
STRATEGIC INTEGRATION OF INTELLECTUAL PROPERTY IN EARLY-STAGE ENTREPRENEURSHIP: ANALYSING POLICY-PRACTICE GAPS AND INSTITUTIONAL FRAMEWORKS IN INDIA

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ABSTRACT

Intellectual property (IP) is a crucial tool for fostering entrepreneurship in knowledge-based economies, but there are still significant obstacles to helping early-stage entrepreneurs understand IP frameworks and use them. Although India has the National IPR Policy (2016) and initiatives such as Startup India and CIPAM, empirical data show that IP awareness and use among startups and MSMEs remain extremely low, as is the case in many jurisdictions globally. The paper critically analyses the policy and institutional gaps influencing IP capacity-building among earlystage entrepreneurs in India, placing the domestic initiatives in the international comparative context. The research employs a qualitative approach based on the analysis of IP policies and institutional reports, as well as secondary data from WIPO, EUIPO, USPTO, and national materials, and topped with case study examples. The results indicate an extensive policy-practice gap: the progressive changes do not come to fruition through effective adoption, which is constrained by accessibility, cost, and institutional factors. The paper advocates an integrated roadmap of bringing together awareness, institutional strengthening, as well as financing mechanisms to incorporate IP as a strategic resource of sustainable entrepreneurial innovation.

Keywords: Intellectual Property Rights (IPR), Startups, SMEs, Capacity Building, Innovation Ecosystem.

1) INTRODUCTION

Intellectual Property Rights (IPRs) are therefore the most important in the middle of a contemporary innovation economy, where they provide the mechanism by which creators, inventors, and entrepreneurs can protect and use their intellectual property. The Indian scene witnessed a concerted effort to facilitate the development of a structured IP regime with the introduction of the National IPR Policy of 2016, which provided a comprehensive vision for encouraging innovation, creativity, and entrepreneurship in line with best practices worldwide. Before this, the Indian IP situation was quite fragmented and indirect; therefore, the appearance of such a policy certainly provided a shot in the arm to the current Indian IP regime: it was an indication of renewed Indian intentions to more closely align itself with the global innovation regime¹. The Manual of Patent Office Practice and Procedure, published by the Office of the Controller General of Patents, Designs and Trade Marks (CGPDTM), is one of the pillars of India's IP Regime. The guide is used by examiners, practitioners, and applicants alike to promote the administration of patent law in line with the principles of parity and transparency. These reports, when combined, also reveal trends and statistics on filings, pendency's, and sector growth, which, in turn, are paramount to the functioning of the country's IP system².

The Government also supports initiatives that directly advance innovation in strategic segments. In this respect, the program Support for International Patent Protection in Electronics and Information Technology (SIP-EIT) assists the Indian innovators in registering patents in foreign markets in the electronics and information technology sector, therefore, connecting local innovation to the global market. StartUp India, in complement, envisages IPR benefits for new ventures, such as ease of filing, lower costs, and instilling in startups the perception of IP as a strategic business-level asset.³

Conversely, the Cell for IP Promotion and Management (CIPAM) has developed IP awareness courses in schools and other institutions of higher learning to integrate IP into academic

¹ Timothy Mulumba, *Intellectual Property Rights: Protecting Innovation in the Modern Era*, 23 J. INT'L BUS. RES. 1 (2024).

² *Manual of Patent Office Practice and Procedure* (Version 01.11, modified Mar. 22, 2011) (Office of the Controller Gen. of Patents, Designs & Trademarks, India).

³ Support for International Patent Protection in Electronics and Information Technology (SIP-EIT), ClearTax (Apr., 2025), <https://cleartax.in/s/support-international-patent-protection-electronics-information-technology-sip-eit>.

institutions and enlighten the upcoming generations of innovators⁴. These efforts note that inculcating IP awareness at a young age will be important in transcending cultural and economic change in the future. Using a macroeconomic measurement, India is ranked on its capacity to innovate at both the international and local levels. The India Innovation Index, published by NITI Aayog, also analyses the performance of states and union territories in innovation and thus identifies gaps in governance, human capital, and industry connectedness. Similarly, the Department of Science and Technology's Science, Technology and Innovation Policy (STIP) emphasise the importance of IP in research-based sustainable development⁵.

On the international front, the IP ecosystem in India is further supported. As an illustration, the Technology and Innovation Support Centres (TISC) network offers access to patent databases, with support services available to innovators, as well as resources and specialised services in technology-related matters; this is a collaboration between DPIIT and the WIPO. Specifically, they are valuable centres that can facilitate access to IP knowledge to SMEs and individual innovators, as they are often not supported by the institutions⁶.

Besides, NITI Aayog, through the Atal Innovation Mission, has initiated Atal Incubation Centres across the country to provide infrastructure, technical, and legal support to startups. These centres also mentor them on IPRs to foster the perception that effective IP management is a critical component of entrepreneurial success. Due to the cumulative impact of these efforts, India has come a long way in cultivating an environment in which innovation and IP protection are increasingly seen as two engines of sustainable growth⁷.

Historically, India's IP action might have started with compliance with TRIPS in the 1990s and culminated in a proactive stance, as shown by the National IPR Policy in 2016. Although in previous decades IP protection could still be viewed as an international issue, the current stage views IP as a developmental instrument. One reason India has trailed behind in this regard is that nations such as China registered more than 1.5 million patents in 2021, compared

⁴ Cell for IPR Promotion and Management (CIPAM), About CIPAM, CIPAM (last visited Feb. 10, 2026), <https://cipam.gov.in/en/about/cipam>.

