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India's Policy Shift towards Innovation, Entrepreneurship and Self-Reliance: Implications for India's Intellectual Property Policy

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Intellectual Property Rights (IPRs) are becoming key assets for competitiveness and addressing developmental challenges. It thus becomes imperative for a country to strategically protect its IPRs and create roadmaps for the development of this institution. The Indian government in recent years has taken a salutary paradigm shift by bringing innovation and entrepreneurship at the center stage of its economic development and addressing developmental challenges. The National Intellectual Property Rights Policythat came out in 2016 (NIPR 2016) can be seen as part of this innovation-driven inclusive growth approach. India becoming one of the most aggressive globally in creating new start-ups is among some of the visible outcomes of the policy shift. The IPR policy becomes more important in this new context. The paper revisits the NIPR 2016 to see to what extent it is an enabler forresearch, innovation, and entrepreneurship in the country. The pathways that it underscores for strengthening the IPR institution in the country, positions undertaken on contentious issues, and the long-term vision that it draws are examined. What types of further interventions/pathways may be required that can enrich the IPR ecosystem and create positive externality in the economy and society are discussed. The study proposes the need for framing a new IPR policy in the context of the fast-changinginnovation dynamics and the increasing role of IPR in this evolving landscape.

Keywords: NIPR 2016, National Intellectual Property Rights Policy, Research and Innovation, Intellectual Property Rights, IPR Policy Strategy

Intellectual Property Rights in the Contemporary Global Milieu

Knowledge has become the key source of competitive advantage which underscores the capacity of businesses to use knowledge in production, to create and translate new ideas into economic value, and to sustain knowledge-based wealth creation.[1] The knowledge-based economy is not only restricted to exploiting knowledge for economic wealth. It also calls for applying knowledge to address developmental challenges. Successful knowledge creation and exploitation are seen as the keysto creating innovation, commercialization, and addressing developmental challenges. This approach has become the new growth and development modelobserved from different countries, multilateral institutions, and other institutions' policy articulations. A good example of this is the edifice of Sustainable Development Goals that is built on this broad vision. The protection of tangible and intangible knowledge assets, knowledge transfers, and know-how and their protection is the new currency of the knowledge-based economy.[2]

Thus in this new context, the intellectual wealth protected through IPRs has become more important than physical infrastructure and natural resources. The core competency of nations and firms is on IPR assets that cover disruptive new technologies such as those on complex cyber-physical systems that underpin the Fourth Industrial Revolution. The engineering of biological matter through genetic engineering has led to unimaginable technological developments such as transgenic plants, animals and the isolation of human genes for using them to produce medicaments, biosensors, etc. These new disruptive technologies are calling for an expansion of the scope and breadth of protection.

The positive influence of IPR has been observed on technology transfer[3,4], and on transferring innovative technologies to the market.[5] The stronger national patent laws having a positive effect on bilateral imports of many products within the group of both large as well as smaller developing economies was observed[6] by Maskus and Penubarti (1995). This

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study underscored the enabling link between IPR and trade. Different studies have highlighted the competitiveness and increasing valuation of small firms having IPR assets. The valuation of intangible assets becomes easier when protected by IPRs. A close reading and critical examination of the different industrial revolutions do underscore that IPRs have been a key instrument for creating incentives for firms and individual inventors to develop new products and processes, drug firms to invest more inthe development of new drugs, and helped to create a culture of innovation across the society at large and generate economic wealth. Steam power and locomotives, electrification, integrated circuits,and varied new technologies and crafts (glass making for example) that drove the first, second, and third industrial revolutions have been protected by patents and other forms of industrial property rights i.e. trademarks, design, integrated circuit protection and trade secret. The role of IPRs has become more important in the new knowledge-basedeconomy which is having a pervasive effect in the economy and society. Among the transformative effects is in the industrial production process and product creation which is being cited as the emergence of the Fourth Industrial Revolution. The new products are driven by disruptive technologies that have emerged from advanced research and innovation and are aggressively protected by various forms of IPRs.

