

Trends in the Indian Patent Scenario: A Meta-Analysis

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Abstract

This trend analysis delves into the landscape of Indian patents from 2012 to 2022, aiming to identify and evaluate significant trends and changes in innovation. The primary objectives of this research include discerning patenting patterns, exploring innovative domains, assessing the impacts of legislative modifications, and projecting future developments. Through a comprehensive analysis of patent data, it seeks to ascertain prevalent technological domains, key influencing factors, and India's competitive standing within the global innovation landscape. The report underscores sector-specific patenting trends, placing emphasis on the emergence of new industries such as artificial intelligence, renewable energy, pharmaceuticals, and telecommunications. It illuminates India's evolving research and development objectives by scrutinizing patent filing rates, trends in technical collaborations, and the country's participation in the global arena. Additionally, it considers how changes in policy frameworks and regulations may influence patent activities. Our findings reveal a substantial increase in patent applications across various industries, with notable surges observed in technology, pharmaceuticals, and renewable energy sectors. Notably, this analysis underscores the necessity for continual policy support and increased investments in research and development to harness the full potential of Indian innovation. This comprehensive analysis provides strategic insights into

future innovation trajectories, contributing to a nuanced understanding of India's patent landscape over the past decade.

Key words: Indian patents, innovation trends, patenting patterns

Introduction

In the context of the modern interconnected global economy, the importance of intellectual property rights is paramount. A key objective outlined by the Indian government for sustainable development is the promotion of innovation. The National Intellectual Property Rights (IPR) Policy aspires to create an environment where intellectual property drives creativity and innovation for the collective benefit of society. Various government initiatives such as Make in India, Start-up India, Digital India, and Skill India have effectively demonstrated their capability to foster innovation. The Atal Innovation Mission plays a pivotal role in nurturing innovation within educational institutions across the nation. Aligned with the IPR policy, the Office of the Controller General of Patents, Designs, and Trademarks has entrusted CI-PAM, the cell for IPR Promotion and Management, with the responsibility of facilitating the establishment and commercialization of intellectual property assets. Notably, there has been a significant rise in the number of filings for intellectual property rights, prompting a capacity-building transformation within the Intellectual

Property Offices. This transformation includes an increased number of Examiners who have received specialized training in patents. Since October 2013, the Patent Office has functioned as an international searching and examining authority, and the growing preference of more applicants choosing the IPO for global search is a positive indication (1). The provision of Expedited Examination as a service for applicants registered as start-ups and choosing the Indian Patent Office for their international application is a commendable development. Moreover, the establishment of a specialized Quality Assurance Division within the Patent Office ensures quality in all operational aspects. Patents serve as a significant source of original and pioneering technical knowledge. The volume of patents originating from a country is a reliable indicator of its technological prowess and competitiveness. Analyzing patent trends aids in forecasting technology trajectories and shaping policy decisions effectively (2).

The primary aim here is to conduct in-depth research into the current patenting landscape in India, specifically through an examination of Indian patent trends spanning from 2012 to 2022. This comprehensive trend analysis method identifies and evaluates patenting patterns, unveiling crucial elements, predominant technological domains, and India's competitive position within the global innovation industry. This analysis not only aids in devising innovative approaches to obtain patents but also helps in understanding the reasons behind patent refusals. Top of Form

Materials and Methods

The study's methodological framework aimed to scrutinize trends and patterns in patent applications spanning diverse invention categories

from 2012 to 2022, along with identifying the contributing factors to patent rejections. The information used for this study was sourced from the official Intellectual Property website of India. The comprehensive analysis involved an examination of the total count of patent applications filed, examined, granted, and those either disposed of or denied, which were sourced from the annual reports published by the Intellectual Property Office (IPO). These reports can be accessed at <https://ipindia.gov.in/annual-reports-ipo.htm>(3). All patents issued by the IPO during the years 2012 to 2022 conformed to the established inclusion criteria (3). A record sheet was meticulously structured to compile and organize the primary data obtained. The record sheet was created using Microsoft Office Word 2022, and subsequently, the data were imported into Microsoft Office Excel 2022 for comprehensive analysis and further processing. The compiled record sheet provides a comprehensive overview of patent filing and examination trends in various fields of invention from 2012 to 2022, including the total number of patents filed, examined, disposed of or granted, and granted across different fields. The collected data were methodically organized, entered into the Microsoft Office Excel 2022 program, and underwent a rigorous statistical analysis to draw conclusive insights.

