SCIPR-2014: Paper presented in the National Conference, pp. 121-134

Intellectual Property Rights in India: Significance of Patents

Y. Srinivasa Rao
Deputy Librarian, School of Planning and Architecture, Vijayawada-521104

ABSTRACT

This paper highlights an overview of Intellectual Property Rights (IPRs) in India and their trends. Importantly, patents have played a key role in changing national and global innovation landscape.The IPR trends during 2003-13, the approved rate of designs (87.38%) and trademarks registrations (65.54%) were significantly higher than the granted patents (22.06%) in India. Though, the patents (63.26%) have generated huge revenues than the designs, trademarks and GIs over last decade.Total number of patent grantsoverthe last 10 years was 69,745 out of which 21.71% were granted to Indians and 78.29% wereto foreign applicants. Maharashtra, Delhi and Southern states are leading in filing patents. Streams like chemical and mechanical engineering have produced highest number of patents whereas bio-technology and foods field were at the low preference.

This paper also deals with the patent grants in Asian countries.On an average, the percentage of patent grants in Japan, Korea and Taiwan was 43.08, 43.95 and 45.88 respectively. China has shown massive interest in patent filing in recent years and the overall percentage of patent grantsover last dozen years was 32.99%. When compared withAsian countries, India was least innovative nation among them in terms of patent filing witha granting percentage of23.07. It indicates, India is conscious about its IPR polices with higher rejection of filed patents. It has also shown considerable increase in its research and innovation capabilities. Over the last 10 years, India managed to produce 2.84 lac research publications. In the 2012, India ranked 9th in scientific publications at a global share of 3.5%. Inthe global innovation index over the last 5 years,on an average,Indian inputsub-index ranking was 74.6% and output sub-index ranking was 45.8%.Besides, India was often ranked at No. 01in the region of Central and Southern Asia for the last 5 years. India has been consistently ranked in the top ten when it compared to lower-middle-income (LMI) economies worldwide. However, IPR culture in India is anything but satisfactory. It demands effective strategies for encouraging and building IPR activities and explore scientific and industrial research and innovationin India.

Keywords: Intellectual Property Rights; Patents; Indian Patent Office; Copyright; Global Innovation Index

1. INTRODUCTION

Developed countries are recognized today mainly by their advancement of intellectual creativity and innovation. Knowledge is the key driver for transforming a nationrich and innovative. A kind of new knowledge (creations) derived from human mind (human capital) is often called Intellectual Property (IP) and it has beendefined as original creative work

manifested in a tangible form that can be legally protected (WIPO, 2008). Intellectual Property Rights (IPRs) are statutory rights that allow originators exploit their inventions or innovations exclusively for a particular period of time. Factually, theIPR laws bring stable, safe and sustainable eco-system over intellectual products, processes and services for the sole benefit of the society. Besides, the property has its own uniqueness, exclusiveness or monopoly that allows inventors or licensors to exploit commercially. In fact, there are two branches of IPR: one is industrial property (*first recognized in Paris Convention in 1883*) and second one is copyright (*first recognized in Berne Convention, 1886*). Industrial property consists of patents, trademarks, geographical indications, and industrial designs etc. that are territorial in nature. Filing and registration with a particular territory and for a particular period of time is essential. After 2009, patents filings grew by 7.6% in 2010, 8.1% in 2011 and 9.2% in 2012 (2.35 million applications filed) while industrial design filings grew by 17% and trademark filings by 6.0% in 2012 world-wide(WIPO, 2013).Among the industrial property, patents play a keyrole in changing national and global innovation landscape.The main purpose of the patent is to promote innovation, competitiveness, economic growth, and visibility.Historically, Venetian law of 1474 made the first systematic attempt to protect inventions by a form of patent, which granted an exclusive right to an individual for the first time (Lucchi, 2007).Copyright (consists of literary, dramatic, musical artistic works including architectural works etc.) is an intangible property for a specific term. In India it is 60 years.Without the invention of the printing press by Johann Gutenberg around 1448, book publishing and its copyright consequences would not have come to limelight and marketed today. Copyright is not a perpetual right (Majmudar & Co) and ideas cannot be copyrighted, protected and even patented. Majority of research findings published in peer-reviewed journals remain under copyright. Over 90% journals are now online and about 1.5 million STM articles are produced in a year. Average growth rate ratio per year for journals titles, articles and researchers was 3.5:3:3 over the last two centuries (Ware & Mabe, 2009). In fact, copyright is automatic, no need to register across for its protection. Hence, significance of IPRcommunication and dissemination has greater impact on society for not only safeguarding the nation's intellectual creations but also generating revenue to build knowledge-based economy.