⁵ NITI Aayog, *India Innovation Index 2020* (2021), <https://niti.gov.in/sites/default/files/202101/IndiaInnovationReport2020Book.pdf>.

⁶ World Intellectual Property Organization (WIPO), *Technology and Innovation Support Centers (TISC)*, <https://www.wipo.int/en/web/tisc> (last visited Feb. 10, 2026).

⁷ India, *Atal Innovation Mission Hosts AIM SUMVAAD, India's Flagship Conclave for the National Incubation Ecosystem*, Press Information Bureau, Government of India (Feb. 3, 2026), <https://www.pib.gov.in/PressReleaseDetail.aspx?PRID=2222724®=6&lang=1>.

with about 60,000 in India. This gap represents a fast-developing ecosystem in India where the entrepreneurial foundation has yet to embrace IP as a direct catalyst for its development⁸.

This ecosystem positions end-user entrepreneurs favourably. India has become the third-largest startup hub in the world, having more than 100,000 listed startups under DPIIT (2023). According to surveys on IP registration, there is a worrying disparity in registrations: less than 1 out of every 10 enterprises has applied to register IP⁹. It is this gap between recognition and registration to which the stronger emphasis of policy is appealed. Without IP literacy and access becoming part of the entrepreneurial culture, many of these enterprises will be outcompeted or otherwise outplayed by larger, more resourceful businesses.

The entrepreneurial awareness of IP is not limited to legal protection worldwide but is increasingly seen as a growth avenue. The United States Small Business Administration is deliberately establishing the connection between IP protection and venture capital development, and the spinoff model of university-based spin-off is endeavouring to establish the connection between patenting and ideation in Israel¹⁰. By contrast, the Indian ecosystem has taken some commendable measures but has yet to implement any organised inculcation of IP into financing, incubation, and educational lines. It is the disconnection that this paper starts with.

Therefore, the introduction of policy reforms, institutional support mechanisms, and education programs can be counted among the proofs that India is no longer in the transition phase of the IP regime based on compliance, it has transitioned to an innovation-driven regime¹¹. The solutions to the glitches of enforcement, awareness, and accessibility are yet to go a long way, though the avenues offered by these frameworks can help find a way to integrate IP into the very basis of development within India.

2) LITERATURE REVIEW

The intellectual property has been widely addressed across various platforms, e.g., policy

⁸ K.M. Gopakumar, *National IPR Policy: A Reality Check*, THIRD WORLD NETWORK (June 5, 2016), <http://www.deccanherald.com/content/550549/national-ipr-policy-reality-check.html>.

⁹ PIB, *Startup India Has Evolved into a Defining Movement* at *India Shipping News* (noting over two lakh DPIIT recognised startups), 16 Jan. 2026.

¹⁰ Ignacio De León & José Fernández, *Innovation, Startups and Intellectual Property Management* (Springer 2017) DOI:10.1007/978-3-319-54906-4.

¹¹ *University News*, Vol. 59, No. 15, April 12–18, 2021 (Ass'n of Indian Universities).

documents, journals, literature, and organisational reports, to mention but a few, with references mostly on SMEs and startups. In the context of India, a number of institutional frameworks have been established to support innovation and overcome barriers to the scientific research/commercialisation of technology¹². The Biotechnology Industry Research Assistance Council (BIRAC), which works under the Department of Biotechnology, has been instrumental in promoting bio-entrepreneurship. Its BioNEST and Startup India incubation policy notes the attention of IP considerations and the transfer of technology to early-stage biotech startups¹. These programs demonstrate policies, on a sector-by-sector basis, that can restore the enabling ecosystem for IP-based development, particularly in knowledge sectors¹³.

The MSME Ministry recognises the critical role IP can play in enhancing the competitiveness of small businesses. The Ministry has sought to institutionalise measures to support SMEs in the proceedings for preparing IP registrations and enforcement through IPFCs, in the legal, financial, and procedural respects. These centres aim to reduce transaction costs associated with securing intangibles by placing IP services closer to entrepreneurs, thereby prompting firms to consider IP as part of their general business processes¹⁴.

Compared globally, India's general benchmark is set by international indexes and reports. An example of the most popular national metric for assessing the innovation system is the Global Innovation Index, published annually by Cornell University, INSEAD, and the World Intellectual Property Organisation (WIPO)¹⁵. The fact that this index has steadily increased in India over the last decade bears testament to the perception of alarming policy changes, the rising intellectual understanding of IP, and the enhancement of institutional capacity. Nevertheless, this index also indicates that there is still an inherent problem with the transformation of the input of innovation into its output, which manifests as structural bottlenecks in IP commercialisation and enforcement¹⁶.

¹² Zulkifli Makkawaru, Yulia Yulia & Almusawir Almusawir, *The Impact of Intellectual Property Law on Startups and SMEs: A Systematic Review*, 5 J. Posthumanism 5 (2025), <https://doi.org/10.63332/joph.v5i5.1823>.

¹³ BIRAC–BioNEST, *Biotechnology Industry Research Assistance Council* (last visited Feb. 10, 2026), <https://birac.nic.in/bionest.php>.