On the other hand, IPRs have also led to new forms of protectionism and monopoly. It has a long history of contestation which is reflected in present times in a range of areas; from access and availability of critical drugs, creating barriers for technology transfer, restricting firms from developing countriesto bring affordable substitutes to high-cost patented products, biopiracy, etc. This has led to a debate on access and affordability of drugs, biopiracy, and unfair control of developing countries' natural resources, increasing protection of open research among others. IPRs in many cases are leading to unfair market distortions and are coming in conflict with competition laws, thereby disturbing the balance between them. All these are placing IPRs at the center stage of global discourse, challenging the ability of the patent system to encourage innovation and diffusion of technology. TRIPS Agreement has compelled developing countries to bring new forms of protection and increase the scope of protection to different domains.[7] North countries particularly the USA are pushing through bilateral agreements leading to further protection and restricting flexibilities above the TRIPS provisions. A North-South divide is emerging which has longer negative implications.

In this context, itmakes a strong case for a country to create an overall policy direction that can provide a strategy for the country to develop a robust IPR system; that can promote innovation and creativity; enhancing the capacity of enterprise and public institutions to create and exploit IPR. It is also important that the policy direction provides for instruments that can safeguard against unfair monopoly infringement against traditional knowledge, and exploit provisions that can help in enhancing economic and social welfare. It should guidethe developmentof institutional mechanisms that can help to properly exploit IPRsand address contentious issues and disputes.

The National Intellectual Property Rights Policy, 2016[8] can be seen as a key policy document in this regard. Bringing a policy document gives an important signal of India's intention to develop IPR as a strategic instrument. The extant studies have drawn only a limited boundary within which they have examined this policy document. Mainly the debate on this policy hasdrawn on what the policy document has left out and how it is not framed within the larger context to address contentious issues. Many of them were short pieces on internet blogs or newspapers. These can be broadly discerned under raising the issue of enforcement challenges, attempts to address US concerns, maximalist approach in certain provisions, disconnection from the development concerns of the country, etc. Hindu newpaper[9] for example emphasized the flawed assumption of the policy that "more IP means more innovation". Gopakumar[10] criticized the policy calling it unsuitable for India's socio-economic requirements drawing attention primarily to the access to affordable medicines, technology transfer, and its dissemination. Abrol[11] drew attention to the vague provisions of the policy.

Objective and Research Questions

In recent years, India has undertaken a strong policy shift towards innovation and entrepreneurship. Atal Innovation Mission, Startup India, Make in India, and Digital Indiaare the key overarching policies framed in this regard. These are complemented by sectoral, regional, and state-

drivenpolicies. Organizational innovation is visible across publicly funded institutions to support the new policy framework. The draft of the 5th National Science, Technology, and Innovation Policy (STIP 2020)[12] is a further initiative to create mechanisms for strengthening the research and innovation ecosystem.In this new policy shift, the role of IPRs becomes center stage. We thus contend that analysis of this policy document i.e. NIPR 2016 needs to be situated within the broader framework of the country's research and innovation ecosystem. It also needs to provide directions that would help the country effectively negotiate the contemporary challenges of the global IPR regime. Thus, it is important to revisit NIPR 2016 and undertake an analytical examination through the following objectives of this research:

(i) To what extent NIPR2016 is an enabler for strengthening the country's IPR ecosystem?

(ii) What are the mechanisms it has formulated to create a culture of IPR awareness, address contentious issues, and, provide support for innovation and entrepreneurship?

(iii) What are the gaps and the issues that the policy document needs to address especially with the new policy shift?

Drawing from this, the study draws attention to the implications of this policy in the larger context of innovation and development. It also looks at the gaps that the policy needs to address to make it more effective. The paper argues for framing a new IPR Policy.