This paper aims to present an overview of IPRs, their trends and revenue generated in India; significance of patents in India by region and stream; evaluation of patent grants in Asia and India's ranking in global innovation index. It also provides strategies for patenting.

The source data over the last 10 yearswere extracted from annual reports of Controller General of Patents, Designs & Trade Marks (CGPDTM), India (*www.ipindia.nic.in/*) and focusing mainly on patents, trademarks, industrial designs and GI applications filing and grants/registrations.Data on Indian IPR revenue generation were also collected and presented (Table 2) to present the economic value of IP over last 10 years.Besides, data from European Patent Office (EPO) have been considered for evaluation of patent filing and grants in Asia during 2001 to 2012. World Intellectual Property Organization (WIPO) estimates on IP and the ranking of Global Innovation Index (GII) were also considered for this study for pressing the value of Indian research and innovation.

2. IPR IN INDIA: AN OVERVIEW

India is a huge country with a population of more than 1.2 billion with an aspiration to build intellectual, inclusiveand sustainable knowledge based innovative society. Over centuries, India is known for colossal history of science demonstration, swashbuckling cultureand heritage of traditional knowledge. Zero was invented by India along with the decimal system of numerals that is called Arabic. By the fifth century, an Indian had discovered the earth's axial rotation (Stevens, 1982). Stylish and superior quality of articles such as fine fabrics of cotton and silk, embroidery, painted and enamelled wares, swords and knives and gold and silver jewellery were produced in India(INSA, 2001). But the nation did not exploit these in commercial ways and so failed in this aspect.The culture of IP in India roots from centuries; the efforts to stimulate a change in the society for meeting both domestic and overseas needs are to be sustained vigorously. India signed theTrade-Related Aspects of Intellectual Property Rights (TRIPS) agreement on 15 April 1994 to set up minimal standards, procedures and remedies to protect IPRs. TRIPS agreement also allows a great deal of lawful pluralism among WTO members about standards of patentability and about key flexibilities, including both patentable subject matter and grounds for compulsory licences (CLs) (Jishnu, 2014). Besides, India has a similar pact with the EPO. Under this agreement, on 2 February 2009 the Indian government granted access to its Traditional Knowledge Digital Library (TKDL), a unique database that houses the country's traditional

medical wisdom, to examiners at the EPO for reference before grant of patents (EPO, 2009).Ultimately the IPR protection can reap rewards in terms of greater domestic innovation and increased technology diffusion in developing countries (Falvey and Foster, 2006). In fact, there are seven categories of IPR Acts in India (Fig. 1) representing the rights for protecting the nation's intellectual creations or innovations of human mind. The office of the Controller General of Patents, Designs & Trade Marks (CGPDTM) also called as IP Office is responsible for the administration of all acts through its IP Offices located at Mumbai, Delhi, Kolkata, Chennai and Ahmedabad.