Results and Discussion

This study reviewed, examined, and resolved all Indian patent applications filed from 2012 to 2022. The results are presented in Table 1 and Graph 1. Tables 2 and 3 provide a detailed breakdown of the data, offering insights into the evolving landscape of patent acquisition in India. These tables are valuable resources for researchers, policymakers, and industry stakeholders.

Table 1: Scenario of Indian patents from 2012-2022

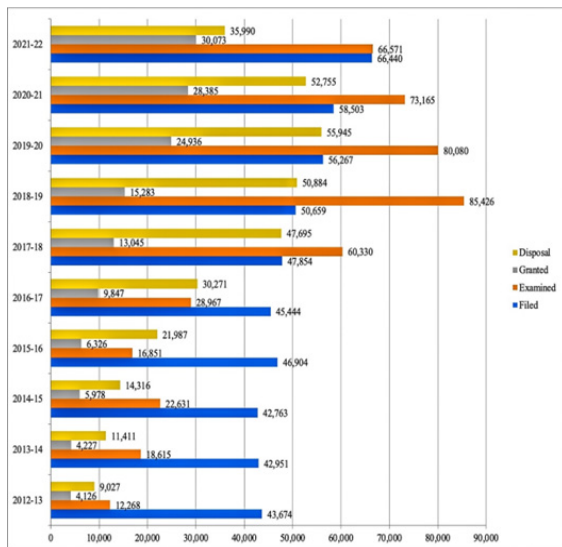
| Year | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Filed | 43,674 | 42,951 | 42,763 | 46,904 | 45,444 | 47,854 | 50,659 | 56,267 | 58,503 | 66,440 |
| Examined | 12,268 | 18,615 | 22,631 | 16,851 | 28,967 | 60,330 | 85,426 | 80,080 | 73,165 | 66,571 |
| Granted | 4,126 | 4,227 | 5,978 | 6,326 | 9,847 | 13,045 | 15,283 | 24,936 | 28,385 | 30,073 |
| Disposal | 9,027 | 11,411 | 14,316 | 21,987 | 30,271 | 47,695 | 50,884 | 55,945 | 52,755 | 35,990 |

Table 2: Number of patent applications filed from 2012-2022 under major fields of invention (14)(15).

| YEAR | CHEMICAL | PS | PS&T | CS&E | COMMUNICATION | ELECTRICAL | PHYSICS | BIO-MEDICAL | ME | OTHERS | TOTAL |
|-----------|----------|------|------|-------|---------------|------------|---------|-------------|-------|--------|-------|
| 2012-2013 | 6812 | 2954 | 1425 | 4424 | 4163 | 3568 | 2593 | 1053 | 10198 | 6484 | 43674 |
| 2013-2014 | 6769 | 2507 | 1050 | 4410 | 4039 | 4371 | 2230 | 612 | 11318 | 5645 | 42951 |
| 2014-2015 | 6454 | 2640 | 1059 | 4285 | 4380 | 4031 | 2529 | 1669 | 10031 | 5685 | 42763 |
| 2015-2016 | 6463 | 2966 | 1230 | 5988 | 5770 | 4102 | 2852 | 1579 | 10164 | 5790 | 46904 |
| 2016-2017 | 5911 | 2122 | 1158 | 6443 | 5315 | 4141 | 2693 | 1048 | 10715 | 5898 | 45444 |
| 2017-2018 | 6343 | 2741 | 1116 | 6089 | 5486 | 4278 | 2996 | 1095 | 11573 | 6137 | 47854 |
| 2018-2019 | 6560 | 2683 | 1100 | 5540 | 6308 | 4703 | 3659 | 812 | 12414 | 6880 | 50659 |
| 2019-2020 | 5198 | 5622 | 1309 | 11126 | 6862 | 4587 | 2646 | 3508 | 10359 | 5050 | 56267 |
| 2020-2021 | 8809 | 80 | 1508 | 11930 | 6660 | 3743 | 2842 | 4911 | 10540 | 7480 | 58503 |
| 2021-2022 | 5173 | 5179 | 858 | 15575 | 7314 | 4286 | 3007 | 5288 | 11969 | 7791 | 66440 |