Understanding the Institutional Framework of IPR

IPRs can be distinguished in terms of exogenous and endogenous factors that govern the IPR ecosystem. Major attention has been on the patent and patenting systems as they have the strongest form of protection and have a major influence on economic and social welfare. The emergence of new disruptive technologies that challenge the scope of patentable subject matteris perceived as the main exogenous force. The exogenous factors also include many contentious issues that have been raised post-TRIPS such as technology transfer, medicine access, data protection, and new demands for digital content protection. The efficiency of the patent system in terms of timeliness, patenting cost, examination process, and quality of patent examination, are seen as a major endogenous factor[13]. Improving patent quality implies the extent to which patents fulfill the patentability criteria (novelty, non-obviousness, and industrial applicability), and timeliness of examination, successful disclosure of the patent application by applicants. Exogenous and endogenous factors are not static and are fundamental to the ability of the IPR system to encourage innovation and diffusion of technology.

Moschini[14] (2004) underscores how IPRs introduce distortions in the economic system. They distinguish the impact of IPRs, ex-ante and ex-post. They argue that IPRs provide an incentive for innovation, a promise for a limited monopoly without which many innovations may not happen. However, the benefit of the innovation to the society is restricted as profit-maximizing monopolies would control the wide availability of the innovation. The impact of IPRs can be seen in terms of Dynamic Gains, i.e., improved innovation incentives, and static losses, i.e., restricted use of innovation. Heller and Eisenberg[15]provide another important view of distortion that can happen and defeat the role of IPRs in promoting innovation if there are too many concurrent fragments of intellectual property rights in potential future products (or by permitting too many upstream patent owners to stack licenses on top of the future discoveries of downstream users). This has a higher probability to happen in biotechnology as the development and commercialization of a new genetically engineered product has to navigate through a large number of patented technologies. Scholars like Kaldos[16] among others underscore that many high potential innovation ideas keep floating in the laboratories and are not exploited due to stringent IPR requirements thereby remaining undeveloped. This poses a serious concern to push useful innovationto market. Lall[17] and Shamsavari[18] view the market as a flawed one due to IP protection mechanisms.

Issues of public health, benefit sharing, technology transfer, etc. have been framed within the different negotiations post-TRIPS Agreement. However, there is still no clear pathway for developing countries to successfully negotiate these issues. Developing countries find TRIPS provisions create new barriers to developing technological capability, technology transfer, etc. The AIDS crisis in Africa, the recent COVID-19 pandemic for example has called for a more liberal view and framework for areas especially in public health. They have also demonstrated how strong policy interventions during the AIDS

emergency in South Africa for providing access to more affordable drugs from India compelled big drug firms to stop legal proceedings against infringements. The recent negotiations for a COVID-19 vaccine patent waiver for exports of patented vaccines produced in another country also highlight the importance of policy assertion and policy framing. The 2001 Doha declaration on the TRIPS Agreement and public health and other related conflict zones need strong policy framing and positions by developing countries to negotiate and bring the required changes in the TRIPS Agreement. In the same context, it calls for resolving the inherent conflict between the TRIPS Agreement and the objectives of the Convention on Biodiversity (CBD). Under CBD, countries can regulate the access to biological material found in their territory and can ask for benefit-sharing agreements with the beneficiary. TRIPS Agreement is silent on rights over the knowledge and use of biodiversity while the provisions in the CBD are found to be more aligned with the interests of developing countries. TRIPS provide various types of flexibility which countries can exploit by framing their IPR policy.

India has been cited by developing countries for bringing new novelty in harmonizing its IPR laws as per the TRIPS Agreement without violating its provisions. It has also provided directions to other countries in developing their IPR framework. Some of the important policy innovations undertaken by India are highlighted in Table 1. India has also created a benchmark for protecting traditional knowledge by creating The Traditional Knowledge Digital Library (TKDL). The digitalization of Indian ancient texts of medicine and health is in five languages namely English, French, German, Spanish, and Japanese. Major patent offices have signed an agreement with the Indian government to use this database as a prior art search. This has been effective in preventing unfair misappropriation of India's traditional knowledge. India's *sui-generis* system for plant variety protection, The Plant Variety and Farmers Right Act (PVP&FR) has incorporated various provisions to provide opportunities to farmers to protect varieties traditionally cultivated by farmers (Farmer's variety), varieties already available in India (Extant variety) along with new variety protection. It also has various safeguards for farmers and has provisionsfor benefit sharing.[19]

The above discussions provide some key directions to examine the NIPR 2016 in the context of the objectives of the study, critical analysis of the gaps, and how it can be strengthened further.