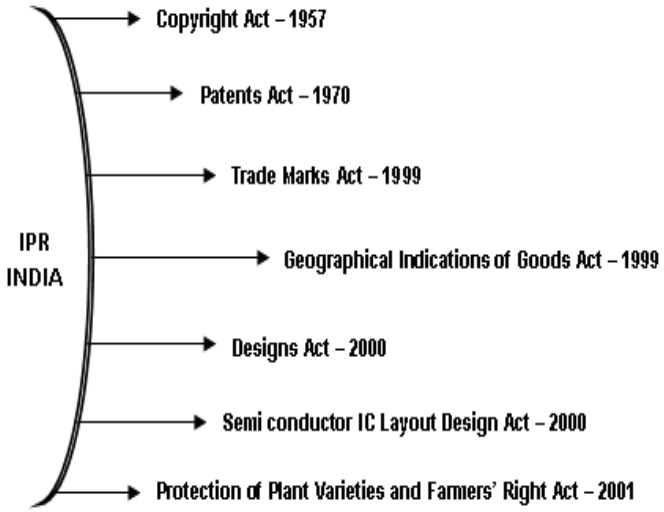


Figure 1: IPR Acts in India

3. COMPARISON OF IPR TRENDS

Office of the CGPDTM follows its own norms and procedures in receiving, examining IPR applications and granting them in due course of time.Initially, the IPR in India focused mainly on patent, designs, and trademarks. ButGeographical Indications (GI) Act – 1999 was brought into force on 15th September 2003. Before the TRIPs agreement,GI was not protected in India (Kumari and Reddy, 2006). Similarly, semiconductor IC (integrated circuits) layout design and plant variety and farmers' rights have been protected under the respective acts mentioned in Fig. 1.

Table 1 Comparative trends of IPRs granted/registered for the last 10 years

Year	Patents			Designs			Trade Marks		
	Filed	*Granted*	*% granted*	*Filed*	*Registered*	*% Registered*	*Filed*	*Regi-stered*	*% Regi-stered*
2003-2004	12613	2469	19.58	3357	2547	75.87	92251	39762	43.10
2004-2005	17466	1911	10.94	4017	3728	92.81	78996	45015	56.98
2005-2006	24505	4320	17.63	4949	4175	84.36	85699	184325	215.08
2006-2007	28940	7539	26.05	5521	4250	76.98	103419	109361	105.75
2007-2008	35218	15261	43.33	6402	4928	76.98	123514	100857	81.66
2008-2009	36812	16061	43.63	6557	4772	72.78	130172	102257	78.56
2009-2010	34287	6168	17.99	6092	6025	98.90	141943	67490	47.55
2010-2011	39400	7509	19.06	7589	9206	121.31	179317	115472	64.40
2011-2012	43197	4381	10.14	8373	6590	78.71	183588	51735	28.18
2012-2013	43674	4126	9.45	8337	7252	86.99	194216	44361	22.84
Total	**316112**	**69745**	**22.06**	**61194**	**53473**	**87.38**	**1313115**	**860635**	**65.54**

Source: Annual Reports of IPR

Table 1 indicates the trends in applications filed and granted/registered for different types of IPRs in India over the last ten years. With respect to patents, the total number of applications filed were 3,16,112 of which 69,745 (22.06%) were granted. The percentage of registered designs (87.38) and trade marks (65.54) were considerably higher(as compared to patent grants). The GIs registry has received 404 applications till 31 March 2013.

3.1 Comparison of IPR Revenue Generation

Table 2 shows the revenue generated by the PTO in India has been gradually increasing over a decade. During the financial years 2003- 2013, the total revenue earned over IPR was 1865.18 Crore, in which 63.26% was generated from patents and 36.16% from trademarks. While designs, GIR and PIS/IPTI generated It is also seen that the revenue with 0.52%, 0.04% and 0.02% respectively. However, the revenue over the IPR has been increased substantially for the last 10 years except in when it decreased over the previous year.

Table 2 Comparison of the revenue generated for the last 10 years (Rs)

Year	Patents	Designs	Trademarks	GIR	PIS/IPTI	Total
2003-2004	16,53,66,982	53,01,165	27,06,75,959	45,000	0	44,13,89,106
2004-2005	40,72,54,457	64,59,282	37,94,85,262	1,10,000	0	79,33,09,001
2005-2006	93,64,28,079	75,60,563	49,75,09,410	2,18,090	1,02,911	144,18,19,053
2006-2007	1,06,34,17,330	1,00,80,300	55,79,28,069	3,47,370	1,56,338	163,19,29,407
2007-2008	1,30,24,08,136	1,00,23,450	63,00,36,633	4,18,960	2,78,542	194,31,65,721
2008-2009	1,56,14,63,824	1,23,66,048	69,15,02,297	4,63,360	5,05,510	226,63,01,039
2009-2010	1,42,61,73,541	91,45,030	71,61,25,436	4,89,440	5,98,954	215,25,32,401
2010-2011	1,58,78,10,509	1,06,26,985	86,15,00,000	2,75,706	5,39,585	246,07,52,785
2011-2012	1,64,40,23,224	1,26,11,650	1,03,53,00,000	48,08,265	6,43,000	269,73,86,139
2012-2013	1,70,47,84,657	1,29,32,740	1,10,45,00,000	8,77,750	1,45,712	282,32,40,859
Total	**1179,91,30,739**	**9,71,07,213**	**674,45,63,066**	**80,53,941**	**29,70,552**	1865,18,25,511

