

Innovation in India

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Introduction

Amongst the Asia Pacific regions, India has one of the longest established Intellectual Property systems with roots that can be traced back over 150 years to the enactment of "The Exclusive Privileges Act, 1856"¹. Despite this, until recently India has been a relatively quiet contributor in terms of global innovation.

Up to the last decade India could be characterized as a net user of intellectual property. The enactment of the Indian Patent Act of 1970 meant that product patents for medicinal products were no longer recognized and only process patents continued to be recognized. The Indian pharmaceutical industry took this opportunity to demonstrate "its reverse engineering skills" which also resulted in the availability of "affordable medicine."

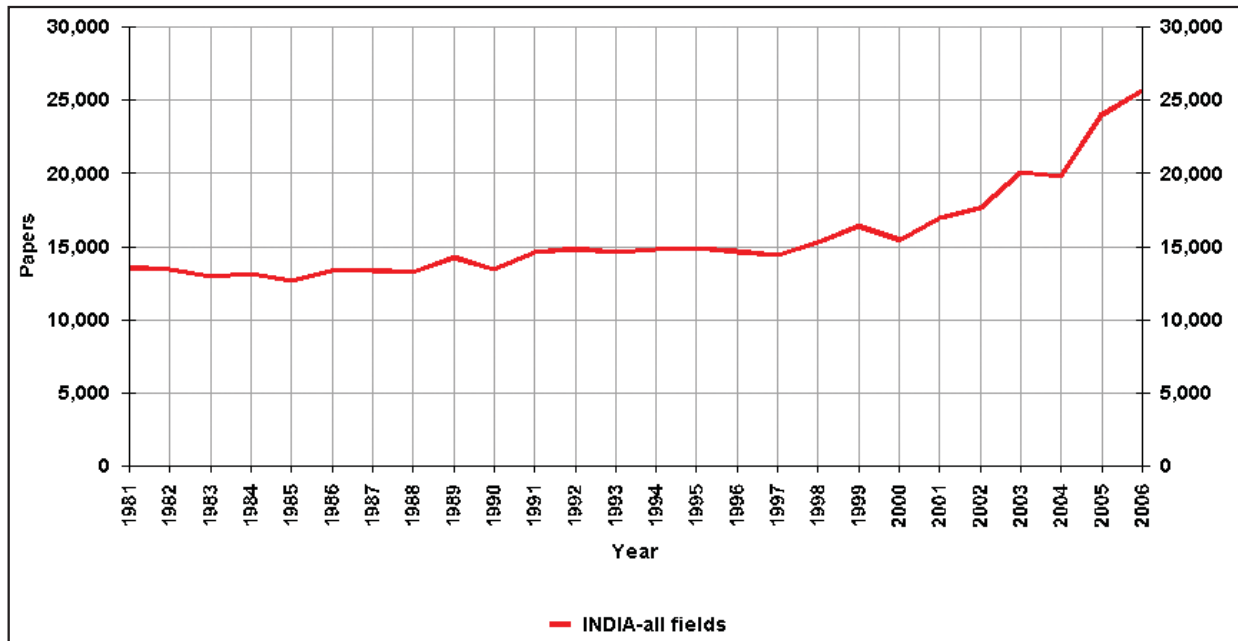
However, with India acceding to the World Trade Organisation in 1995 and subsequent discharge of its obligations under the TRIPS agreement, several initiatives have been taken to create a healthy environment for innovation. As a result India can now also be viewed as a creator of intellectual property.

Current Issues

Despite these moves to modernize India's patent system, there are some current issues with IP rights in India. It can take years to secure protection. Enforcement of rights through the courts can be a slow process. There is also controversy about the current patent law with the recent Indian court decision to refuse a fresh patent for incremental innovations made by Novartis on its 20 year-old blood cancer treatment drug, Glivec. This decision is based on Section 3 (d) of the amended Patent Act, which effectively disallows patents for minor innovations on known drugs by stipulating that incremental innovations or any type of modifications must enhance the therapeutic effectiveness of the drug substantially for it to qualify for a fresh patent. This has resulted in Novartis moving large investments in India elsewhere³.