¹⁴ *Intellectual Property Right Scheme Under MSME Innovative Scheme, myScheme* (Government of India), <https://www.myscheme.gov.in/schemes/ipr> (last visited Feb. 9, 2026).

¹⁵ Global Innovation Index (GII) 2023, Gokulam Seek IAS Academy (Sept. 30, 2023), <https://gokulamseekias.com/prelims-c-a/science-technology/global-innovation-index-gii-2023/>.

¹⁶ V. Anantha Nageswaran & Gulzar Natarajan, *Can India Grow? Challenges, Opportunities, and the Way Forward* (Nov. 16, 2016), Carnegie Endowment for Int'l Peace,

The reflection on such an account is compiled by the World Intellectual Property Report, which provides an international perspective on how intellectual property impacts innovation, industrial transformation, and economic growth cycles. When India is placed in the context of these world forces, it provides policy analysts and scholars with some understanding of how domestic policy operates in light of international trends, with trade, technology transfer and digitisation at the centre stage¹⁷. In addition to the detailed guides of WIPO provided to SMEs that enable them to bridge the resource gap or specialists' knowledge gap to navigate the most challenging IP systems, the help of the manager of intellectual property is also identified to indicate that obtaining patent protection can assist smaller companies to defend their inventions, find investors, and create a competitive advantage¹⁸. This reminds us of the general observation that SMEs, regardless of size, play a role in technological advancement and financial sustainability.

The WIPO trademark guide for SMEs also demonstrates how brand protection can help build market awareness and gain consumer trust. Trademarks cost a minimum to SMEs that are strapped for resources and need to establish their foothold in the market and introduce product differentiation. With a secure brand identity, SMEs will be assured to venture into domestic and other markets, thus minimising the risk of unfair competition from imitative products and services¹⁹. Enhanced above the patent and trademark, design protection has been noted as one of the most significant options available to SMEs. The WIPO guide on industrial design makes a significant point: industrial designs discriminate and direct products to customers. Design rights enable countries to enjoy aesthetic novelty, which is often the prime success factor in consumer preferences, particularly in textile, consumer goods, and technical peripheral industries²⁰. In a broader perspective on the types of IP, *From Ideas to Assets: Making IP Work for Business* highlights the long-overdue focus on IP systematisation in connection with business strategies. According to the report, SMEs must cease to regard IP as a mere formality

<https://carnegieendowment.org/research/2016/11/can-indiagrow-challenges-opportunities-and-the-way-forward> [https://perma.cc/XXXX-XXXX].

¹⁷ S.K. Verma & N.V. Muralidhar Rao, *WIPO–UNU Joint Research Project: Impact of the Intellectual Property System on Economic Growth—Fact-Finding Surveys and Analysis in the Asian Region: Country Report—India* (World Intell. Prop. Org. & United Nations Univ., n.d.).

¹⁸ Christopher T. Lohrey & Kelvin W. Willoughby, *Intellectual Property and SMEs: What's the State of Play?*, WORLD PAT. INFO. (2025), <https://doi.org/10.1016/j.wpi.2025.102401>.

¹⁹ Bao Tran, *WIPO Trademark Statistics: A Comprehensive Overview*, World Intell. Prop. Org. (Feb. 9, 2026), <https://patentpc.com/blog/wipo-trademark-statistics-a-comprehensive-overview>.

²⁰ World Intellectual Property Organization, *Why Industrial Designs Matter to SMEs*, WIPO (last visited Feb. 10, 2026), <https://www.wipo.int/en/web/business/designs>.

in the eyes of the law and begin to view it as a comprehensive strategic tool that will assist firms in obtaining funding, entering joint ventures, and pursuing globalisation. This shift in interest is particularly pertinent to new economies where entrepreneurial ecosystems are rapidly expanding but not sufficiently developed to utilise intangible assets to the full²¹.

The introductory guides also emphasise raising awareness and providing access to learning materials. *Making a Mark: An Introduction to Trademarks for SMEs* provides the foundational knowledge on brand recognition for business development. It is the complex legal material that has been captured in the book and framed as familiar case studies, enabling small businesses the freedom and information to make informed choices about brand strategy and protection. *Creating an Invention: An Introduction to Patents in SMEs* is also similar, presenting the patent law system, so even the most brilliant innovator who knows nothing about the law can use it meaningfully²². All these constitute a substantial body of literature that demonstrates the overlap between policy and institutional structures and the ground-level direction on how SMEs and startups should develop their intellectual property environments. The reports and guides highlight the necessity of legal protection and also the integration of IP management into strategic business practice²³. The convergence of policy and practice is another indication that the significance of IP is not merely an extra item to put in the compliance box, but a means that can be very fruitful in achieving competitiveness, innovation, and economic viability in the long term.

In addition to the sector-specific interventions already mentioned, there is a valuable body of literature that illuminates the problems involving IP and finance. According to research conducted by the European Patent Office (EPO) in 2021, startups that hold registered patents or trademarks are three times more likely to attract a venture capitalist firm than those that do not. Within the Indian context, however, investors are barely considering IP portfolios as an element warranting significant valuation because of ineffective enforcement systems and a

²¹ Ignacio De León & José Fernández, *The Impact of IP Risk in the Development of IP Markets*, in INNOVATION, STARTUPS AND INTELLECTUAL PROPERTY MANAGEMENT 97, 97–110 (2017), https://doi.org/10.1007/978-3-319-54906-4_6.