Source: Annual Reports of IPR

4. SIGNIFICANCE OF PATENTS IN INDIA

Patents are becoming centre stage for nation'sscientific, industrial and economic growth and development. Indian Patent Law defined inventionas a new product or process involving an inventive step and capable of industrial application (sec. 2(1) (J), CGPDTM, 2008). In India, the Patents Act, 1970 has come into force and aimed to encourage and protect the inventions that are new, non-obvious, and commercially applicable and thus enabling the innovators to appropriate the returns on their innovative activities. One hand the Act is protecting the patents and the other hand ensuring the technology transfer, public interest and specific needs of the country. The Act has been amended many times in compliance with the provision of TRIPS in 1972 (included Patent Rules), 1999 (for administering Patent Office), 2002 to meet with the second set of obligations (term of Patent etc.), 2003 (Rules amended) and 2005 (Patent (Amendment) Rules) respectively. Patent rights are territorial and can be filed in each countrytoprotect them in foreign countries through a Patent Cooperation Treaty (PCT).In India, the patent is valid for 20 years and can be transmitted or assigned but it cannot be renewed. The patent grant also excludes others from making, using, selling, importing, and offering an invention for up to 20 years. Sir Jagadish Chandra Bose was the first Indian who owns a US patent on *"Detector for electrical disturbances" (US 755840* and filed on Sept. 30, 1901) granted on 29 March 1904.In general, Soini and Others (2008) emphasized that the life span of a patent right may be divided into three category of acts - constitutive (filing, examination and

granting), consequential (exploitation of rights and protection against infringements as well as capability to grant licences acts), and terminating (expiration after 20 years, revocation for example due to unpaid fees or successful opposition). For the last two decades, the patent laws have been strengthened and modified for meeting both domestic and global needs.

5. PATENTS GRANTED IN VARIOUS FIELDS

Research and development of today is purely multi-disciplinary and collaborative. Patents reflect nation's economic growth through scientific and technological advances in multiple disciplines. Figure 2 shows number of patents granted in various fields of innovation during the last 10 years. During 2003 to 2007, the ratio of domestic and foreign innovations granted was about 1:2; from 2007 to 2009, there was an accidental growth in granting patents as compared to 2009-2013. However, total number of patents granted for the last 10 years was 69,745 out of which 15,139 were granted to Indian and 54,606 were to foreign applicants. Streams like chemical (16,534) and mechanical (15,518) engineering have produced more patents, while bio-technology (2,749) and food (960) fields were at low priority of innovation.

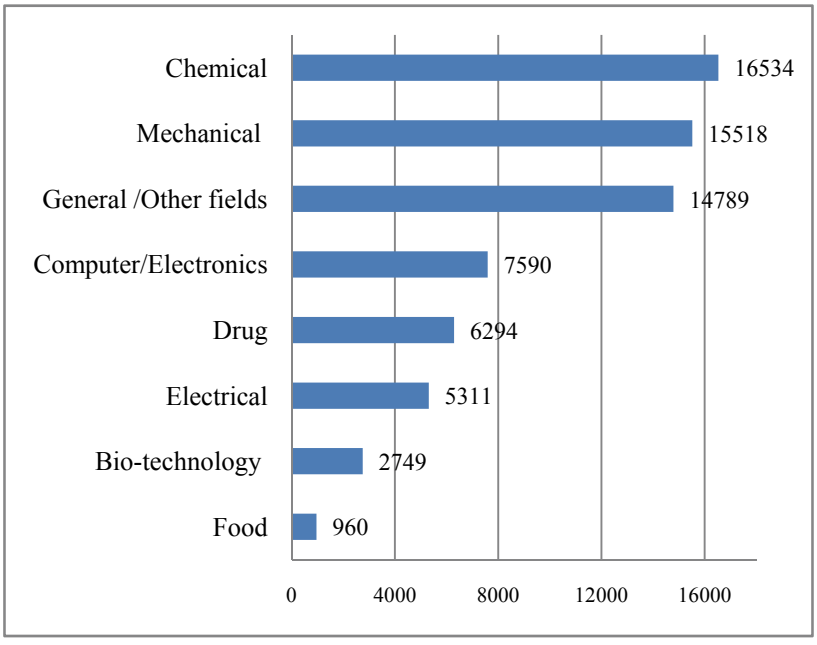


Figure 2: Number patents granted during 2003-2013 in various fields.

