

RESEARCH

An empirical study on India's progress in intellectual property rights with reference to patent filing and grants in the emerging technological era

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India is a country of versatility, diverse culture, and complex social dimensions. India has been a country of agriculture, and even in today's era, the majority of the population relies on agriculture for their livelihood; however, despite all these facts, India has seen a tremendous growth and change in economy, science and technology, education, and so on. In the process of development, invention and innovation have gained immense importance, which have resulted in application of inventions and innovations in the form of technology. In this background, the legal protection for the inventors arises, which is being catered by intellectual property rights (IPR) in the whole world as well as India. In Indian context, the IPR has not yet reached every business organization because the word IPR has always been misunderstood by most of the people that it is meant only for science and scientific inventions, but the fact is IPR's applicability is much wider and it is applicable even to the smallest businesses. In the entire world, China is a nation which has the highest number of IPR grants, followed by USA. IPR in the present situation is very prominent and relevant because changes in industries like telecommunication, computer science, and so on are in the frontline and India is not lagging in invention and innovations. In 2021, out of the total number of applications received, China has the major contribution, which amounts to 40%. But very shockingly, India is not even in the top 10, which hints us that India needs to be vigilant and needs more attention of IPR. This research article speaks on how India is progressing in applicability of IPR and why India is not extensively using the provisions of IPR. We all know that IPR includes various elements like patents, copyrights, and trademarks; geographical indicators; industrial design; and utility models. But to be more precise and detailed, we have narrowed down our study only to patents in India, and even in that, we have considered patent applications, patent grants, and patents in force. It is to be noted that India's economy is vibrant and dynamic. An economy like India is truly in need of extensive use of IPR and its provision to protect the rights of the real owner and inventor. But most of the population is ignorant about the IPR, so we are making an attempt to understand what is India's position in IPR and its applicability. To narrow down our research, we have confined our study to only patents. In a further study, we can analyze how we can improve the awareness, and it may also help us in updating of IPR laws and its provisions.

Keywords: IPR, patent, trademark, industrial design, copyright, trade secrets

Introduction

The world has been evolving in various dimensions, in terms of business, technology, politics, environment system,

culture, and so on. These changes have created an ever changing or dynamic environment. In this context, the business environment and science and technology are no exceptions. As we all know that India has been

a country of agriculture, but of late industrialization, urbanization revolutionized the whole economy and it brought phenomenal transformation in economic, social, and technological environments.

In this light, science and technology have always been in the forefront of society in implementing changes and transformations. So the changes in technology, inventions, and innovations are all being considerably applied commercially. So in this situation, protection of the rights of the original inventor becomes necessary, and he has to be offered a legal environment, which motivates the inventors to invent more and they are paid well and recognize their hard work, skills, persistence, and so on. The architect and engineer Filippo Brunelleschi received the earliest known patent for an industrial invention in Florence in 1421. The patent granted him a 3-year monopoly on the production of a marble-transporting barge with hoisting equipment. It is this situation which speaks about Intellectual Property Rights (IPR) and the relevance. Any ideas which originate from the intelligence can be termed as intellect, and why is it termed as property? It is because just like any other physical property or an asset, the intellect can also be used for prosperity and growth. IPR have different types, such as patents, trademark, industrial design, copyrights, trade secrets, and geographical indicators. We have already discussed that IPR have six types, including patents, trademark, industrial design, copyrights, and trade secrets. And each one of these things is meant for a specific creative skill to be rewarded and be used commercially. In the prevailing research article, we focus on patents in India.

Patents

An innovation is an item or a method that, generally speaking, proposes a new technical approach to a problem or a new way of accomplishing something. An innovation is granted an exclusive privilege known as a patent. In order to get a patent, technical information on the innovation must be made available in the application.

Trademark

A trademark is a design that may be used to distinguish one company's goods or services from those of other businesses. Trademarks are protected by IPR.

Industrial designs

Legally speaking, an industrial design refers to a product's ornamental element. A three-dimensional element like an object's geometry may be present in an industrial design in addition to two-dimensional components like patterns, lines, or colors.