The importance of intellectual property as a major source for economic and technological development is however recognized within India. The Economic Times recently reported that the government is to put forward legislation concerning the ownership of IP created in publicly-funded research institutions and universities. This will, the report says, "provide a legal framework that would develop an active interface between the funding agencies, academia and the industry, which has been lacking so far"⁴.

Figure 1: Indian publications 1981 - 2006



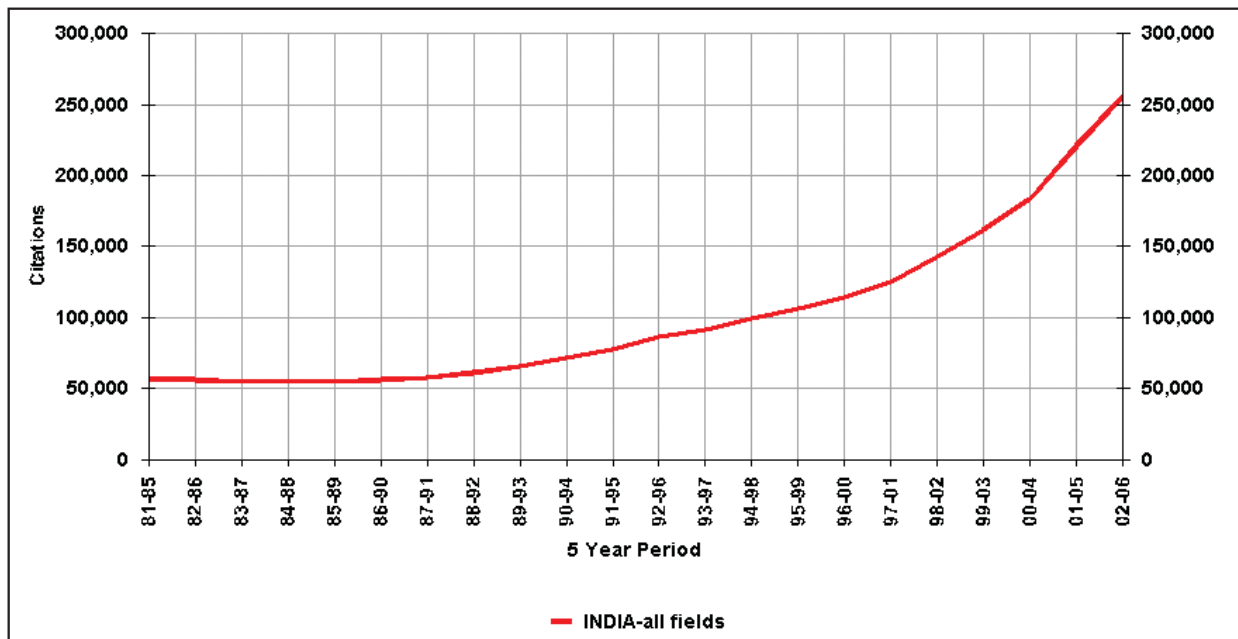
Source: Thomson Scientific National Science Indicators 1981 – 2006 standard Edition

Current Trends

The recognition of intellectual property as a driver for economic and technological development is also demonstrated by the increasing creativity and impact of Indian research and technology. This is clearly illustrated by reviewing both trends in publication of scientific literature from India and by examining patenting trends.

The number of publications from India had been stable at around 15,000 papers per year until 2000, when there was a pronounced upturn. In the latest 5 years, it increased to just over 25,000 papers per year. This is a 45% increase. The impact of this research has also been increasing over this time as illustrated by the citation rate of Indian research publications:

Figure 2: Indian publications citation rates 1981-2006



Source: Thomson Scientific National Science Indicators 1981-2006 Standard Edition

From the late 1980's onwards, the citations India receives has increased constantly. Research papers from India received 256,253 citations in the latest 5 years; this is 4 times as many citations as received in early 1980's.