Table 3: Number of patent applications granted from 2012-2022 under major fields of invention (16)(17).

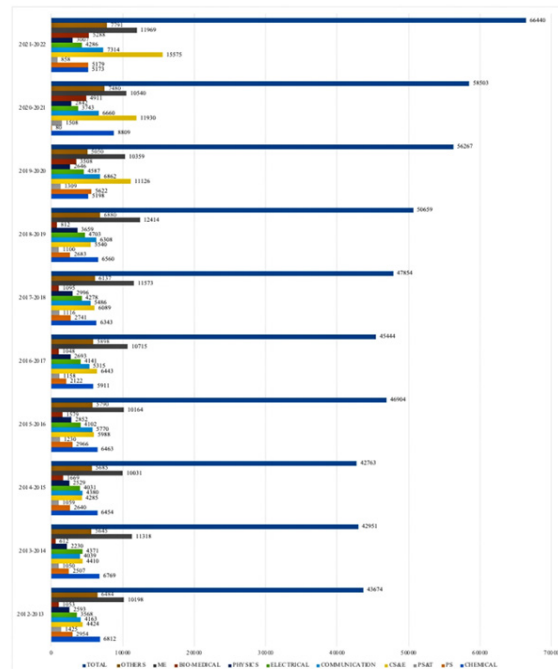
| YEAR | CHEMICAL | PS | PS&T | CS&E | COMMUNICATION | ELECTRICAL | PHYSICS | BIO-MEDICAL | ME | OTHERS | TOTAL |
|-----------|----------|------|------|------|---------------|------------|---------|-------------|------|--------|-------|
| 2012-2013 | 1289 | 344 | 169 | 510 | 273 | 188 | 65 | 0 | 749 | 539 | 4126 |
| 2013-2014 | 1111 | 256 | 165 | 690 | 375 | 237 | 109 | 0 | 645 | 638 | 4226 |
| 2014-2015 | 1533 | 389 | 295 | 835 | 538 | 376 | 142 | 0 | 1047 | 823 | 5978 |
| 2015-2016 | 1683 | 370 | 279 | 810 | 414 | 362 | 175 | 0 | 1414 | 819 | 6326 |
| 2016-2017 | 2673 | 551 | 562 | 1049 | 805 | 579 | 260 | 0 | 1939 | 1429 | 9847 |
| 2017-2018 | 3376 | 733 | 747 | 1028 | 1031 | 818 | 568 | 150 | 2514 | 2080 | 13045 |
| 2018-2019 | 4242 | 761 | 701 | 1074 | 1414 | 1253 | 703 | 290 | 2857 | 1988 | 15283 |
| 2019-2020 | 4848 | 1930 | 923 | 2141 | 2692 | 2451 | 1349 | 565 | 5301 | 2736 | 24936 |
| 2020-2021 | 6074 | 1264 | 1745 | 2049 | 2857 | 2637 | 1396 | 703 | 6348 | 3312 | 28385 |
| 2021-2022 | 4279 | 3317 | 893 | 2459 | 3238 | 3084 | 1609 | 982 | 6832 | 3380 | 30073 |