National Intellectual Property Rights Policy, 2016: An Analytical Introspection

This policy document asserts that a comprehensive IPR Policy is required to create a robust intellectual property system in the country. It has drawn attention to many facets of IPR that it underscores as key factors impeding the pervasive influence it should have for the country to become a knowledge-based economy. In line with this argument, the policy has articulated various initiatives that it sees can help strengthen among others the institutional mechanism of intellectual property governance in the country. The core of the policy is the set of seven objectives that it asserts, need to be addressed for creating a robust IPR ecosystem for the country. This brings clarity on the areas that need focus and on different parameters, the progress on each of these important dimensions can be measured and gaps can be addressed. Among the important organizational changes visible in the policy is bringing the administration of Copyright Act, and Semiconductor Integrated Circuits Layout Design Act under the DIPP (now DPIIT). The renaming of The Department of Industrial Policy and Promotion (DIPP) as Department for Promotion of Industry and Internal Trade (DPIIT) in 2019 is also an important change. It makes a stronger assertion of bringing in its ambit internal trade. DPITT has thus administration of all the industrial property under one department. This creates an institutional mechanism inaddressing disconnect between industrial property and copyright. A separate institution CIPAM (Cell for IPR Promotion and Management) has been created to strengthen operational efficiency among different IP offices and to promote, create, and commercialize IP assets. Figure 1 highlights the seven objectives of the NIPR 2016 and some of the important actions that are visible under them after this policy was released.

The DPITT has been made the nodal body for the Startup India initiative. This has helped to create a more effective support system for Startups that are registered with DPITT. Among them is the incentive for registered start-ups for patent filing; an 80 percent reduction in the cost of filing patents. IPRs as mortgageable assets as envisaged in the policy getting shape with the creation of the 'Innovators Growth Platform'. It provides an opportunity for companies

Table 1 — Aspects of Indian IPR framework

Aspect	Implications	Indian context
Compulsory License	• Effective safeguard against the potential abuse of monopoly by patentees and has positive implications for public health • Strong positions by USA, and major pharma MNCs on providing compulsory license	• Country's first Compulsory License granted to NATCO against the Bayer cancer drug "NEXAVAR" • First and only one such case in favor of granting Compulsory License
Technology Transfer and Commercialisation of Technology	• Effective technology transfer strategies are required along with promising inventions for return on investments	• The provision for expedited examination of the application in the Patent Rules 2016 will facilitate the commercialization of inventions
Data Exclusivity	• Companies argue to protect the test data along with their product since they spend years of effort and investment collecting this data	• If authorities use this data to test the generic drugs, the cost and time for the generic drugs to enter the market would decline [20] (Basant,2011) • If allowed, it will slow down the growth of the generic pharmaceutical industry and will affect the availability of low-cost generic medicines to the public.
Evergreening of Patents	• Evergreening may impede the generic drug industry	• India adopted the 'enhanced efficacy' provision in Section 3(d) of the Patents Act • Led to extensive debate with foreign MNCs, big pharma firms • *Novartis* v *UoI* – Novartis lost the case due to non-fulfillment of the"enhanced efficacy" requirement beyond establishing patentability requirements
Bio-piracy of Traditional Knowledge	• Indigenous knowledge or resources of nature are used by others for profit, without permission from indigenous people conserving that resource • Patents Act and Biodiversity Act (BDA) are meant to operate in coherence	• By conserving the customs of indigenous persons we can reduce ecosystem degradation • India has always supported for protection of traditional knowledge • Section 3 of the BDA provides for prior approval of National Biodiversity Act (NBA) in obtaining any biological resource occurring in India • *India-US Basmati Rice Dispute*-The Indian government intervened and several claims of the patent were invalidated • Benefit sharing provision is provided to the holders who own the biological resources • NBA can ask for revocation of a patent* in case of non-fulfillment of prior permission • Conflicts have emerged between the Patent Office and NBA on the issue of timelines.
GM trait and Protection of Plant Variety	• Impede development of new plant variety	• Removal of the requirement of NoC from the patent-holder for registration of a variety or hybrid containing a patented trait • This will allow: (a) registration of new varieties; and (b) marketing their new varieties of plants and seeds