6. PATENT FILING IN INDIA

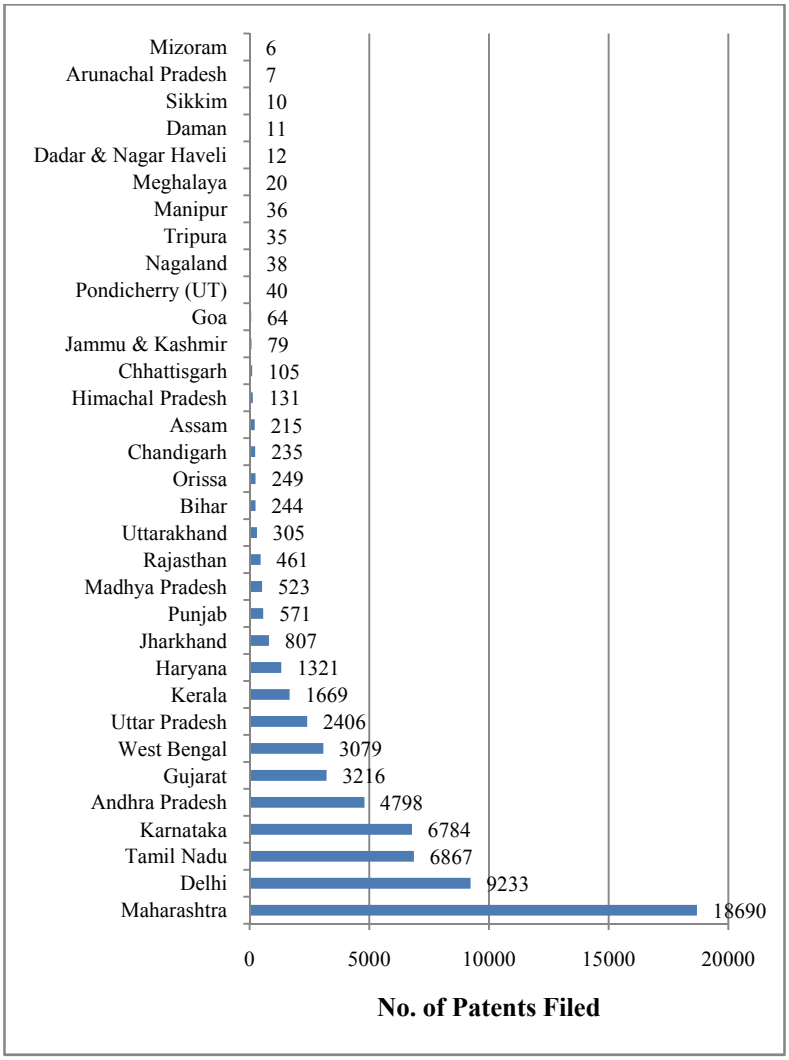


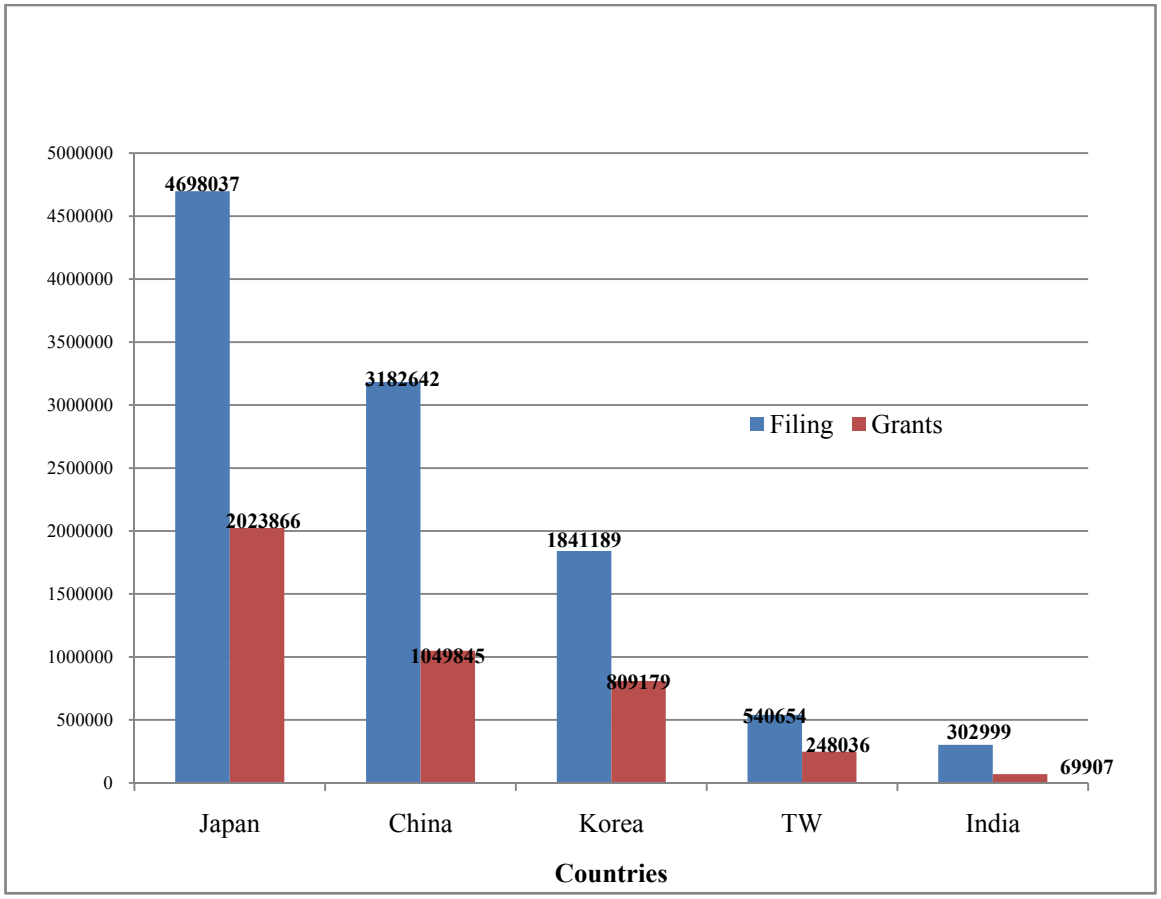
Figure 3: State and UT-wise patent filing during 2003-2013.

Patent filing is purely territorial.IP offices have been located at various regions to administer all IPR activities in India. Patent filing is region wise and it provides a clear communication of research and development in the states and union territories in the respective regions.

From Fig.3, it is clearly understandable that the total number of patents filing in states and union territories in India was 62267during the period. The patents filed in 2003 were3218 and in 2013 it has increased to 9604, a 10.25% growth rate. Maharashtra has recorded the highest number (18,690) of patent filings; Delhi (9,233) at distant second

followed by Tamil Nadu (6,867), Karnataka (6,784), Andhra Pradesh (4,798) and so on. Kshitij and Joshi (2012) opined that, Maharashtra is the hub of many industries units as well as academic institutions and they also indicate that the states housing Patents Offices are among the top rankers as well, with West Bengal being an exception. North-eastern states such as Arunachal Pradesh (7) and Mizoram (6) are at the bottom in filing patents.

7. PATENT FILING AND GRANTS IN ASIAN COUNTRIES DURING2001-12



Source: European Patent Office website

Figure 4: Patents filed and granted in Asia in 2001-12.