Copyright

The ownership rights that authors and other artists have over their creative works are referred to by the legal term "copyright," which is sometimes referred to as "author's right."

In addition to books, music, paintings, sculptures, and films, copyright also protects computer programs, databases, advertisements, maps, and technical drawings.

Trade secrets

Trade secrets are protected by IPR that can be licensed or sold. If they have commercial value and are only known by a select few, the legitimate owner of the information must take reasonable measures to keep it a secret, including using confidentiality agreements with clients and staff. Additionally, it is considered an unfair conduct and a breach of the trade secret protection when third parties unlawfully obtain, utilize, or disclose such secret information in a way that is inconsistent with honest business practices.

Geographical indicators

An item with a specific geographic origin and traits or a reputation arising from that origin is labeled with a geographical indication (GI). A sign must state that a product is created in a certain region in order to qualify as a GI¹.

Background of the study

Intelligence is an element of the brain which can be termed as intellect, but when such intelligence can be commercially used, it certainly needs a protection that a third party does not exploit the invention. Though the term IPR sounds modern and latest, the concept of IPR was first used in 6th century BCE in ancient Greece in a place called Sybaris. It was a baker who gained an exclusive right of raising a quality of bread for a year. Some of the sources also state that the origin of IPR was in the year 1421, where an Italian inventor was granted a patent. Even in Indian context, the history can be traced to Harappa Civilization, where pottery makers were given trademark for their intelligence.

The Latin term "Patene," which means "To Open," is the source of the English word "Patent." A patent is a legal document that is granted by the state or national government in accordance with local and international laws. For a specific time, it grants the maker only the right to produce, utilize, and commercialize his or her work. The invention

¹ <https://www.wipo.int/portal/en/>

will be regarded as belonging exclusively to the patentee. Any other source may not use the inventor's inventions throughout the patent's validity period. In the context of India, patents may be traced back to the VI Act of 1856, which protected inventions based on the British Patent Law of 1852 and awarded 14 years of exclusive privileges to creators of new products. Periodically, this Act was updated, and the most recent revision was made in 2005 by the Patents Amendments Act.

Review of literature

1. In the paper of P. Varsha Pramod and Dr. Remya Ramachandran in the article titled Innovation, Intellectual Property Rights And Entrepreneurship ISSN:0971-1260 Vol-22-Issue-4-October-December-2019, the relationship between innovation and entrepreneurship in general and the significance of IPR in entrepreneurship are discussed, which go beyond only defending the rights of the inventor. However, it demonstrates how the government is working to establish a dynamic IPR environment through a number of initiatives. The article specifically assists aspiring business owners in getting a general understanding of issues that will enable them to benefit from IPR.
2. According to Amit Kapoor and Sankalp Sharma in an article, the common people has just lately become aware of IPR. The protection of industrial property and copyright, which boosts the nation's economy, requires a full grasp of IPR. The whole infrastructure was given by the Indian government. Software, traditional knowledge, plant varieties, and geographical indicators are all protected in particular ways. The identification, planning, execution, and preservation of innovation are made quicker and simpler with the aid of a good grasp of IPR.
3. According to an article by Lengare (1), titled Importance of intellectual property rights in Indian situation, IPR are crucial for the long-term growth of society in a knowledge-based economy. Since it is almost difficult to foster a creative atmosphere without widely distributing IPR understanding and application, the IPR is a fundamental requirement to participate in local as well as worldwide fair exchange. It is crucial for policymakers to integrate IPR within the framework of basic education and to support IPR recognition by empowering developers and innovators. India possesses all the necessary resources, including cheap labor, imaginative and creative workers, and raw materials. There is no doubt that India and other developing nations will increase their proportionate part of global trade by pursuing IPR.
4. In an article by Tiwari et al. (2), Management of intellectual property rights in India, the World Trade

Organization's agreement on trade-related aspects of IPR established international minimum standards for intellectual property protection, significantly enhancing and expanding IPR and producing glaring benefits for the pharmaceutical industry and the developed world. The current study thoroughly explains all facets of IPR as well as the standards for their protection.