As regards patents, today in common with others countries in the region (particularly China and Korea), India is experiencing a rapid increase in patenting activity. Applications have risen from around 10,000 per annum to 24,505 for the financial year 2005-2006, a growth of 40% over the previous financial year 2004-2005⁵.

Not only has the volume of innovation increased dramatically, the players and technologies have also changed significantly in recent times.

A ranking of the Top 10 patent assignees for all Indian inventions from 1968 – 2004 shows the Council for Scientific and Industrial Research dominating the table with the rest being headed by Hindustan Lever (the wholly owned subsidiary of Unilever) and Hoechst (now absorbed into Sanofi-Aventis) with its Indian subsidiary Hoechst India:

Figure 3: Top 10 assignees for Indian patent publications, 1968-2004

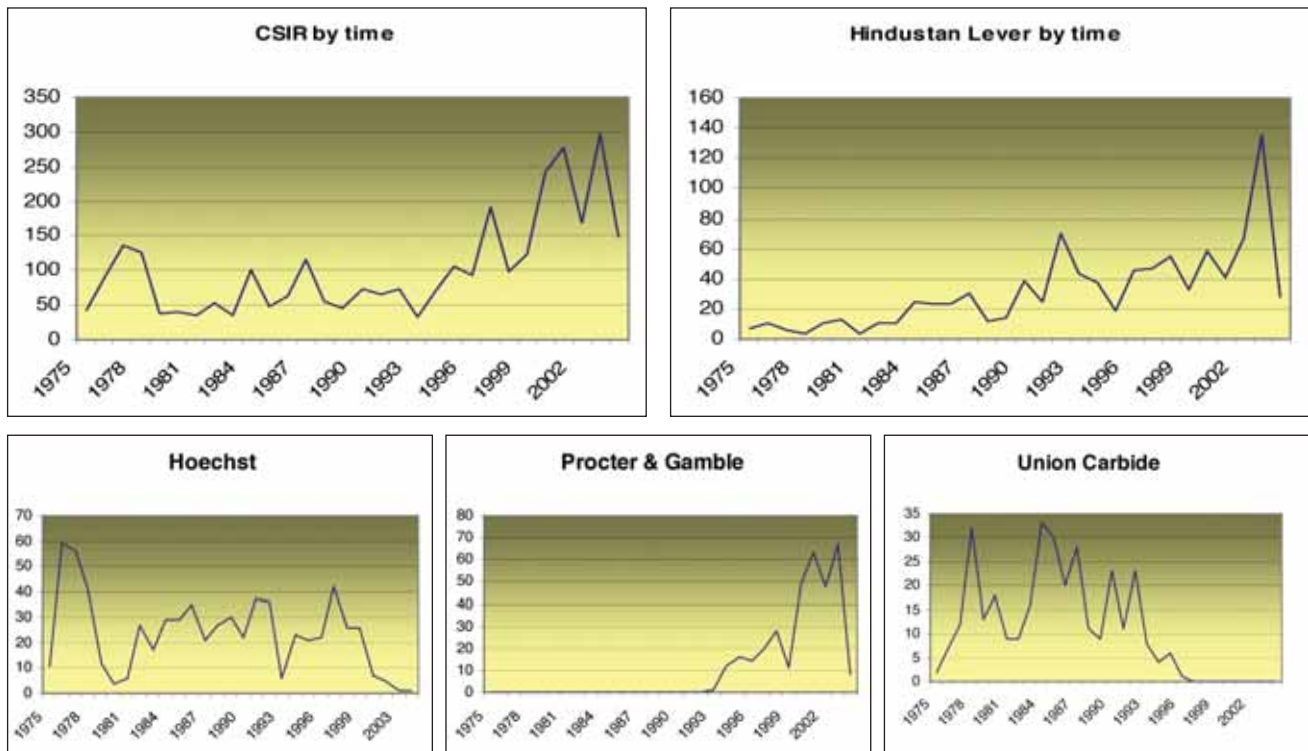
Rank	Assignee/Applicant	No of Indian patents	No of patents overall	%ge of total patents
1	COUNCIL SCIENT IND RES	3083	8510	36.22%
2	HINDUSTAN LEVER LTD	946	3511	26.94%
3	HOECHST	766	170375	0.45%
4	SIEMENS AG	685	498690	0.14%
5	WESTINGHOUSE ELECTRIC CORP	477	131175	0.36%
6	UNION CARBIDE CORP	365	62677	0.58%
7	PROCTER & GAMBLE	337	108401	0.31%
8	RIETER AG MASCHF	336	8649	3.88%
9	LUCAS IND PLC	326	31280	1.04%
10	ICI PLC	308	100722	0.31%