Figure 4 shows the patent filing and grants in Asia.Japan has filed highest number of patents with a grantingpercentage of43.08 over the last dozen years. It reveals that Japan's patent filing is consistently high from 2001 to 2005 while granting was on an average growth rate of 28.8%. After 2006, Japan filingsreduced graduallybut percentage of the

grants has increased to55.90. It shows the quantity of patents in Japanhas been on the increase. With respect to China's innovation, there was a massiveexplosion in patent filing whichcrossed Japan in recent years. Overall, China's patent grant percentage increased to 32.99 over dozen years. As. Prud'homme (2012) observed, the reason behind patents growth is a variety ofsocioeconomic factors (e.g. rise in the educated workforce) and economic competition have likelyled to the growing capacity and drive of Chinese entities to file patents. But, a few indicating factors (lower average life-span, lower percentage of patents in-force**,** higher rates of utility model invalidationsandpoor scores in terms of patent citations) suggest that such polices have resulted in a huge amount of junk patents (Giacopello, 2012)**.** The Figure also indicates the granting percentage of patents by Korea and Taiwan as43.95 and 45.88 respectively.In contrast, India was among the least innovative nationsamong Asiancountries in terms of patent grants over the last 12 yearswitha low percentage of 23.07.However, India is conscious about its IPRpolices and thestrong enforcement system in producing patents.

