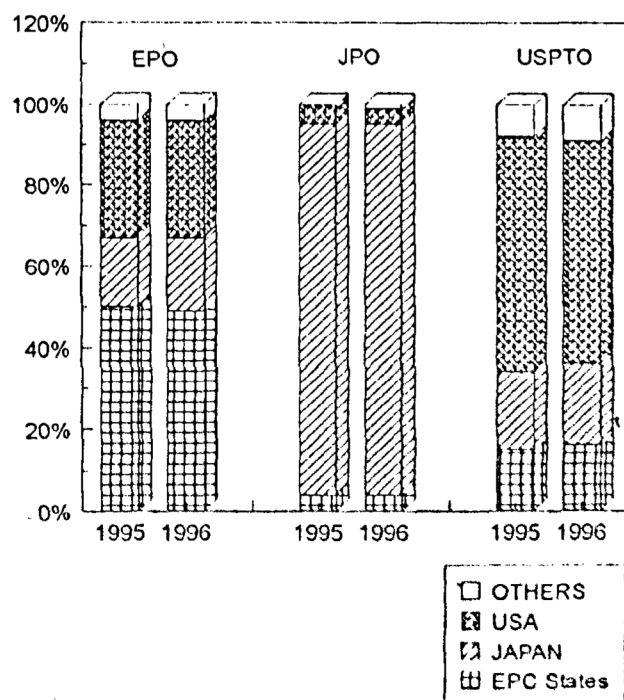


Figure 2. Proposition of applications per country of origin (Source: WIPO Statistics on Internet).

business equipment, micro-organism and genetic engineering, aviation, communications technology, semiconductors, lasers, in 1995 and 1996 per country of origin.

At the EPO, 17.2% of all applications are in high technology fields. It is 13.4% in JPO and 22.5% in USPTO. However at both the patent offices Japanese applicants hold more share in high technology than on average. Share of USA applications in Japan is relatively smaller compared to their applications in Europe.

This feature is well understood when one looks at the leading patentees in USA and their share of business in the niche areas of expertise. There are 8 Japanese companies among the top 11 patentees in USA who are also the business leaders in their high technology areas of expertise.

In the field of human DNA sequence⁷, most patents in the USA have been granted to companies such as Ashai, Takeda, Green Cross, Suntory, Sumitomo of Japan and Genentech, Immunex, Cetus, Eli Lilly of USA. Among the universities and other agencies, the leading names are US Department of Health & Human Services, University of California/Texas, Washington University, Japan Foundation of Cancer Research and Agency of Industrial Science & Technology. Interestingly only two companies in Europe, namely Ciba-Geigy & Roche figure among those leading patentees in human DNA sequence patents.

Table 1 gives leading patentees in the USPTO in 1997. The Japanese domination in emerging areas of

high technology is fairly clear and this strategy will give them a competitive edge in the new millennium.

The Indian scene

The patenting activities in India have been abysmally low compared to that in Europe, Japan, and USA (Figure 4).

With the ongoing steps towards liberalization, the average annual filing⁸ of approximately 3500 patents in India has increased to about 5500 in 1995 (Figure 5). A scan of the patents granted in India to various firms from 1972 to 1994 reinforces the point that major players in the patenting scene in India have been transnational companies such as Hindustan Lever, Hoechst, Johnson & Johnson, Sandoz, CIBA, Colgate Palmolive, Pfizer, Nestle, Lucas. Very few Indian companies such as Bajaj have focused on patenting their innovations on their path to commercialization. It is only recently that leading Indian Drug Companies such as Dr Reddy's Laboratories, Ranbaxy, Lupin Laboratories have started patenting their research findings with the required level of focus and determination. In recent years a number of companies like Nordisk, Eli Lilly, BASF, Englehart, JB Chemicals, Procter & Gamble, Degussa and others have started aggressive filing of patents in India.

Public sector undertakings in spite of their very large R&D facilities and manpower have so far not taken to patenting in any significant way. However Bharat Heavy Electricals Ltd (BHEL) stands out significantly. Defence and space research in India have substantial national spending. Though there have been notable innovations, these institutions have not considered it necessary to patent their work. This is in sharp contrast to the attitude of the corresponding Government Departments in the USA who have proactively patented their innovations and continually reaped commercial benefits from them.