Source: INPADOC database on Dialog

Patenting activity by the top two assignees in India over this time period has steadily increased. As locally based organizations, note also the significant local protection of their innovation as signified by the substantial proportion of Indian patents (25%+) in their total patent portfolios compared to the other assignees (less than 4%).

By contrast, Indian patents assigned to Hoechst have declined to almost zero over this time period from a peak in 1997. Other notable trends include the increased investment in India in 1992 by Procter & Gamble as evidenced by the advent of patenting in the following year and the decline in patenting activity by Union Carbide from 1984 onwards with complete cessation of patenting in 1998 (the Bhopal disaster occurred in 1984).

Figure 4: Significant patenting trends amongst top 10 assignees for India patent publications, 1968–2004



Source: INPADOC database on Dialog

With the recent growth in patenting activity in India, Indian patents are now included in Derwent World Patents Index® (*DWPI*SM) from December 2004 onwards in order to give users comprehensive and quick access to Indian patents. This coverage complements the INPADOC coverage for Indian patents up to mid-2004.

A snapshot of the top 10 assignees from 2006 using the current data from *DWPI* shows a markedly different picture to former years:

Figure 5: Top 10 assignees for Indian patent publications, 2006

Rank	Assignee/Applicant	No of Indian patents	No of patents overall	%ge of total patents
1	MICROSOFT CORP	584	15223	3.84%
2	COUNCIL SCIENT IND RES	476	2152	22.12%
3	JOHNSON & JOHNSON	271	3691	7.34%
4	QUALCOMM INC	249	3779	6.59%
5	HONDA MOTOR CO LTD	237	45350	0.52%
6	SAMSUNG ELECTRONICS	216	126996	0.17%
7	KONINK PHILIPS ELECTRIC	194	23008	0.84%
8	THOMSON LICENSING SA	157	3263	4.81%
9	HINDUSTAN LEVER LTD	146	2238	6.52%
10	MOTOROLA INC	145	23193	0.63%

Source: *DWPI* database on Dialog

Ranked second, CSIR still features as a major innovator in India, but Microsoft has emerged from nowhere as the most prolific applicant of Indian patents during 2006. This is consistent with the Dec 2005 announcement of a \$1.7 billion investment by Microsoft in India.

As noted above, in the past, India only permitted patents for processes and not products. With new amendments to the Patent Act, it is now possible to obtain product patents in pharmaceuticals and agrochemicals, telecoms, and software industries. The organizations represented in this list reflect the balance of new technologies now permitted under these amendments.

This diversification of technology is also illustrated by an analysis of the top 10 International Patent Classifications for Indian patents published in 2006:

Figure 6: Top 10 IPCs for Indian patent publications, 2006:

Rank	IPC	No of Indian patents
1	A61K – PREPARATIONS FOR MEDICAL, DENTAL, OR TOILET PURPOSES	2905
2	G06F – ELECTRIC DIGITAL DATA PROCESSING	1931
3	A61P – THERAPEUTIC ACTIVITY OF CHEMICAL COMPOUNDS OR MEDICINAL PREPARATIONS	1762
4	C07D – HETEROCYCLIC COMPOUNDS	1419
5	H04L – TRANSMISSION OF DIGITAL INFORMATION, e.g. TELEGRAPHIC COMMUNICATION	1175
6	C07D – ACYCLIC OR CARBOCYCLIC COMPOUNDS	1072
7	H04B – TRANSMISSION	822
8	H04Q – SELECTING	743
9	B01J – CHEMICAL OR PHYSICAL PROCESSES, e.g. CATALYSIS, COLLOID CHEMISTRY	674
10	C12N – MICRO-ORGANISMS OR ENZYMES; COMPOSITIONS THEREOF	657