8. INDIAN RESEARCH AND INNOVATION

Indeed, India has shown considerable increase in learning and improving itsscience research and innovation capabilities. According to Thomson Reuters (2011), India managed to produce 2,83,664 research publicationsfor the last 10 years. In 2012, India ranks 9th scientific publications with a global share of 3.5%, predominantly chemistry publications which forms the largest share (6.5%) of world research output. Innovation is defined asthe application of knowledge in a novel way, primarily for economic benefit (Economist, 2009).In the Global Innovation Index (GII),India ranks at No. 1in the region of Central and Southern Asia; it has been consistently ranked among thetop ten in the category of lower-middle-income economies over last 5 years.

Table 3 GII ranking of India

Index	**2009**	**2010**	**2011**	**2012**	**2013**	**Average Ranking**
Global Innovation Index	41	56	62	64	66	57.8
Innovation Input Sub-index	49	54	87	96	87	74.6
Innovation Output Sub-index	34	69	44	40	42	45.8

Table 3 shows Indian innovation in the global context during 2009-13. TheGII consists of input (institutions, human capital and research, infrastructure, market sophistication and business sophistication) and output sub-indices (knowledge and technology and creative outputs). The global ranking of India was a simple average of the input and output sub-indices. On an average Indian input sub-index ranking was 74.6 whereas output sub-index rank was 45.8 in the world over last five years.

9. STRATEGIES FOR PATENTING

Inventors and investors are often busy in producing patents that are unique, valuable and worldwidemarketable. But for the promotion and protection of the patents, and to enhance patenting system in India and abroada few strategies are needed. These include

- An amicable eco-system (academic and research culture, resources, infrastructure, incentives, collaboration, expertise, discourses etc.) for creativity and innovation.
- Prior art search, an important element to reveal/review existing research literature.
- Creating awareness of traditional and publicly available knowledge which cannot be patented.
- Patent filing or provisionalpatent filing.
- Drafting claims (defined precisely based on scope, characteristics and structure) or disclosures that help others to exploit invention.
- Ensuring patent proliferation, policies and protection to avoid confrontation and infringement by the patent trolls
- Evaluation of quality of patents to avoid in patent absurdity and piling of inconsequential patents
- Assured economic viability and societal value of the patent
- Collaboration among individuals, institutes, and industries in creation of innovative spirit and promotion of patents
- Encouragement of open innovation
- Reverse innovation (Dartmouth) to encourage low-cost goods.

However, the culture of patenting in India is slowly growing and needs to be speeded up. It needs a strong IPR mandate for building patenting system in India for the creation and generation of products, employment, income and wealth.

10. CONCLUSION

Over centuries, India is known for rich history, culture and heritage of scientific and traditional knowledge. In recent days, Indiahas played a key role in stimulating research and innovation capabilities in multiple sectors andencouraging the IPR activities. No doubt, India earns huge revenues through IPR but also follows stringent rules protect creativity or innovation. As a result, total number of patents granted in India was 69,745 over the last 10 years with a rejection rate of77.94% of patent applications which is high when compared to China, Japan, Korea and Twain. It indicates that India has stringent patenting system, policies and enforcement system to protect IPR laws. States where Patent Offices are located, industries, academic and research institutes have shown considerable role in producing patents. Over last decade, streams like chemical and mechanical engineering were given high priority in producing patents than the fields of bio-technology and food. However, India has shown considerable increase in learning and improving science research and innovation capabilities at domestic and global levels.Further, creativity and innovation act as a business discipline in the Indian educational system to generate sustainable growth and development.