²² WIPO, *Making a Mark: An Introduction to Trademarks for Small and Medium-Sized Enterprises* 2 (2013), <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-900-1-en-making-a-mark-an-introduction-to-trademarks-for-small-and-medium-sized-enterprises.pdf>.

²³ Christopher Lohrey & Kelvin Wayne Willoughby, *Intellectual Property and SMEs: What's the State of Play?*, 83 World Pat. Info. 102401 (2025), <https://doi.org/10.1016/j.wpi.2025.102401>.

lack of an applicable valuation system for assets²⁴. Therefore, it creates a vicious circle because a financier does not recognise the importance of IP to the entrepreneur.

Another strand of literature stresses the topicality relating to digital IP awareness. With ever-increasing dependence on software, data, and other algorithms, in reality, a majority of the startups today find themselves in intangible-heavy domains. The OECD's reports of 2022 suggest that digital startups can face an asymmetry of threats concerning IP, which can range from unauthorized use of source code to outright piracy of digital content. However, policies for digital IP in India are quite fragmented, as the subject matter is often considered under data protection or cybersecurity rather than being part of IP law²⁵. This thus puts forth a strong argument for the amalgamation of digital governance and IP architecture.

Comparative experiences from the Global South complement the discussion better. Brazil's INPI has experimented with advisory cells designed locally, whereby IP consultants are embedded within regional innovation hubs. South Africa has married government R&D grants with a compulsory IP disclosure regime, thereby generating a culture of protection right at the start²⁶. The realization, therefore, is that one must never treat IP awareness as just an isolated legal literacy issue; rather, it must be consciously integrated alongside financial incentives, educational structures, and regulatory compliance.

All said and done, the literature supports a consensus view that SMEs and startups, despite constituting the core model of innovative economies, remain ill-served by traditional IP regimes; hence, India's challenge is not merely confined to the design of policies but extends to ensuring their penetration, adoption, and long-term integration into entrepreneurial strategies.

3) CORE ANALYSIS

3.1 Another Perspective: The Expanding Role of International IP Guidance

²⁴ European Patent Office & European Union Intellectual Property Office, *Startups with Patents and Trade Marks Are 10 Times More Successful in Securing Funding, New Study Finds* (Oct. 17, 2023), <https://www.epo.org/en/news-events/press-centre/press-release/2023/945253>.

²⁵ Stryszowski, P. and D. Scorpecci (2009), *Piracy of Digital Content*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264065437-en>.

²⁶ BRICS Law Journal, ISSN 2412-2343 (Online), ISSN 2409-9058 (Print), registered with the Federal Service for Supervision of Legislation in Mass Communications and Cultural Heritage Protection (Russ.), Reg. No. FS77-69105 (Mar. 14, 2017)

The IP has emerged to be increasingly viewed as one of the pillars of innovation-based economies. Nevertheless, for early-stage entrepreneurs and SMEs, negotiating IP systems is daunting due to their high cost, complex procedures, and limited knowledge. To close in on this disparity, the World Intellectual Property Organisation (WIPO) has developed an extensive range of SMEfriendly manuals that aim to balance the legal complexities in business approaches. Its most significant contribution is Intellectual Property for Business: Patents - A Guide to Small and Medium-Sized Enterprises, which is written not about patents as legal safeguards, but about them as value-creating tools and signals in the market²⁷. WIPO is business-based and thus aims for a holistic business approach, presenting patents as instruments that can attract investment, promote partnering, and enhance competitive positioning. This view is especially beneficial for startup companies, which tend to view patents as redundancies rather than assets with a longer life. Intellectual Property for Business: Trademarks and Designs - A Guide to SMEs touches on trademarks, the first IP right to be secured by a new business²⁸. WIPO points out that trademarks serve as a medium for brand communication, customer loyalty, and reputational capital. Trademark registration is comparatively cheap and less complex than patent registration, and it is therefore particularly useful to resource-limited entrepreneurs. Trademarks in a market setting where imitation is rapid become especially important for differentiation. The other type of IP that is not widely used is industrial designs, which is highlighted in the WIPO Designs Guide for SMEs. In consumer-oriented industries like fashion, electronics and furniture, design protection guarantees aesthetic novelty and provides a competitive edge. WIPO demonstrates that a blend of IP rights can enable SMEs across industries by focusing on more than just patents and trademarks. These understandings find nexus in From Ideas to Assets: Making IP Work for Business, an effort that advances the view that IP ought to be a business model pillar rather than a delay²⁹. IP is introduced as a mediator between creativity and commercialisation, enabling startups to use intangibles not only for protection but also as bargaining resources with investors, partners, and financiers. The incorporated vision rebrands IP as an agent of sustainable entrepreneurship.

²⁷ Jeremy de Beer ed., *Implementing the World Intellectual Property Organization's Development Agenda* (Wilfrid Laurier Univ. Press in assoc. with CIGI & IDRC 2009).

²⁸ Anthony Trippe, *Guidelines for Preparing Patent Landscape Reports*, WIPO Pub. No. 946E (2015), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_946.pdf.

²⁹ Doris Schartinger & Michael Barber, *Firms' Intellectual Property Protection with National Versus European Design Rights: A Count Model*, 130 *Scientometrics* 8 (2025), <https://doi.org/10.1007/s11192-025-05351-w>.