Patenting trends of CSIR from 1983 to 1997 show that the number of patents filed by CSIR laboratories started increasing after 1988-89 and now after 1996. Major institutions involved in intense patenting among others have been NCL, IICT, CDRI, CECRI, NML, etc.

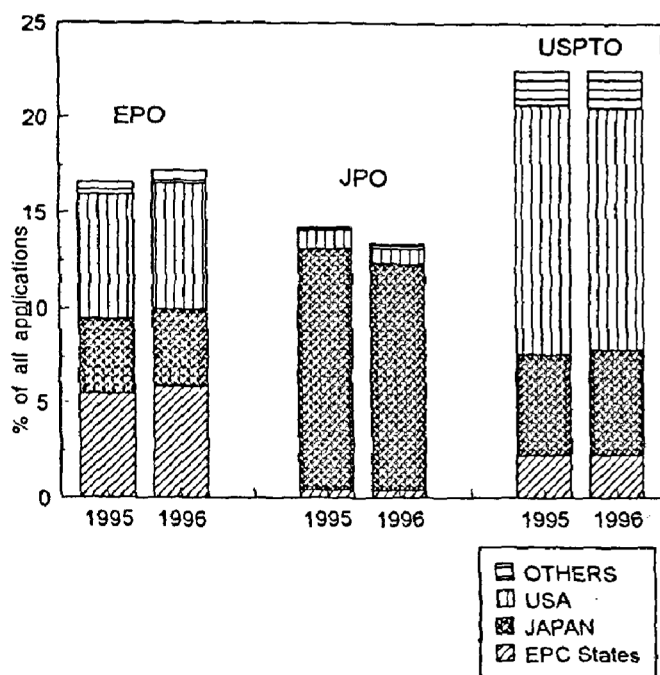


Figure 3. Proportion of applications in high technology areas per country of origin (Source: WIPO Statistics on Internet).

Table 1. Leading patentees⁹ in the USPTO in 1997

Rank	Number of patents	Organization
1	1724	IBM
2	1381	CANON
3	1095	NEC CORPORATION
4	1058	MOTOROLA INC
5	935	US GOVERNMENT
6	903	FUJITSU LTD.
7	903	HITACHI
8	892	MITSUBISHI
9	862	TOSHIBA CORPORATION
10	859	SONY
11	795	EASTMAN KODAK CO.

Major increases have been from CSIR laboratories working in chemicals, materials and pharmaceuticals. The increase coincides with a shift in CSIR policy, which required laboratories to earn a significant portion of their budgets through sponsored research by industries.

Recently, CSIR has also formulated its IPR policy and widely publicized it among the laboratories. These policy changes are inducing the laboratories to create a positive climate to attract industrial sponsorships or even 'sponsored collaborations' so that the process of technology development and transfer is streamlined. A number of Indian and transnational companies have already signed memorandum of understandings with CSIR in such joint activities. As a result, there is a significant rise in the number of patents filed from CSIR laboratories in India and abroad.

The National Research and Development Corporation (NRDC), which is a corporation under the Department of Scientific & Industrial Research (DSIR), has also started helping Indian firms and other institutions to file patents abroad. In 1992-93, they had only 3 foreign filings compared to 40 in 1994-1995. Technology Information and Forecasting Cell (TIFAC) has been involved in a series of patent awareness workshops in the country. It is also extending techno-legal support to institutions to patent their inventions in India and other countries.

Steps to the new millennium

It is imperative that the entire process of patenting and its enforcement, including the possible changes to be introduced in the Indian Patents Act as a part of the harmonization programme needs to be appreciated by businessmen, educationists, scientists, engineers and administrators so that the patent system can be effectively

exploited. This would also bring in the desired effect of building IPR management into productive project working teams.

Management of IPR

Future competitive advantage of research-based institutions will be primarily determined by their ability to create, market and manage value added intellectual assets. Most institutions in India are yet to appreciate the need to formalize a policy on IPR management. A key feature will involve the management of the intellectual property of the institution in terms of maintaining a targeted and strategic IPR portfolio, enforcing ones' rights when necessary, transferring intellectual property rights appropriately and at the optimum value, striking collaborative linkages, etc. Some aspects of this institutional process are illustrated in Figure 5.