REFERENCES

1. CGPDTM (2008). Manual of patent practice and procedure the patent office, India. Controller General of Patents, Designs & Trade Marks, India. Retrieved from http://ipindia.nic.in/ipr/ patent/Patent_Manual_Feedback/WO_Ga_34_China.pdf

2. Cornell University, INSEAD & WIPO (2013). Global Innovation Index (GII): the local dynamics of innovation. Author. Retrieved from http://www.wipo.int/econ_stat/ en/economics/gii/

3. Economist Intelligence Unit Limited (2009).A new ranking of the world's most innovative countries. Retrieved from http://graphics.eiu.com/PDF/Cisco_Innovation _Methodology.pdf

4. EPO (2009). India's Traditional Knowledge Digital Library (TKDL): A powerful tool for patent examiners. European Patent Office. Author. Retrieved fromhttp://www.tkdl.res.in/tkdl/TKDL_CSIR/pressrelease/press%20images/www.epo.org _topics_issues_traditional.html.pdf

5. European Patent Office (EPO). Author. Retrieved from http://www.epo.org/searching/ asian/trends.html

6. Falvey, Rod and Foster, Neil (2006). The role of intellectual property rights in technology transfer and economic growth: theory and evidence, Vienna: UNIDO. Retrieved from

http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Role_of_intellectual_property_rights_in_technology_transfer_and_economic_growth.pdf

7. Giacopello, Fabio (2012). Rise in quantity, fall in quality: Assessing China's patent filings. Intellectual Property Magazine, 63-64. Retrieved from http://www.hfgip.com/downloads/ 201212001.pdf

8. Govt. of India. Annual Report of Controller General of Patents, Designs & Trade Marks (CGPDTM). Author. Retrieved from http://www.ipindia.nic.in/

9. Hoorebeek, Mark Van (2005). Law, libraries and technology, Oxford, OX: Chandos Publishing (p. 83)

10. INSA (2001). Engineering and technical education. In. Pursuit and promotion of science (pp). New Delhi: Indian National Science Academy. http://www.iisc.ernet.in/insa/

11. Jishnu, Latha (2014 March 16-28). Patently absurd: patently hollow claims of the US. Down to Earth, 51.

12. Kshitij, Avinash& Joshi, Kirti (2012 January25).Patent portfolio in terms of geographic distribution. Current Science, 102(2), 157.

13. Kumari, S. &Raghunatha Reddy, D. (2006). Intellectual Property Rights Management and Its Growing Importance in Diversified Field of Technology in Context of Developing Countries. The Chartered Accountant. 725-732. Retrieved from http://www.icaiejournal.org/Journal/1353_ 2006_11.pdf

14. Lucchi, Nicola (2005). Intellectual property rights in digital media: a comparative analysis of legal protection, technological measures, and new business models under EU and U.S. law.Buffalo Law Review, 53(4),102-183.

15. Prud'homme, Dan (2012). A statistical analysis of China's patent quality situation and larger innovation ecosystem. Munich Personal RePEc Archive (MPRA), (Paper No. 51619). Retrieved from http://mpra.ub.uni-muenchen.de/51619/

16. Soini, S., Ayme S., &Matthijs, G. (2008).Patenting and licensing in genetic testing: ethical, legal and social issues. Eur J Hum Genet, 16, S10–S50.

17. Stevens, William K.(1982, November 9). India, once a giant in science, tries to rekindle the creative fire. The New York Times.http://www.nytimes.com/ 982/11/09/ science/india-once-a-giant-in-science-tries-to-rekindle-the-creative-fire.html?pagewanted=1

18. Thomson Reuters (2011)Evidence report of Thomson Reuters2011. Retrieved from http://thomsonreuters.com/

19. Ware, Mark & Michael Mabe (2009). The STM report: An overview of scientific and scholarly journal publishing,Oxford, OX: STM: International Association of Scientific, Technical and Medical Publishers. Retrieved 21 February 2014, from http://www.stm-assoc.org/ 2009_10_13_MWC_STM_Report.pdf

20. WIPO (2013). 2013 World Intellectual Property Indicators. WIPO Economics & Statistics Series. (Publication No. 941E/2013). Geneva: WIPO Publication. WIPO. Retrieved from http://www. wipo.int/ipstats/en/wipi/index.html

21. World Intellectual Property Organization. (2008). The concept of intellectual property. In W. I.P Organization, WIPO Intellectual Property Handbook: Policy, Law and Use (2nd Edition ed., pp. 3-6). Geneva: WIPO Publication.