
Introduction

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Biographical notes: Shishir Kumar Jha is an Associate Professor at the Shailesh J. Mehta School of Management, IIT Bombay. He received his dual Master's degree in Business Administration and International Relations and his PhD in Political Science from Syracuse University. He has 20 years of teaching experience at different institutions, including IIT Bombay and Ithaca College, New York. He is actively engaged in analysing and theorising various aspects of the knowledge economy, particularly the impact of digitisation on knowledge flows. He was twice awarded the Best Teacher Award from the School of Management and has supervised four doctoral theses.

Gouri A. Gargate is practising IP Consultant and Patent Attorney and has wide experience in IP law, industry and academia. She is a microbiologist and her background in IPR is reflected through PhD in IP management from IIT Bombay, LLB, PG Diploma in Patent Law, registered patent agent (IN/PA 1930), TIFAC scientist and DL 101 certification. Her areas of interests are IP audit and IP management system development, patentability analysis, patent drafting and prosecution, technology landscape and trend analysis. She has filed her own patent, published journal papers and had presented research papers at international technology management conferences such as PICMET.

How does one find the adequate balance, in a developing country such as India, between providing incentives for innovators, on the one hand, and allowing for the populace at large to access the fruits of such innovative activity, on the other? The debate on intellectual property rights is rather significantly fraught in addressing such concerns. If the terms of protection are considerably strengthened, as appears from legislative trends the world over, then access to innovation may suffer, on account of higher prices. However, if such terms are quite weakened, a rather unlikely scenario, then it is argued that the incentive to innovate is inadequate.

The history of innovation in India is filled with a range of examples, from using indigenous resources to drive innovative activity, to creating a broader economic self-sufficiency, to placing increasing emphasis in contemporary times, on innovation defined around corporate, for profit motifs. The Indian Government, since independence, has sought to promote a wide range of research and development (R&D) policies that encourage both institutional (public) and private (firm-based) collaboration. The importance of intellectual property rights is not lost on the nation's policy makers. India has keenly contested its view on patents, copyrights and geographical indicators, three

significant areas of national interest, at various international venues such as World Trade Organisation (WTO) and World Intellectual Property Organisation (WIPO).

Both WIPO and WTO, as international institutions, have continuously sought to harmonise intellectual property related laws and help protect the various stakeholders' interest. Various international treaties, policies, agreements such as the Madrid protocol, the Lisbon agreement, the Strasbourg agreement and others have been specifically introduced within WIPO, as and when required. The adaptability towards such new IP regimes and the pace of acceptance of these changes are largely governed by the differential capabilities of many state members. The WIPO academy, for instance, through educational activities provides necessary support for spreading the relevant IP knowledge and awareness. The 'use of IP for development', encompassing social, cultural or industrial dimensions is, for instance, a popular WIPO initiative.

In an increasingly knowledge driven economy, the importance of encouraging and facilitating information flow is, no doubt, rather crucial. Intellectual property rights as envisioned under the TRIPS agreement has provided a broad set of stipulations that WTO member countries need to abide by or align with. These stipulations also provide considerable flexibility (*sui generis* conditions) to developing countries to take appropriate advantage. For instance, Section 3 of the Indian Patents Act, has language that insists on a stronger threshold for granting patents.

At the institutional level, the Indian Institute of Technology at Bombay, with support from the Ministry of Human Resource Development (MHRD) and in active collaboration with the National Institute of Industrial Engineering (NITIE) at Mumbai, have together made a serious attempt to create a platform dedicated to intellectual property studies, where research scholars, practitioners, academicians from within and outside India can productively come together and exchange and discuss their ideas regarding the 'development' of intellectual property. This platform, christened appropriately as MELT (management, education, law and technology) has been categorised into 11 specific domains of research. This special issue is an attempt to bring together the views, understandings, methodologies, practical experiences of scholars that have participated in a recent (2014) MIPS Conference (Management of Intellectual Property Rights). The 11 specific domains are:

- 1 economics of commons
- 2 managing technology and knowledge transfer and spillovers
- 3 standardisation and pooling through IPR
- 4 identification, decisions and strategic management of IPR-IP informatics and analysis
- 5 missing IP management in strategy
- 6 myths and realities in IP quality, valuation and its branding
- 7 navigating the digital jungle – IPR as the compass
- 8 public institutions, requirements and intergenerational equity of IP
- 9 rationales and paradigms in the role of IPR
- 10 the public-private dichotomy under TRIPS flexibility and maximum standards
- 11 open innovation – does IP get in the way.