(*contd.*)

Table 1 — Aspects of Indian IPR framework

Aspect	Implications	Indian context
Domain Name Protection	• A law harmonious with international standards on the protection of domain names is essential in addition to the protection offered by Trademarks Law individually.	• India lacks any Domain Name Protection Law and many cybersquatting cases have been reported. Still, no measures have been discussed at length in the policy to deal with the issue.
University and other public-funded Research Protection	• To provide ownership and benefit-sharing mechanisms for researchers in universities, government organizations, and other non-profit institutions	• The issue of difference in positions of academic scientists and the industry could be addressed by developing legislation for promoting publicly funded research[21] (Ray, 2011)

*Letter No. NBA/Tech-Gen/22/32/11-12-15-16-3478 dated 19.01.2016 from National Biodiversity Authority to European Patent Office regarding 'observation filed under Article 115 of European Patent Convention'

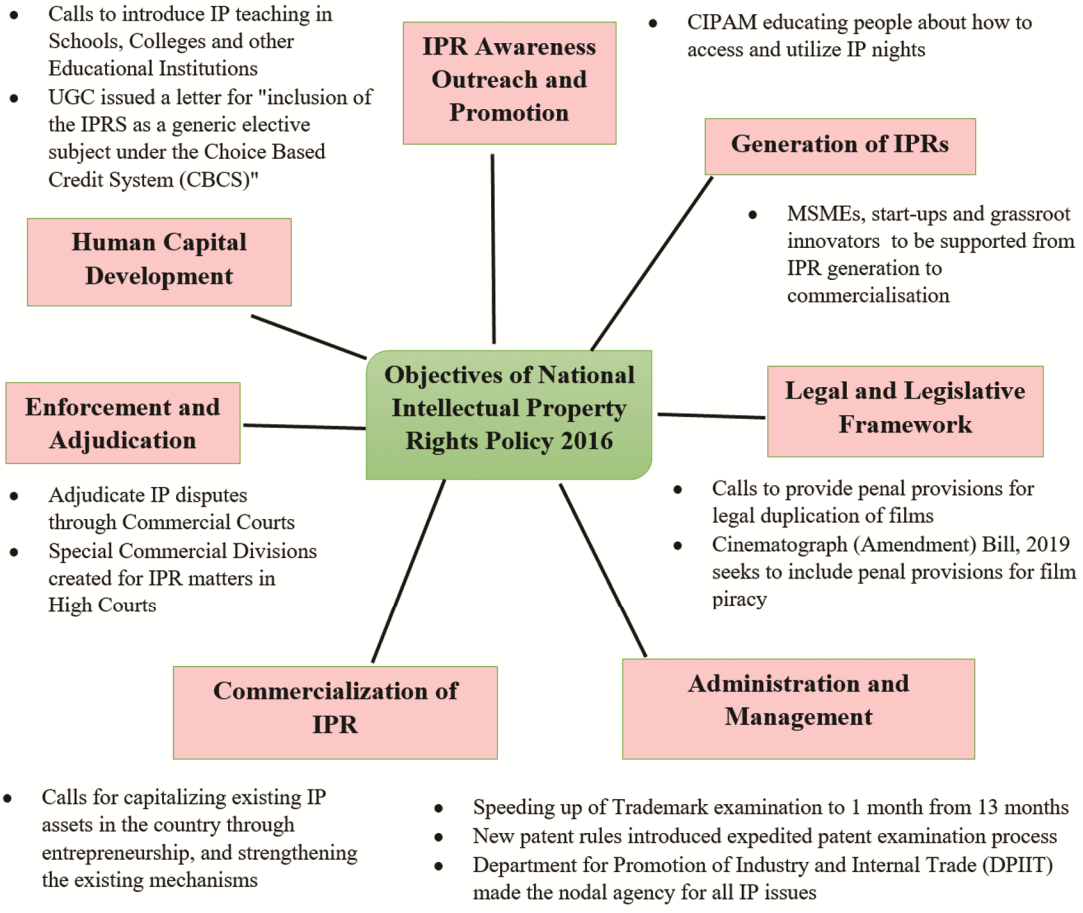

Fig. 1 — Key directions of NIPR-2016. Constructed from National IPR Policy 2016

and startups to list (go public) and raise money. It is in the early stages and is expected to become more effective as it evolves.

IPR policy cannot be seen in isolation. The policy document has made efforts to draw attention to the larger ecosystem in some cases. One of them is strengthening the legal and legislative framework. The policy document has called for the development of a commercial court for IPR which in principle is the follow-up of the Commercial Courts, Commercial Division, and commercial Appellate Division of the High Court Act which took effect in 2015. The outcome of this is that in major High Courts in the country, an Intellectual Property Division (IPD) has

been established. The linkage with biodiversity authority, the feasibility of IPR exchange, IP creation, and facilitation for startups are some of the important directions given in the policy which as highlighted have led to visible outcomes. The futuristic direction is also visible for example calling for IPRs as a securitise asset to encourage start-ups.

The subsequent sections examines aspects that needed attention in the policy document i.e. NIPR-2016.

Grassroots Innovation, Home-Grown Technologies, and Utility Model

India has taken many initiatives to support incremental innovation which reaches out as grassroots innovation, and frugal innovation. The National Innovation Foundation and the Honey Bee network have been instrumental in bringing these innovations to the center stage and creating incentive mechanisms to support these innovations. The protection of these innovations within the present system is only available through patents. The utility model would have provided ample opportunities for protecting these innovations. There are less stringent criteria for utility models also called petty patents and are generally given for eight to ten years[22] (George, 2015). This also goes with the policy thrust by the government for the promotion of startups, SMEs, and entrepreneurship. *The Economic Advisory Council to the PM* has also argued for having a Utility Model provision in our IPR system. Our ongoing study provides a new dimension to the Utility model. It has shown how it is becoming also important in many high technologies. Many Fourth Industrial Revolution technologies from Drones to Brain Computer Interface technologies are also surrounded by Utility models.