5. In an article authored by Tulasi and Rao, (3) these inventions are referred to as property since they have a high commercial value.
6. As per BananaIP (4) IPR statistics report 2021 A total of 67,727 patent applications were examined in 2021 as opposed to 70,924 patent applications examined in 2020. The Patent Offices granted 30,431 patents in 2021 compared to 26,309 in 2020 chalking in an increase of 15.66%. In 2021, China had the most patent grants worldwide with 695,946 patents granted to resident and non-resident companies or organizations. The United States followed with 327,307 granted patents the same year.
7. As per Economic Times (5) report during January-March 2022 quarter, the total number of patents filed stood at 19,796. Out of these, 10,706 were filed by Indian applicants while non-Indian applicants filed 9,090 patent applications.

Patents can be used to protect inventions as intellectual property as long as they are new, original, and practical. The World Trade Organization proposed the TRIPS agreement in order to facilitate trade among its members. India took the required first step by joining the World Trade Organization and adapting to the needs of the world.

The purpose of this article is to inform pharmaceutical professionals, in particular those working in research and development, about the importance of thoroughly reviewing prior art before designing new inventions in order to save time and money. Detailing the history, current regulatory organizations and their functions, and the Act protecting the patent system allows for full knowledge.

Research focus

From the above reviews, we can understand that many researchers have tried to understand the intellectual properties in Indian context in their own dimensions such as the relevance, growth, importance in today's economic situation, and how we manage the intangible properties, but in this article, we are trying to focus on a decade, that is, between 2010 and 2020, how many applications have been filed and how many have been grants and how many are in force, if we understand that it will help us in assessing the rate at which the patents are being granted to Indian inventors.

Scope of the study

The area of intellectual properties is wide and vast because the phase in which the global economy is growing is rapid and dynamic; automatically, the Indian economy is also under the same pressure of survival, so in such a dynamic environment, the business organizations are in strong need of protecting their business ideas and trade secrets so that the real inventor of the idea is given a privilege of being the sole owner of the business idea or invention. In the IPR, there are elements like patents, copyrights, trademarks, industrial designs, geographical indicators, and trade secrets. We have restricted our study only to the patent filing and grants and patents in force in India. The data have been fetched from the World Intellectual Property organization data center, and an effort is made to understand the rate in which the applications are being filed and the rate in which patents are granted.

Objectives

1. To understand and assess the status of India in IPR in terms of patent filing and grants.
2. To understand the progress of India in IPR, especially in patents.
3. To assess the growth rate of patent filing and grants to Indian inventors.

Statement of the problem

Intellectual properties are the emerging intangible properties which have evolved as the most important assets of business organizations as well as the country; in this context, India has made a significant growth in the filing for the IPR and grants, so in this background, India's progress in the rate in which patent applications are filed and granted is assessed. Let us understand the phase at which Indian IPR with respect to patents are being filed and granted between 2010 and 2020.

Research design

The present study is a quantitative study and based purely on secondary data which are collected from the data published by the World Intellectual Property Rights Organization website. The data collected are arranged in tabular form, and to have an easy understanding of the trend, the data have been plotted on a graph. Primarily, there are empirical studies to assess the trend and progress of India's patent filing and grants from 2010 to 2020.

We have not used any specific statistical tools for data analysis, except the tabular forms of data which are plotted on

TABLE 1 | (Data source: WIPO IP Statistic data center) Total patent applications filed.

Year	Resident applications	Non-resident applications	Total
2010	8,853	30,909	39,762
2011	8,841	33,450	42,291
2012	9,553	34,402	43,955
2013	10,669	32,362	43,031
2014	12,040	30,814	42,854
2015	12,579	33,079	45,658
2016	13,199	31,858	45,057
2017	14,961	31,621	46,582
2018	16,289	33,766	50,055
2019	19,454	34,173	53,627
2020	23,141	33,630	56,771

<https://www3.wipo.int/ipstats/IpsStatsResultvalue>

Resident application: An application submitted to an IP office by a party located in the nation or territory within the jurisdiction of that office.