3.2 Building Awareness and Enhancing Educational Capacity

One unresolved policy gap in IP ecosystems is a lack of awareness. Most startups do not safeguard their innovations simply because the risks of imitation have not been adequately assessed or because they are not knowledgeable about existing IP mechanisms³⁰. Trying to fill this gap, making a Mark: An Introduction to Trademarks in SMEs by WIPO aims to introduce the concepts of IP in a way understandable to SMEs, using practical examples. The guide enables greater entrepreneurial involvement by framing IP as an entrepreneurial choice rather than an obligatory part of the law. In a similar manner, *Inventing the Future: An Introduction to Patents for SMEs* explores the mysteries of patents and explains them in chronological order, outlining the process and its economic advantages. Opportunity cost: While the perception of patents as prohibitively expensive and time-consuming persists, WIPO restructures patents as investments in credibility, scalability, and growth. Examples are used to show how SMEs have utilised patents to raise venture capital and venture into international markets. In its publication, WIPO also highlights the use of IP in international trade in its publication, *Secrets of Intellectual Property: A Guide to Small and Medium-Sized Exporters*³¹. The guide highlights how IP rights reduce counterfeiting and other unauthorised uses in overseas markets. Such protection is crucial to the global competitiveness of export-oriented startups in developing economies, where domestic enforcement may be weak. This underscores the need for a capacity-building program that enables firms to operate under international IP regimes. With the realisation of the limitations of conventional outreach practices, WIPO has significantly expanded its online learning programs³². IP PANORAMA: E-learning Modules for SMEs offers interactive, multimedia-oriented content that provides information for entrepreneurs. These modules are free and self-paced, making IP education more democratic and less dependent on poorly distributed physical training. Such projects in an age of digital interaction can be seen as a starting point for IP capacity-building³³.

³⁰ Jan Krauss, Lore Breitenbach-Koller & David Kutenkeuler, *Intellectual Property Rights and Their Role in the Start-Up Bioeconomy – A Success Story?*, 4 BIOECONOMY ____ (2021), <https://doi.org/10.1016/j.bioeco.2021.100002>.

³¹ World Intellectual Property Organization, *Inventing the Future: An Introduction to Patents for Small and Medium-Sized Enterprises* 3 (2018), https://www.wipo.int/export/sites/www/sme/en/documents/guides/customization/inventing_future_pa.pdf

³² Organisation for Economic Co-operation and Development, *The Economic Impact of Counterfeiting and Piracy* (OECD Publishing 2008), https://www.oecd.org/content/dam/oecd/en/publications/reports/2008/06/the-economic-impact-of-counterfeiting-and-piracy_g1gh906c/9789264045521-en.pdf.

³³ World Intellectual Prop. Org., *IP PANORAMA: The Most Advanced E-Learning Content on Intellectual Property for Your Business*, <https://www.wipo.int/ip-panorama/en/> (last visited Feb. 10, 2026).

3.3 Building of Institutional Frameworks.

Educational programs cannot positively change the situation without local and sustained support mechanisms in the form of institutions. The WIPO Technology and Innovation Support Centres (TISC) Program Evaluation provides a clear empirical picture of the effectiveness of such structures. TISCs also reduce barriers to entry of innovators by providing access to patent databases, expert help, and training services. Assessment indicates an elevated rate of IP filing, ease of commercialising research, and robust international connections for innovation between the beneficiaries³⁴. This underscores the importance of combining awareness-building and institutional support to transfer knowledge into practice. Universities and state-owned research institutions are also increasingly important channels for spreading IP culture. IP Management in Universities and Public Research Organisations by WIPO describes the systems for setting up technology transfer offices, licensing, and joint research models³⁵. This is a paradigm shift in the Indian context, as universities have long resisted commercialisation and have placed greater emphasis on teaching. Systematic IP management can be embedded in higher education to foster innovation, inculcate entrepreneurial attitudes, and develop the utmost creativity among students and scholars³⁶.

3.4 European Regional Comparisons

Although WIPO provides global structures, regional institutions offer important guidance on implementing IP principles. According to the Intellectual Property SME Scoreboard (2023) by the EUIPO, there is a growing understanding of IP among European SMEs, but barriers remain regarding the costs and the complexity of the administrative procedures. These results closely resemble the Indian situation, whose policy programs raise awareness but do not lead to corresponding adoption, resulting in a continuing perception-practice gap. The IP-Intensive Industries and Economic Performance in the EU report by the joint EUIPO-EPO provides

³⁴ Vaidehi Kabra, *Establishment of Technology and Innovative Support Centers in India*, Khurana & Khurana (Sept. 12, 2019), <https://www.khuranaandkhurana.com/2019/09/12/establishment-of-technology-and-innovative-supportcenters-in-india>.

³⁵ Stanley Kowalski, *Establishing Appropriate Best Practices in Intellectual Property Management and Technology Transfer in the United Arab Emirates: Building Human Capital, Global Networks and Institutional Infrastructure to Drive Sustainable Knowledge-Based, Innovation-Driven Development*, UNIV. OF N.H. SCHOLARS' REPOSITORY (2019), https://scholars.unh.edu/law_facpub/###.