The policy envisages capacity building, customized programs for the specific needs of MSMEs, start-ups, and entrepreneurs, strengthening existing mechanisms to promote entrepreneurship to extract value from IPRs through commercialization, and reducing transaction costs for start-ups to stimulate the generation of IPRs. As Kingston[23] (2010) highlights, the power of SMEs and Startups to protect their inventions is limited by capability market power even though their inventions are suited to be protected by such power. Many of the inventions of SMEs are significant incremental innovations but may not be able to address the stringent criteria of patents. Many developed and emerging countries like Germany, Japan, China, and South Korea among others have utility modelsin their IPR provision. Through this provision in their IPR system, they have helped to protect their small-scale industries and created a culture of innovation. Utility models can be a very useful tool also for creating IPR awareness as envisioned in this policy document as many inventions from informal innovators, school students, etc. can be protected through the utility model. The protection like this gives recognition and the possibility of deriving fiscal incentives. In the process creates awareness for IPR as more can see the value of protection. The inclusive national innovation framework approach calls for giving new incentives for the creation of homegrown technologies and giving more support to frugal innovation. Thus a clear roadmap is needed for creating protection mechanisms through the enactment of suitable Utility model provisions in India through a regional innovation system. The policy document should have deliberated on the resource allocation and statutory provisions for India's Regional Innovation System supported by IPR instruments at union, state, and concurrent subject list

Strengthening the University Research Ecosystem

The US Bayh Dole Act, 1980, and subsequent acts such US-Small Business Patent Procedure Act has been adopted by various countries as it has created a new incentive mechanism for the translation of publicly funded research for commercialization. This has been shown to have a significant influence in universities in the USA with researchers creating spin-offs with ownership of IPR assets that they were allowed through this act. The studies show its highly positive influence in countries that have framed their law drawing from this act. In most of the Indian universities and research institutions funded by the Ministry of Education, Government of India, an incentive mechanism similar to this is available. Indian public funding organizations have also shown a liberal approach to this. However, an overarching provision with legal backing may provideclarity and uniformity on kick-starting investing in IPR resources.