Source: DWPI database on Dialog

Conclusions

Although difficulties exist with the Indian IP system, the importance of IP as a driver for economic and technological development is recognized. This is demonstrated by the increasing creativity and impact of Indian research and technology as illustrated by trends in both scientific literature and patent publications.

There are also other some other key pointers which demonstrate this:

- The Indian Patent Office has recently joined the patent offices of USA, Japan, South Korea, China and Europe in offering online filing for trademark and patent applications⁶;
- Indian companies are beginning to assert their IP rights – for example, the announcement by Bajaj Auto Ltd (manufacturers of that quintessentially Indian mode of public transport, the auto-rickshaw) to defend its intellectual property after rival TVS Motor Co said it would take libel action against Bajaj for accusing it of breaching patent rights⁷;
- The Council for Scientific and Industrial Research (CSIR) has recently has purchased Thomson Scientific's *ISI Web of Knowledge* platform to provide access to its 10,000 scientists across 45 labs in India, allowing all users to cross-search complementary resources and "enhancing the CSIR drive for more precise and meaningful research that will further the overall development of science and technology in the country"⁸.

These and other developments will be watched with interest as India takes its place alongside the other major innovating nations.

Thomson Innovation Award

In recognition of the increasing importance of India as a net contributor to innovation, Thomson Scientific has established the Thomson Innovation Award which will be awarded at the InfoVision 2007 conference.

This award is designed to recognize innovation and entrepreneurship in India and will be awarded to the organization that in the judgment of Thomson Scientific most represents the new spirit of innovation in India.

Potential award winners will be selected from small and medium-sized enterprises headquartered in India. The award winner will be decided by analyzing their innovation through patented technology as recorded in Thomson Scientific patent information services. Criteria for award will include the number of patents, the efficiency of innovation and the impact of innovation as measured by patent citations.

The methodology involves ranking the number of patents to small and medium-sized Indian enterprise organizations, determining the efficiency of innovation by ranking the number of inventions per unit R&D spend and determining the impact of innovation by ranking Top 5 IPCs per assignee relative to total IPCs adjusted for R&D spend and also by number of inventions cited by other inventors in later published patents.

The inaugural award winner will be announced during InfoVision 2007 in Mumbai, India Dec 17th – 19th 2007.

¹ Indian Patent Act introduced 1856 and provided protection of inventions based on the British patent law of 1852; Japan Patent Act initially introduced 1871, repealed one year later and finally came into force in 1885; Korean Patent Law enacted 1946 directly after independence from Japan; Chinese Patent Law introduced 1985

² Address by Dr K Anji Reddy, Chairman, Dr.Reddy's Research Foundation at Pharmacophore 2004 International Symposium January 16-17, 2004 Hotel Viceroy, Hyderabad

³ "Novartis moving from India", Virendra Parekh, [Khaleej Times Online](#), August 27th, 2007

⁴ Legal framework on sharing of IP, [The Economic Times](#), 31 Aug, 2007, 0315 hrs IST, Subhash Narayan & Gireesh Chandra Prasad, TNN

⁵ [Indian Patent Office Annual Report 2005-2006](#) (latest available)

⁶ ag-IP-news 23/8/2007 09:46 GMT

⁷ Reuters India newsfeed Mon Sep 3, 2007 4:25PM IST

⁸ "THOMSON SCIENTIFIC SIGNS MULTI-YEAR AGREEMENT WITH THE COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (CSIR)", Thomson Scientific Press Release, 14th Sept 2007