³⁶ Upinder Dhar & Santosh Dhar, *Innovation as an Antecedent of the Universities of the Future*, in REIMAGINING INDIAN UNIVERSITIES 267, 267–73 (Pankaj Mittal & Sistla Rama Devi Pani eds., Ass'n of Indian Univs. 2020).

macroeconomic data on the importance of IP, showing that IP-intensive industries play a disproportionately important role in GDP, job creation, and exports. This enhances IP education as an economic argument for mainstreaming IP education in entrepreneurial ecosystems and aligns IP policy with other development goals³⁷. This is further refined by the EPO study, *High-Growth Firms and Intellectual Property Rights*, which finds a strong association between strong IP portfolios and high-growth paths for startups and SMEs. Companies with patents or trademarks have better survival rates, access to venture capital, and greater internationalisation diversity, which confirms IP as a business accelerator rather than a purely legal tool. New technology industries give further light. *Deep Tech Innovation and Startups: Patent Insights* report states that biotechnology, artificial intelligence, and advanced materials are sectors that depend heavily on patents due to long-distance commercialisation and expensive research and development³⁸. In nascent deep-tech ecosystems such as India's, the European experience shapes IP's contribution to high-risk, high-reward innovation.

3.5 Gaps in Policy and Strategic Lessons

Compile these resources, and one will learn about developments and still-existing gaps in the worldwide and national IP systems. The WIPO's education and institutional structures have achieved titanic leaps to democratise knowledge and access to IP; they have also recognised the economic value of actual IP incorporation, so they offer some precedents for incorporating IP into mainstream innovation systems³⁹. Despite these achievements, they leave some gaps in translating awareness into practice.

The biggest challenges that small-scale businessmen face are financial limitations, administrative barriers, and the absence of localised advice. Such consciousness-raising exercises as WIPO SME guides and digital learning modules instil valuable knowledge that can, at best, prepare for structural obstacles such as high filing fees, ineffective enforcement, or cultural beliefs about IP as weak. European statistics also indicate that, despite high

³⁷ European Union Intellectual Property Office, *2022 Intellectual Property SME Scoreboard* (Sept. 2022), https://euipo.europa.eu/tunnelweb/secure/webdav/guest/document_library/observatory/documents/IP_sme_scoreboard_study_2022/IP_sme_scoreboard_study_2022_en.pdf (ISBN 978-92-9156-324-1; DOI 10.2814/28513).

³⁸ European Patent Office & European Union Intellectual Property Office, *High-Growth Firms and Intellectual Property Rights: IPR Profile of High-Potential SMEs in Europe* (May 2019).

³⁹ Susanne Lundin, Charlotte Kroløkke, Marianne N. Petersen & Elmi Müller eds., *Global Bodies in Grey Zones: Health, Hope, Biotechnology* (SUN MeDIA Stellenbosch 2016), <https://www.jstor.org/stable/j.ctv1nzg0w3>.

economic power, adoption rates are uneven, suggesting that knowledge may not necessarily translate into action⁴⁰. The results in the Indian context, hence, pose a follow-up demand for two means: first, the further cultivation of awareness through the available educational sections shall be pursued. Second, the establishment and consolidation of institutional and monetary support systems will be done with the perception that they will literally exert downward pressure on these tangible obstacles to IP adoption. Experiences of the TISCs and the European innovation ecosystems show that awareness cannot be directed in a way that results in actual entrepreneurial outcomes without a sound and competent institutional framework on which it can be directed⁴¹. Moreover, connecting IP protection to access to financing mechanisms, whether venture capital or government programs, could be a further incentive for startups to adopt them. At some point, intellectual property must be viewed not simply as a compliance issue but also as an asset which is part of the entrepreneurial culture⁴². It is this re-packaging that should be accorded to early-stage entrepreneurs, more so in developing economies: that innovation should be given meaningful articulation in sustainable business generation and, consequently, economic development on a broader scale.

4) CASE STUDIES:

This section is an example of what has occurred in the Indian innovation ecosystem, both positive and negative, to increase IP awareness and strategic use and the provisions of the institution to ensure that the entrepreneur can better leverage IP.

4.1. Academic Institutions and Generation of IP.

An initial case study comparing a central university and an Institute of Eminence in India reveals that there are gross differences in IP generation, with much more IP assets, such as patents and registered IP, being generated at the premier institutions. This difference actually demonstrates that the IP output and commercialisation capacity can be predetermined by

⁴⁰ OECD, *OECD SME and Entrepreneurship Outlook 2023* 27 (2023), OECD Publishing, Paris, <https://doi.org/10.1787/342b8564-en>.

⁴¹ Sam Hill & Thomas Chalaux, *Improving Access and Quality in the Indian Education System*, OECD Econ. Dep't Working Papers No. 885 (2011), <https://dx.doi.org/10.1787/5kg83k687ng7-en>.

⁴² Vaibhav Srivastava & Tamanna Pandey, *The Role of Intellectual Property Right in the Success and Growth of Startups*, Intellectual Property Rights (Sept. 13, 2024), <https://articles.manupatra.com/article-details/The-Role-of-Intellectual-Property-Right-in-the-Success-and-Growth-of-Startups> .

institutional policy, research culture and resource availability⁴³.

4.2. University Incubators as Brokers.

IIT Kanpur has one of the top institutes for entrepreneurship, the Incubation Centre. The analysis of the incubator demonstrates that it offers technology, IP direction, legal counselling, and a commercialisation path, including intermediate seed funding for policy navigation. This highlights the importance of well-financed incubators in imparting IP awareness to start-ups at the time of recruitment⁴⁴.