In the case of patents and designs they have to be renewed periodically in every country where they have been granted. It is well accepted that maintenance of an IPR portfolio can be very expensive. Quantitative evaluation of factors such as R&D investments to the royalty ratio will have to be done. A periodic cost benefit analysis (return on investment) is to be made to assess the patents/designs portfolio that is to be renewed in different parts of the world. The intricate relationship between the technical value of the patented innovation and its commercial and strategic implication needs to be well understood at the institutional level.

CSIR has had a relatively long tradition of managing IPR. However there has been a renewed thrust in the last few years. R. A. Mashelkar, Director General of CSIR has spearheaded the Patent Movement and the National Patent Literacy Mission through awareness workshops run by the DSIR/TIFAC/CSIR, Administrative Staff College of India, Hyderabad and others. However a lot needs to be done in this area before we can consider ourselves adequately prepared to face the future.

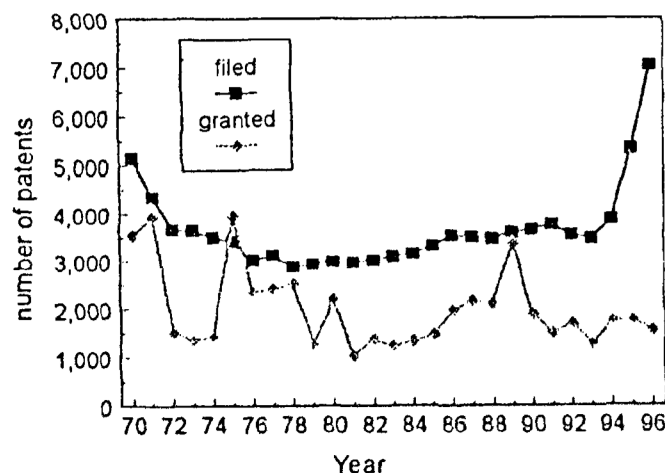


Figure 4. Patenting in India - profile.

IPR study groups

Our scientists and technologists need to be trained in the art of patent reading, claims interpretation, mapping of claims into prior art so that this institutional resource can be used effectively to provide technical support to:

- Writing 'world-class' patents based on their innovations
- Defending patents
- Formulating oppositions/revocation cases (recent case on haldi/basmati reinforces its need)
- Identifying infringements
- Preparation of well focused R&D programmes and striking collaborations with Business Houses

- Technology transfer/liaison offices in institutions
- Evaluating effectiveness of 'patent portfolios' based on a cost benefit analysis, royalties earned, strategic intent, etc.

These study groups consisting of cross-functional and cross-organizational teams will contribute to the needs of any National Task Force on patents.

Support services

Access to international databases on patents for their technical content, legal status, will be necessary at multiple points in the country. Information scientists will have to be trained to mine information from patents cost effectively and in a timely manner. A patent alert system will need to be set-up so that research groups can be fed with focused and relevant patent-related information. Updated on-line information on patents filed and granted in India is not available. This becomes a bottleneck to researchers and business community today. We will have to set up an efficient system to create easily accessible and updated databases on Indian patents. Such a support service can become a part of the Indian National Science Documentation Centre. CSIR has a database of Indian Patents (INPAT) but much needs to be done to make it a useful and world-class facility.

Technology mapping exercise using patent information coupled with other national human resource databases (technical/business) should be used to create knowledge directories which are strongly anchored to the process of identifying national priorities and formulating the national science and technology strategy.

National bodies such as Department of Science and Technology with its associates, Council of Scientific

Industrial Research, Indian Council of Medical Research, Department of Electronics, Defense Research & Development Organization need to set up active liaison units with professional expertise in IPR. These can act as resource centres for various institutions in the country. Knowledge bases of our national resources such as the Indian bio-diversity, traditional medicinal and cosmeceutical practices, techniques of our craftsmen, etc. have to be created and made accessible to diverse practitioners. Bringing innovations based on traditional knowledge and practices under the IPR regime are current issues awaiting explosive growth. Recent revocation of the Haldi Patent and controversies surrounding Basmati (which is a complex matter involving patent/trademark/geographical indication) have driven home the point for an intimate appreciation of the techno-legal issues involved in IPR. Similarly intellectual property protection of innovations in research tools, software, biotechnology, technologies in strategic areas of defence and space exploration, etc. will severely impact implementation of programmes in Indian science and technology which, in turn, affect Indian trade and industry. Issues connected to such areas also need to be addressed.