The eight individual independent research papers compiled in this special issue cover contemporary issues in IP law, policy and strategy, TRIPs and patinformatics. The research papers address these issues through various methodological approaches such as IP analytics, case studies and content analysis. The specific sectors of study encompass pharmaceutical, agriculture, energy sciences policy and technology management.

It would be opportune to mention that 'IP analytics' is becoming an increasingly popular tool for investigating IP-related concerns. Researchers, lawyers and IP practitioners are widely using this tool to unearth insights apparently hidden within patent documents. Three papers within the present compiled set have used the IP analytics approach. This approach has been skilfully applied to areas such as R&D management, technology management, innovation management, human resource management, litigation, patent prosecution, mergers and acquisitions, portfolio management, and so on.

The research paper by Menon, Jha and Jain, attempts to apply an IP analytics tool to the agriculture domain with specific focus on agri-biotechnology. The use of biotechnological tools in life sciences and agriculture, with over half of India's population still dependent upon it for sustaining its livelihood, is indeed becoming a significant area of research. Several large organisations such as Syngenta, Monsanto, BASF are engaged in research within agri-biotechnology. The paper provides a patent landscape to analyse the state-of-the-art in crop biotechnology research emerging in India for the period, 1994 to 2014, and to examine in particular the trends in patenting activities undertaken by various organisations. The paper also presents the several implications for the Indian seed industry and its stakeholders.

The research paper by Pulate, Deshpande and Hirwani propose the use of 'Dice coefficient' and IP analytics to identify potential licensees. The paper clearly identifies the challenges faced during technology transfer, by citing the use of a combination of methods where international patent classification (IPC) acts as a vector for Dice coefficient calculation. The paper demonstrates, through relevant examples that an ideal licensing deal can be made between those entities with similar technological abilities, an aspect that can be quantified by using the Dice coefficient.

The paper by Kelaskar, Mukundan and Jain, shares the exploratory work where patent analytics is applied to 'crystalline silicon solar cells' technology. Through patent analytics, they argue that one can identify and analyse aspects of 'who versus where versus when versus what' of technology growth. The authors have sought to identify two unique strategic approaches in the metallisation area.

The research paper by Chakrabarti is related to the specific domain of the 'public – private dichotomy' under TRIPS flexibility and maximum standards. His paper elaborates on specific impact and significance of compulsory licensing (CL) for access to inexpensive medicine. The views are supported by discussion of how various countries are seeking to engage with CL under section 84 of Indian Patent Act, an important consideration of the Indian Patent Law enactment.

The paper by Dhulap, Joshi and Kulkarni present a frame work that incorporates the 'obvious to try' doctrine for evaluating non-obviousness. Patentability criteria that is encompassed by novelty, non-obviousness and industrial application are, as we know, at the heart of the patent document. Among these, identifying and establishing the 'non-obviousness' of the particular 'invention disclosure' is perhaps the most challenging task. Case laws do help as setting precedents for taking appropriate decisions. This paper, in particular helps provide a deeper understanding, as we grapple with this complexity.

The specific paper by Bhardwaj, Padmanabham, Jain, Momaya and Joshi, is a case study about a government research organisation. The authors have made an attempt to provide linkages among the following: IP value chain, intellectual property development indices (IPDIs), complementary assets requirement for radical versus incremental innovations, and alliance formation strategies. The effort is to examine technology management strategies, specifically its adaptation or diffusion of technology as critical concerns for research institutes or R&D intensive laboratories. Collaboration, crowd sourcing, various modular approaches or outsourcing are by now fairly widespread and well adopted practices.

The paper by Krishna and Jain is an attempt to study the relevance of the renewal data of patents to develop insights for the strategic management of patents by firms and other institutions in India. With plethora of patents being granted, we do understand that IP management is indeed a complex process. The managing of patent portfolio is one such key activity. Decision making related to this activity requires specific forms of intervention by respective departments within any organisation.

Finally, the paper by Venkataraman Bhagwat, Deshpande and Lanke attempts to correlate the pre and post TRIPs patenting trend of pharmaceutical firms (MNCs) within India. This study finds that even after an amendment of the Indian Patent Act in compliance with TRIPs norms; MNCs continue to file several patents in India. TRIPs compliance is a slow, even if inexorable process, in developing and least developed countries. These countries were unsurprisingly granted an extra number of years to implement the applicable changes to their national laws. This was achieved basically in two tiers of transition according to a country's level of development. Clearly, such alignment with TRIPs norms was a decisive shift, a change that is reflected in terms of patenting activity by MNCs.

Overall, these eight research papers, vigorously argued with facts and evidence, are indeed a rich source of knowledge for better understanding the role of intellectual property in developing countries. We definite feel that this ensemble of work will help scholars, practitioners and academicians to receive better insight into contemporary IPR related issues.