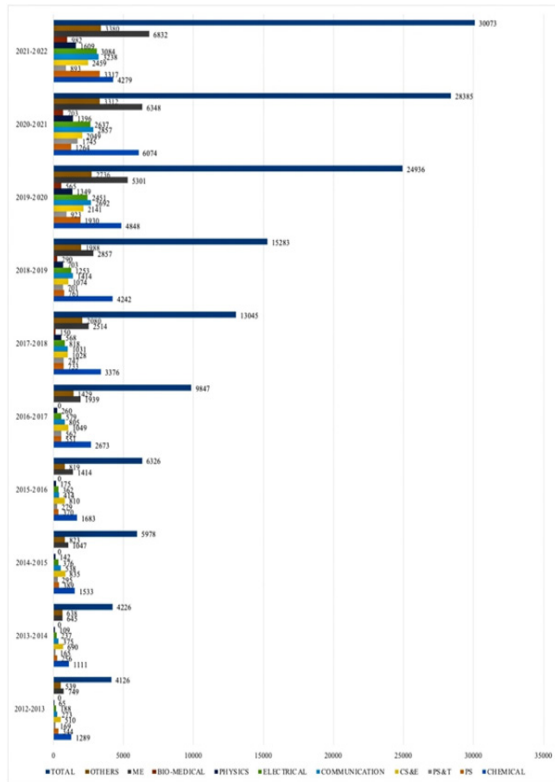
Graph 1: Patent trends in India during 2012-2022

Graphs 2 and 3 provide a comprehensive overview of the patenting landscape in India over the last decade, shedding light on distinctive trends in patent filings and grants across various fields of invention (Graph 2 and Graph 3). The total number of patents filed and granted

under 2012-2022 are represented as pie charts with the percentages (Fig 1 and Fig 2).



Graph 2: Patent applications filed under major fields of invention from 2012-2022



Graph 3: Patent applications granted under major fields of invention from 2012-2022

Throughout the analysed period, mechanical engineering consistently emerged as the frontrunner in terms of the number of patents filed. Concurrently, the field of chemicals secured the highest count of patents granted (4-13). This established a clear dichotomy in the dynamics of patent acquisition, with mechanical engineering dominating in filings and the chemical domain excelling in actual grants. A notable inflection point surfaced in the Fiscal year 2019-20. Despite mechanical engineering maintaining its stronghold on the highest number of patents granted, the landscape of filings underwent a remarkable shift. The forefront transitioned to the dynamic realms of computer science and electronics, signifying a significant pivot in innovation trends (11).