Creating Awareness of Different Categories of IPRs

There is a strong thrust on creating awareness of patents. The role of other IPRs and their importance

need dedicated focus. Various provisions in the PVP&FR Act can provide new opportunities to farmers and seed startups.[19] The study draws attention to the need for this act to be made aware to the stakeholders for making a real impact on the agriculture ecosystem. India is rich in traditional ways of manufacturing which are location-specific and also have unique region-specific products that can be protected through Geographical Indications (GI). The implementation of the GI Actthrough the Authorised Licensing programneeds to be aggressively made aware in the country. As India is moving into high technologies, the trade secret that needs incorporation of material transfer agreementsamong others is getting important to protect from unfair misappropriation. Similarly, the protection of the Semiconductor Integrated Design Layout Act is very important in this new context. Design registration in India is far below the expectation and potentiality of the country's capability. The awareness needs to be directed towardthis intellectual property protection. This will help to bring a culture of innovation protect the intellectual assets and derive benefits for Indian firms and academia/research institutions.

Improving Patent Quality

Low-quality patents do not comply with the patentability criteria and may seriously harm the innovation process by causing the public to pay higher monopoly rent to the product. This can impose unnecessary constraints on downstream innovation, risk undermining scientific research and advancement of technologies[24]. Major patent offices have already put in place mechanisms to improve patent quality. The 'Raising the Bar' initiative was implemented by the European Patent Office (EPO) in 2007 to improve the patenting system with a primary focus on patent quality. It gave three key recommendations covering (a) changes in existing practices and procedures, (b) expanding the scope of the patent prosecution process, and (c) recommendations to change legal standards, primarily to set higher standards for inventive steps and modify the definition of the 'person skilled in the art'. USPTO has introduced a 'peer-to-patent' system allowing third parties to contribute to retrieving prior art and suggesting it to examiners. High patent pendency rates with huge backlogs, severely limited employee strength, patents getting more complex, and difficulty in finding prior art on new and emerging technologies have all contributed to falling patent quality.Thus, a patent policy should strongly focus on developing institutional mechanisms that can improve patent quality. The issue of patent quality is more severe in emerging countries like India as with opening of markets and adherence to the TRIPS Agreement have further constrained the IPR institutions. Thus, the key thrust of the NIPR Policy 2016 should have been providing novel implementable directions for improving patent quality.

Conclusion

The study examined the NIPR 2016 in the context of its role in strengthening the IPR ecosystem, as an enabler for innovation and entrepreneurship. This revisit also was examined in terms of its relevance in the contemporary context. The examination showed that it was a timely action to bring the NIPR 2016 as the country was placing innovation and entrepreneurship as the central thesis for economic growth and development. The seven objectives and call for action against each of them that drive the policy are well constructed. It has led to some important changes and has improved the administration and governance of IPR.

The policy document however shows gaps when we examine it in the larger vision that drives this policy namely 'Intellectual Property stimulates creativity and innovation for the benefit of all'. One can observe that many suggestions have been made which are very useful in meeting the visionbut provides only in some instances the pathway for their implementation. Further, there is only a restrictive view of IPR with the larger issue of IPR being developed as a strategic asset for competitiveness and trade missing in the policy framework. The policy document has also not addressed contentious issues and strategies to be adopted on them. The distortions that happen due to multi-layering as highlighted by Heller and Eisenberg[15], Data Exclusivity, Compulsory licensing, increasing scope of IPR rights, and the shirking space for research exemption through provisions such as digital management rights that are creating new challenges, technology transfer,etc. The policy document should have also given its position on the utility model that has been discussed on many occasions on its positive influence on protecting incremental and grassroots innovations. *It would have been useful to discuss how* India intends to situate its IPR ecosystem in the changing context of global

international cooperation on IPR for example emergence of groups like IP5.