4.3. Startup Success Stories Cashing in on IP.

The example of some renowned Indian startups that have developed IP awareness into a competitive advantage illustrates how the concept has evolved into a competitive edge. Indicatively, Flipkart has a relatively large number of patents on backend logistics algorithms and interface design, and as such, it is able to create a technological moat around its venture in the burgeoning e-commerce industry in India. Similarly, the original trademarking of their name, logo, and colour scheme has enabled Zomato to aggressively protect its goodwill in the market as an entry-level firm amid intense competition⁴⁵.

4.4. IP licensing and commercialisation in Small-scale enterprises.

An instructive case study in the MSME sector is the story of the design of a Matrix Heat Recovery Unit (MHRU) invented by the physician Dr Milind Rane. Rane sold the design to a small manufacturer under a royalty arrangement, thereby generating a steady stream of revenue and building goodwill to commercialise further innovation. This underscores how IP can be converted by even smaller holders into sustainable economic outcomes in a process

⁴³ Inst. of Company Secretaries of India, *Study Material on Setting Up of Business Entities & Limited Liability Partnership* (PDF), https://www.icsi.edu/media/webmodules/SBI%26LL_with_cover.pdf (last visited Feb. __, 2026).

⁴⁴ Information & Media Outreach Cell, IIT Kanpur, *IIT Kanpur's Start-up Incubation and Innovation Centre Showcases Cutting-Edge Start-ups Revolutionizing Key Sectors* (Nov. 11, 2024).

⁴⁵ Shri Vijay Manohar Tiwari et al., *Development of India through Business & Industries* (Makhanlal Caturvedi National University of Journalism and Communication 2025), <https://www.mcu.ac.in/Publication/E-Books/e-bookdevelopment-of-india-through-business-and-Industries.pdf>.

called entrepreneurial licensing⁴⁶.

4.5. Institutional IP Management in Agricultural Research

The IP management and commercialisation of the Vivekananda Institute of Hill Agriculture (VPKAS) have yielded returns that are measurable. High-altitude agricultural technologies have been systematically patented by researchers with commercialisation deals in mind, and it is in this way that concerted institutional actions aligned with governmental research can promote innovation adoption in niche spheres⁴⁷.

4.6. Strategic IP as a Legal Shield: Domain Name Dispute.

The case, Satyam Infoway Ltd. v. Sifynet Solutions Pvt. Ltd, itself a landmark Supreme Court case, ruled that domain names could be protected under trademark law. The ruling added the much needed clarity and a reference point for entrepreneurs to defend against duplicates, and strengthened the broader point that protection of IP was not limited to patents and trademarks⁴⁸.

4.7. Pandemic-Era Project-Based Learning and Innovation.

During the pandemic, the method evolves with the main idea of facilitating cognitive activities, collaboration and teamwork. An online STEM initiative, launched during the first phase of the COVID-19 pandemic, continues to exist and is designed to help students develop socially convincing innovations through project-based learning. Although it is not necessarily IP-related, it emphasises early exposure to innovation and IP thinking in the practice of developing long-term entrepreneurial skills⁴⁹.

4.8. Technology Transfer Models:

International Lessons. The comparative models used in the USA, Japan, and Israel assume

⁴⁶ Commercialization of an Invention before the Grant of a Patent, WIPO, <https://www.wipo.int/en/web/ipadvantage/w/stories/commercialization-of-an-invention-before-the-grant-of-a-patent> (accessed Feb. 10, 2026).

⁴⁷ Nuralia Nuralia, Amir Imbaruddin, Tri Widodo Wahyu Utomo & Yogi Suwarno, *Intellectual Property Marketplace: Increasing Information Technology-Based Public Sector Marketing in Indonesia*, 20 J. BORNEO ADMIN. 217 (2024), <https://doi.org/10.24258/jba.v20i3.1442>.

⁴⁸ Satyam Infoway Ltd. v. Sifynet Sols. (P) Ltd., (2004) 6 SCC 145, AIR 2004 SC 3540 (India).

⁴⁹ Daniel Russo, *Pandemic Pedagogy: Evaluating Remote Education Strategies During COVID-19*, J. Safety Sci. (2025), <https://doi.org/10.1016/j.jss.2025.112392>.

that university IP management schemes should be tied to industry to qualify for commercialisation. These international arrangements may provide tangible solutions that Indian institutions can adopt to enhance the combination of university-industry entrepreneurship and IP⁵⁰.

4.9. Deep Tech and Startup Insolvency Problems.

The emergence of deep-tech companies in India, especially in AI and biotech, has been a mushrooming factor, underscoring the need to enforce patent protection. The lack of a standard legal procedure for valuing IP assets in insolvency affects these companies; however, it poses a significant challenge for safeguarding key interests and highlights gaps in policy, IP portability, and financial regulation⁵¹.

4.10. Policies associated with spin-offs.

Experience at Institute Technology Bandung in Indonesia indicates that successful commercialisation of university spin-offs relies on a formal IP policy that includes patent incentives, licensing profits, TTO matching, co-incubation subsidies, and R&D fiscal incentives. It is a highly powerful framework that Indian institutions and policymakers may want to adopt to massively increase the level of academic entrepreneurship and IP commercialisation⁵².