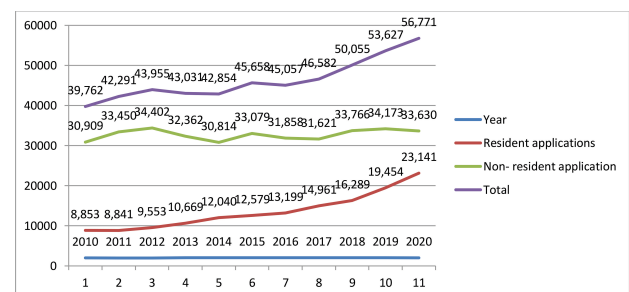
Non-resident Application: An application submitted by an applicant resident in another nation or jurisdiction to the patent office of that country or jurisdiction.

a graph using MS Excel, and based on this, data are analyzed and followed by interpretation.

Data analysis and interpretation

The graph clearly depicts the rate of applications being filed, and every year, there is an approximate increment in the number of applications being filed; that is, there is an exponential growth in the number of applications. It also shows that India is vibrantly involved in inventions and innovations.

From **Table 1**, we can understand that the total number of applications filed in 2010–2020 is 509,643, out of which 149,579 are resident applications and 360,064 are non-resident. If it is averaged, every year, India has been filing 46,331 applications.



Total number applications filed	509,643
Total Number of resident applications	149,579
Total number of Non-resident applications	360,064
Average number of applications	46,331
Monthly average	3860
Daily average	129

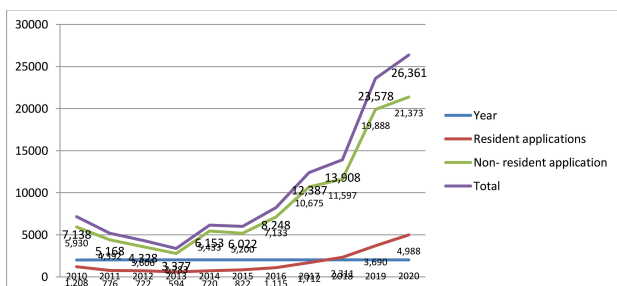
TABLE 2 | Total number of patent grants.

Year	Resident applications	Non-resident applications	Total
2010	1,208	5,930	7,138
2011	776	4,392	5,168
2012	722	3,606	4,328
2013	594	2,783	3,377
2014	720	5,433	6,153
2015	822	5,200	6,022
2016	1,115	7,133	8,248
2017	1,712	10,675	12,387
2018	2,311	11,597	13,908
2019	3,690	19,888	23,578
2020	4,988	21,373	26,361

<https://www3.wipo.int/ipstats/IpsStatsResultvalue>

In the period of 2010–2020, the total number of applications filed is 509,643 and the total number of patents granted is 111,668, which means approximately the ratio between application filing and grant is 5:1. Similarly, 10,606 patents are granted against 46,331, **Table 2.**

Table 3 and graphs show the comparison of the number of patents granted and the number of applications filed along with the percentage. In the span of 2010–2020, India has recorded 21.62% of patents granted every year. The highest of patents are granted in the year with 26,361, which amounts to 46.43% in the year 2020, whereas the lowest is 3377, which amounts to 7.84% in the year 2013.



Total number of patents granted	116,668
Total number of patents granted to non-resident applicants	98,010
Total number of patents granted to resident applicants	18,658
Average patents granted per year:	10,606
Monthly average	883.83
	(approximately 884)
Everyday approximately	29 patents are granted.

It also has to be observed that in the 4 years of time from 2017 to 2020, India has recorded a drastic hike in the patents with an average of 36.04%, which is a very positive sign.

TABLE 3 | Comparison between total number of applications filed and patents granted.