In the light of above and other factors that have changed the context from the time when the policy was released in 2016, we argue the need for having a new IPR policy document. IPR Policy documents should be created periodically. This will help to provide directions and pathways to follow. We suggest some observations on the changing context which can help situate the new policy along with the issues that we have raised.

The ecosystem of innovation is changing very quickly. For example, the 4IR technologies are maturing and are aggressively protected through patents. Standards are increasingly getting protected through patents. The complexities of the technologies demand new skill sets to judge their novelty, non-obviousness, and utility. Many 4IR technologies also have ethical dimensions that need to be properly evaluated whether they do not overstep the patent norms. Examination of the patents for granting them is becoming challenging as requires deep science-based knowledge to see that patents that have valid claims are granted. Cyber security and protection of novel business models and embedded technologies that support e-commerce calls for innovative new thinking on framing appropriate IPR policy.

The need for manpower has been highlighted in the policy paper by the EAC to the PM[25] We further posit that along with that, specialized manpower needs to be created to strengthen the capability for judging properly the complex patents. From the early stages in schools and colleges, IPR study should be made part of the curriculum that can create this type of specialized manpower. This will complement the IPR awareness that is visualized for creating a culture of innovation and creativity in NIPR 2016.

The new policy document needs to draw attention to the roadmap for creating synergy among the key stakeholders that are implicitly or explicitly influenced by IPR. A case in point is the linkage between Competition policy and IPR. Various court cases are observed globally particularly in high technology firms using unfair monopoly practices, which has led to anti-trust provisions. The IPR policy needs to have a fine balance with competition laws as a good policy framework can help in supporting each other. These types of aspects should be given attention in the IPR policy in a more detailed manner.Patents have complex relationships with compulsory licensing, competition policy, technology standards policy, international trade, and health care policy, among others. Policy framework, for example, needs to properly link with the competition policy to define antitrust provisions for stopping unfair monopolies through IPR created by firms. India's policy framework is silent on this issue.

The IPR Policy document needs to provide directions for India's position on open access, protection, and royalty sharing on public-funded research. Trade secrets protection in India is a major concern for global players as they seek to expand their R&D and innovation in the country. As India grows in IT and innovation, there has been a demand for regulations to discourage the theft of data and trade secrets. The EU adopted a Directive on the Protection of Trade Secrets on 8 June 2016. The US has also been supporting the protection of Trade Secrets through its statutory laws.

India also needs to change its IPR provisions based on technological progress and its capability. The provision for the utility model already has been discussed. Basant[20] (2011) argument for a review of the emerging IP regime in India, the development of regulations on incremental innovations, and data protection to better the opportunities for Indian firms to participate in global networks and build technological capabilities. India has created a niche in drug delivery with many patents now granted to Indian firms in the USA. The startups that are emerging and becoming successful are creating new business models that are embedded in the clever exploitation of e-commerce models. The policy document from a long-term perspective needs to deliberate on these issues which NIPR 2016 has not touched upon.

It is important also to discuss and reflect on policies adopted by other countries to see whether with suitable modifications they can be useful in the Indian context. Learning is not only from developed economies but also from other emerging/developing economies. The case in point is the IP Policy of South Africa (Phase 1) released in 2018. The policy is aligned to promote local manufacturing, and competitiveness, using IP in the informal sector in South Africa. This can be important in the context of India.Policy framing is also supported by bilateral and multilateral dialogues and sharing experiences. The OECD for example has initiated various dialogues with other countries in IPR. Policy dialogues and

sharing exercises need to be integral in developing India's policy framework.

The office of the Controller General of the Patents, Designs & Trademarks is taking many positive actions to create an enabling ecosystem that is visible through its website. The new policy framework that is proposed can become a further enabler in making IPR a key instrument for India's creativity and innovation.

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