4.11. The Negative Case: Missed Opportunity of an EdTech Startup.

Although the Bengaluru edtech startup had developed a groundbreaking AI-driven assessment algorithm, it failed to patent its process at the initial stages of its operations. Competitors then reproduced the model within 2 years, thereby eroding its competitive advantage. This lack of IP foresight cost them investor interest, and ultimately, they were acquired at only a fraction of the original investment. The case is one example of the failure to consider IP, which may

⁵⁰ Alexander Romero-Sánchez et al., *Exploring the Entrepreneurial Landscape of University-Industry Collaboration on Public University Spin-off Creation: A Systematic Literature Review*, e27258 (2024).

⁵¹ Stanley P. Kowalski, *Establishing Appropriate Best Practices in Intellectual Property Management and Technology Transfer in the United Arab Emirates: Building Human Capital, Global Networks and Institutional Infrastructure to Drive Sustainable Knowledge-Based, Innovation-Driven Development*, 14 INDIAN J.L. & TECH. 77 (2018).

⁵² Uruqul Nadhif Dzakiy et al., *Proposed Integrated Policies and Supports of University Spin-offs: A Case Study From Institut Teknologi Bandung*, 35 PROD. e20240125 (2025).

obstruct scalability⁵³.

4.12. International Lesson:

The Yissum Model of Israel. One of the world's leading university-based entrepreneurship organisations is Yissum, the technology transfer office of the Hebrew University of Jerusalem. Because Yissum requires that any invention by a faculty member be patented and subsequently either licensed out or spun off, it already has more than 10,000 patents and 1,200 licensed technologies to its name. In the case of India, with the academic entrepreneurship environment still in a formative stage, such models might offer tangible pathways to support university-industry connections⁵⁴.

4.13. Regarding Grassroots Innovation.

The NIF activity of searching for and preserving grassroots innovations, as in the case of low-cost irrigation pumps or herbal unguents, comes into view, creating the impression of the necessity of IP awareness outside elite institutions in the country. Such shoddy innovations are simply a display that IP protection is not available to tech startups, but, in fact, is a universal means of protecting creativity. Taking grassroots entrepreneurship into the mainstream IP ecosystem can also do much to promote democratised innovation⁵⁵.

5. CONCLUSION

Based on the above analysis, the point reiterated is that Intellectual Property Rights (IPRs) are not just tools and instruments of the law, but also the very enabling environment for innovation, entrepreneurship, and competitiveness in a knowledge-based economy. Since the enactment of the National IPR Policy (2016) in India, international rankings and indices, arranged in turn, such as the GII and GIPC rankings, and the WPI, have given IPRs higher priority in the national development plan and as a weighty business issue. Thus, a proper IP ecosystem leads to innovation, investment safeguarding, and contributes to strategic

⁵³ Azizi Othman, *Advances in Digital Marketing in the Era of AI* (Sept. 2022) (unpublished manuscript), <https://doi.org/10.13140/RG.2.2.14831.44966>.

⁵⁴ Gustavo Fuchs, *Yissum: The Technology Transfer Company of the Hebrew University of Jerusalem* [PowerPoint], Plataforma CTI (July 2013), https://plataformacti.cat/wp-content/uploads/2019/07/PPT_GustavoFuchs_Yissum_Seminari-Internacional-2013.pdf.

⁵⁵ Press Release, Ministry of Science & Technology, Indigenous herbal knowledge recognised through patents (Oct. 28, 2024, 11:14 AM), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2068785>.

commercialisation and resilience-building in general.

Nevertheless, the above scenario is counterintuitive to an Indian scenario. Liberal policies, the development and fine-tuning of institutional mechanisms, and the lack of IP literacy, unequal resource allocation, and relevant commercialisation channels remain unfavourable factors for maximising the use of IPRs. Case studies used in this paper, illustrating the incubator model and a licensing initiative led by MSMEs, provide substantiation that the road can be effective, provided that innovation is executed closely in parallel with high awareness of IP and support systems.

Similarly, through the courts, non-traditional aspects of the laws of IP, like the safeguard of domain names, are being considered by the courts, as a result of which the field of IP jurisprudence is undergoing change in line with technological realism.

Although India has achieved a lot, it has faced enormous hurdles. Some of the hindrances to further penetration of the IP culture are enforcement limitations, high transaction costs, and insufficient awareness beyond metro clusters. It is also the incompatibility between financial institutions and IP portfolios that prevents entrepreneurs from expanding their intangible resources. Unless these structural constraints are met, the innovation potential of India will not be fully exploited.

The way forward via a multi-pronged roadmap has been highlighted as follows:

- (i) Localised IP Advisory Cells within incubators and clusters of MSMEs.
- (ii) IP Financing Integration, in which patent portfolios are converted into creditworthiness.
- (iii) IP education embedded in the curriculum in universities and vocational programs;
- (iv) Software, data, AI-driven innovations, digital IP Infrastructure protection;
- (v) International Cooperation, as seen in Israel, the EU, and Brazil, fits tried-and-tested models.

Finally, this paper once again makes the point that IP is not seen as a compliance mechanism but as a strategic enabler of entrepreneurship. Early capacity building helps startups survive

and succeed in the protection, commercialisation, and scaling of innovations. India can not only bridge gaps in policy but also become a frontrunner in knowledge-based entrepreneurship through coherent policies, institutional fortification, and cultural alignment with IP thinking.