Year	Applications filed	Patents granted	Percentage
2010	39,762	7,138	17.95%
2011	42,291	5,168	12.22%
2012	43,955	4,328	9.84%
2013	43,031	3,377	7.84%
2014	42,854	6,153	14.35%
2015	45,658	6,022	13.18%
2016	45,057	8,248	18.30%
2017	46,582	12,387	26.59%
2018	50,055	13,908	27.78%
2019	53,627	23,578	43.39%
2020	56,771	26,361	46.43%

Total number of patents in force: 613,734

Total number of patents in force applied by resident applicants: 102,046

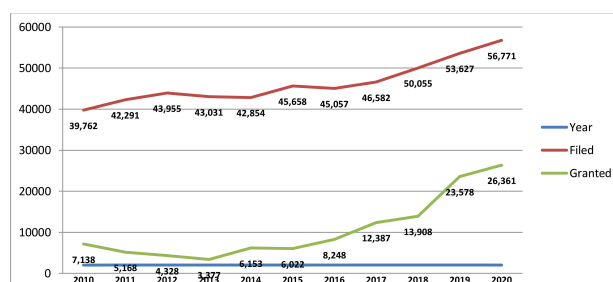
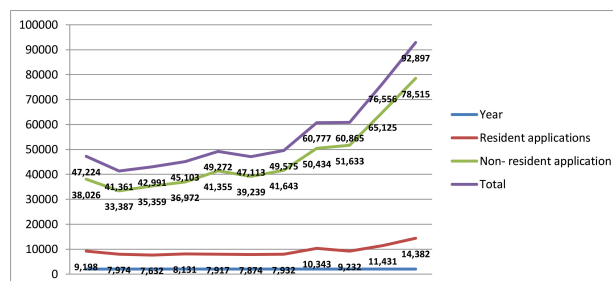


TABLE 4 | Patents in force.

Year	Resident applications	Non-resident applications	Total
2010	9,198	38,026	47,224
2011	7,974	33,387	41,361
2012	7,632	35,359	42,991
2013	8,131	36,972	45,103
2014	7,917	41,355	49,272
2015	7,874	39,239	47,113
2016	7,932	41,643	49,575
2017	10,343	50,434	60,777
2018	9,232	51,633	60,865
2019	11,431	65,125	76,556
2020	14,382	78,515	92,897

<https://www3.wipo.int/ipstats/IpsStatsResultvalue>



Total number of patents in force applied by non-residents: 511,688

Average number of patents in force per year: 55,794, Table 4.

Findings

- (1) The general observation is that there is a significant growth in the patent filing and grants.
- (2) It can be observed that the average increase in patent applications being filed grows at the rate of 1500–1800 from 2010 to 2016, but from 2017 to 2020, there is steep growth in the number of applications; to be more precise, there are around 10,000 applications filed in those years.
- (3) On an average, 10,606 patents are granted every year; a monthly average of 883 and daily 29 patents are granted.
- (4) At the end of 2020, India has recorded 613,734 patents in force, and in the period of 2017–2020, that is, in 4 years, 291,095 patents are in force.
- (5) The average of 2016–2020 is 72,773, which is the highest in the whole decade.
- (6) The comparison between patent applications filed and patents granted shows the highest in 2019 and 2020, with 23,578 patents granted against 53,627 applications, which amounts to 43.39%.
- (7) Similarly, in the year 2020, totally, 26,361 patents are granted against 56,771 applications, with 46.43%, and by the year 2021, it has crossed 50%.

Conclusion

India has been developing in patent filing and grants phenomenally in the tenure of 2010–2020, with 92,897

patents in force, which is considerably a good record. It is due to the initiatives taken by the government like 10% rebate on small organizations, educational institutions, and so on. If the same pace is continued, by 2030, India will have around 2 lakh patents, which is good to Indian standards, but if it is compared with those of China and USA, India is not even closer because China has registered whopping 530,137 patents and in USA, 351,993 patents are granted in the year 2020 alone; further, China adds 14% extra grants every year. India stands in the seventh position in patent grants in the year 2020, with 26,361 patents. We all know that India is emerging as one of the leading economies of the world, and developing technologies are in the forefront and these technologies are in need of legal protection; in that sense, IPR helps the inventors, business men, and economy. We can say that India is progressive in patent filing and patent grants, and it follows its own pace, but it is certainly not on par with China and USA, which needs to be looked into by the Government, research institutes, scientists, academicians, and educational institutes so that if an overall coordination is ensured, certainly Indian patent progression can be matched with China and USA.

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