In order to enhance working and commercialization of patents, a formal 'patents market' needs to be setup, which can act as a 'one-stop-shop' for industries and entrepreneurs. This would maintain an active database of patents available for licensing. National institutions would be the best centres for such activities.

A major weakness in India is the lack of technically trained 'patent attorneys'. Formal training schemes have to be setup to rigorously train technical personnel as patent attorneys who will be able to handle the complex techno-legal issues emerging from rapid advances in science and technology. A special brand of legal prac-

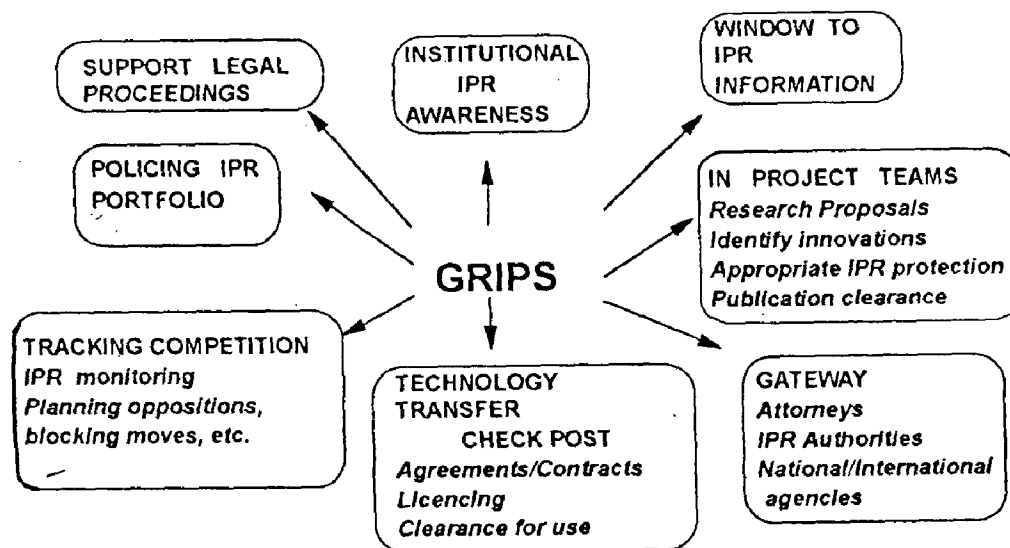


Figure 5. Group intellectual property services (GRIPS): Evolving roles (Source: ref. 4).

tioners have to be created with a sense of urgency. Presently there is no formal training institute of patent attorneys and legal personnel.

Educational institutions including our technical institutes and management institutes will have to introduce IPR into their curriculum to make student aware of IPR and its impact on innovation, trade and industry.

Role of the Indian Patent Office

The Indian Patent Office has to face a cultural revolution with its infrastructure, manpower with its working methods needing to undergo a non-recognizable metamorphosis to meet the mounting demands of the emerging times. The infrastructure remains antiquated, rusty and severely lacking in technology and personnel resources. Over 30,000 patent applications are yet to be examined in our patent offices. Speed of response is the need of the hour. It has remained on the sidelines for too long. The government will have to bring it to the mainstream of national events in science, technology and industry. The role of the patent offices will have to be transformed from mere governance of the patent system to one of being a proactive partner in national awareness of IPR and technology/business development.

National academies and industry associations – their involvement

These bodies provide diverse and focused platforms for professionals in the country. The attitude of 'casual awareness' among their members have to give way to serious 'professional involvement' with quantitative appreciation of IPR and its implications. Active debates on issues related to 'research exemption', 'protection of

living forms/gene sequences', 'biodiversity', 'protection of computer software', etc., organized through their platforms as journals/meetings and conferences would give the much-needed involvement of professionals in arriving at workable policies.

As these concepts gain momentum in India, our institutions will have to evolve a new ethos by setting up frameworks/processes and respond to business-driven R&D functions, identify focused projects, learn to negotiate terms and at the same time deliver 'world class' scientists and engineers as a part of their academic commitment. Among other professional expertise, our institutions will have to master 21st century techniques in knowledge engineering, information metering, generating and managing Intellectual Property Rights to meet the industry and society with a sense of confidence and positive responsiveness.

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