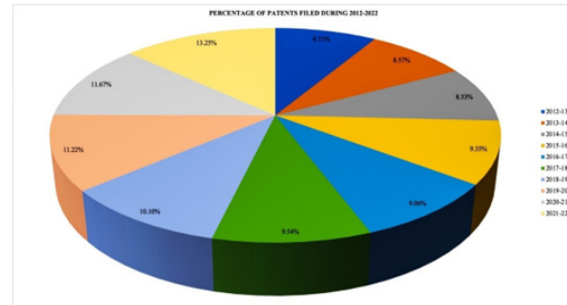


Figure 1: Percentage of patents filed from 2012-2022

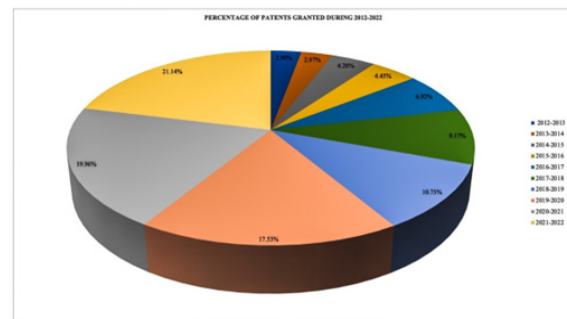


Figure 2: Percentage of patents granted from 2012-2022

The percentage growth of patent filings from 2012 to 2022 revealed a fluctuating yet overall ascending trend in submissions: 43,674 patent applications in 2012–2013 showcased a marginal 1.1% increase from the prior year (4), while 42,951 applications in 2013–14 saw a slight 1.65% decrease (5). Subsequent years witnessed varied patterns: 42,763 filings in 2014–15 with a modest decline (6), a surge to 46,904 applications in 2015–2016, marking an increase of nearly 10% from the previous year (7). The two-year period from 2016 to 2017 experienced a minor decrease to 45,444 patent applications, demonstrating a 3.2% decline. Notably, the domestic filing percentage saw a rise to 29.2% in 2016–17, indicating a 1.2% increase (8). The following years displayed a positive trajectory with increasing submissions: 47,854 in 2017–18 (a 5.3% increase) (9), 50,659 in 2018–2019 (a 5.9% rise) (10), 56,279 in 2019–2020 (an 11.1% increase) (11), 58,503 in 2020–2021

(a 3.97% rise) (12), and 66,440 in 2021–2022, marking a substantial increase of 13.57% from the preceding year (13). Moreover, there were notable elevations in the percentage of domestically filed patent applications, indicating an increasing trend over the years.

This trend analysis not only provides insights into the current patenting landscape in India but also serves as a valuable tool for understanding the diverse areas of dominance in patent acquisition across different fields of invention. For instance, the surge in computer science and electronics filings could guide strategic considerations for those seeking patents in cutting-edge technologies.

The analysis encompassed an extensive evaluation of Indian patents from 2012 to 2022, revealing significant trends and variations in the patenting landscape. The study involved an examination of patent applications, grant rates, and their distribution across multiple fields of invention.

Across the ten-year period, the observed percentage growth of patents filed depicted varying trends. Notably, the number of patent applications exhibited fluctuations year-on-year, with occasional rises and declines in the filing rates. These statistics highlight the changing dynamics of innovation and patent submissions within India.

The trend analysis underscored the evolving patenting patterns, shedding light on the prevailing dominance in specific fields of invention. This insight is crucial in understanding the sectors garnering the most patent activity and serves as a strategic guide for emerging areas that require focus for increased patent acquisition. This comprehensive study not only delineates the prevailing patent trends but also presents a roadmap for identifying fields with significant potential for enhanced patent acquisition.

Conclusion

The comprehensive analysis of patent trends offers valuable insights into the landscape of patent application filings, innovation trajectories, and the diverse patenting endeavour's across multiple inventive sectors in India. This study indicates a noticeable upsurge in patent activity over the years, signifying a growing interest in patenting activities across various fields. The fluctuating trends in patenting activity underscore the dynamic nature of innovation in different invention categories, culminating in the issuance of patents. It's apparent that while there is a notable number of patent applications, only a fraction of these are successfully granted, while the remainder face rejection for various reasons. Reasons for patent rejections encompass aspects such as lack of innovation, issues related to inventive steps, failure to disclose biological material sources, and inadequacies in providing a detailed innovation description. Additionally, the consideration of prior community experiences, whether local or indigenous, plays a significant role in the patent rejection process.

References

1. Indian patent office, vision and mission, <https://ipindia.gov.in/vision-patent.htm>
2. Sanjay V. Jadhav, Kailas R. Jagdeo. (2020). Recent Patenting Trends in India-A Critical Study. *International Journal of Creative Research Thoughts*; 8(4):469-75.
3. IPR Annual Reports, <https://ipindia.gov.in/annual-reports-ipo.htm>
4. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2012-2013), pp.5
5. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2013-2014), pp.5
6. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2014-2015), pp.6

7. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2015-2016), pp.5
8. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2016-2017), pp.10
9. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2017-2018), pp.7
10. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2018-2019), pp.7
11. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2019-2020), pp.6
12. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2020-2021), pp.6
13. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2021-2022), pp.6
14. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2016-2017), pp.46
15. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2021-2022), pp.37
16. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2016-2017), pp.47
17. Office of the Controller General of Patents, Designs & Trade Marks. Annual report (2021-2022), pp.38