



*A Brief Report on:*

# Activities and Recommendations on Intellectual Properties

*Compiled and Submitted by:*

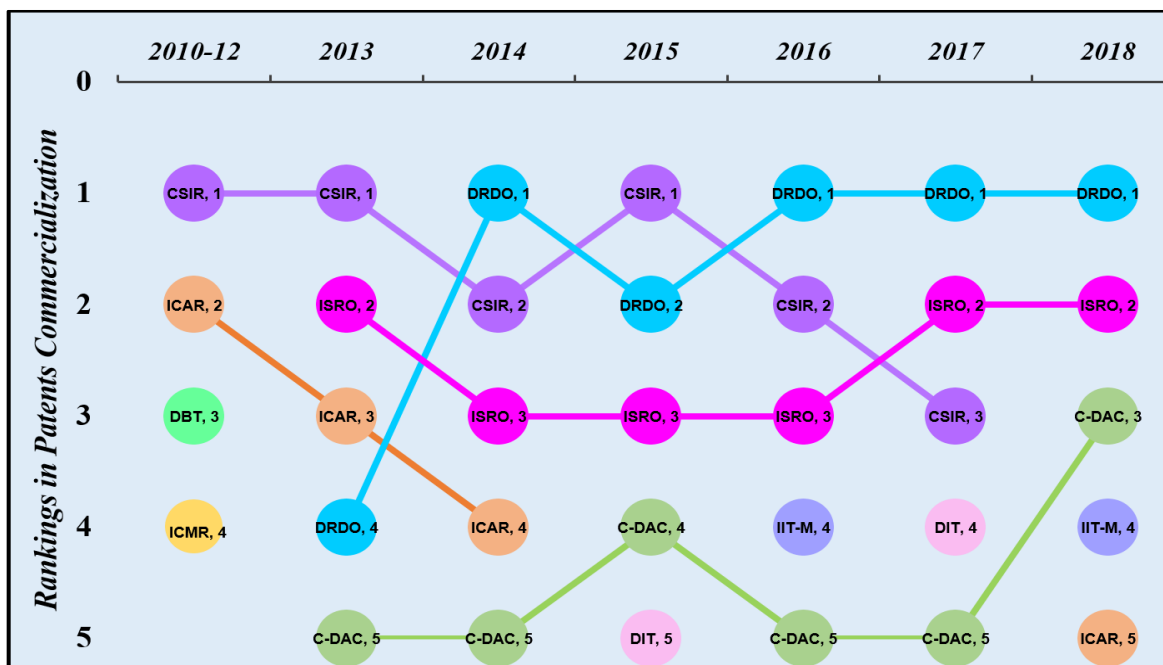
**Mamta Bhardwaj**

Sr. Scientist C, DST-Centre for Policy Research  
Panjab University, Chandigarh.

*Under the Supervision of:*

**Prof. Kashmir Singh**

Coordinator, DST-Centre for Policy Research  
Panjab University, Chandigarh.



**Year: 2015 – 22**

**Official Website: [cpr.puchd.ac.in](http://cpr.puchd.ac.in)**

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*A special thanks to former coordinators Prof. Rupinder Tewari and Prof. Nirmala Chongtham for their unconditional support at every step since the inception of this Centre. A special gratitude to Dr. Radhika Trikha, Sr. Policy Fellow, DST, New Delhi and Dr. Mansimran Khokhar, Fmr. Assistant Coordinator, DST-CPR at PU, Chd. for being the biggest support system of the Centre. An appreciation is due towards the Ex-officers of the Centre i.e. Dr. Navkiran Kaur, Dr. Kulwinder Singh, Ms. Amandeep Kaur, Ms. Sukriti Paliwal, Dr. Oinam Santosh and Mr. Ashok Gupta for all kind of support and contribution towards the execution of the studies conducted at the Centre.*

**Objective:** *Adopt evidence-based approaches for identifying and promoting areas for the generation of intellectual properties.*

### Advisory Committee:

S. No.	Name of the Member	Details
1.	Dr. K. S. Kardam,	Fmr. Senior Joint Controller of Patents & Designs. Patent Office Delhi, Boudhik Sampada Bhawan, Dwarka-14, New Delhi-110075
2.	Dr. Yashawant Dev Panwar	Scientist- E, TIFAC, Vishwakarma Bhavan 'A' wing, Shaheed Jeet Sing marg, New Delhi.-110016
3.	Shri Avinash Kumar	Adjunct Professor & Head, IPR Cell, Sharda University, Gr NOIDA Fmr. Addl Director (IPR), DRDO (HQ) Ministry of Defence, New Delhi, Govt. of India
4.	Mr. Jitin Talwar	Attorney, Patent Agent, Founder XLPAT - TT Consultants-Talwar Advocates Bestech Business Tower, Mohali-160055
5.	Dr. H. Purushotham	IPR Chair Professor & Fmr CMD, NRDC Andhra University, Visakhapatnam, Andhra Pradesh 530003

### Studies conducted related to Intellectual Property (IP), Period: 2015-22

S. No.	Title of the Study Conducted	Year
A	Comparative study on selected Asian nations based on global S&T indicators	2015-16
B	Study on patents ecosystem on India based on annual reports of WIPO, Geneva and IPO, Mumbai	2015-16
C	Patents and utility model (UM) regime in India (based on national and international reports)	2016-17
D	Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India	2016-17
F	Feedback study on selected HEIs for Enhancing IPR Regime in India	2016-17
F	International Classifications of patents to the 904 institutions studied	2017-18
G	Working/non-working status of patents granted to HEIs and NRLs in India	2018-19
H	Intellectual Property: A Primer for Academia	2020-21
I	Animated Video Presentation	2021-22

### Introduction

Innovation and creativity result in inventions that serve as a significant catalyst for technical growth, ultimately resulting in industrial development and the country's economic well-being. Intellectual property has a greater significance in the economy. As renowned businessman Mark Getty put it, "*IPs are the new oil that fuels the economic prosperity of a nation in the twenty-first century.*" This was claimed while the UK was in the midst of an economic crisis in the 1980s, and the economy was saved by profits generated by North Sea oil, and oil became

the UK's wealth saviour. With governmental interventions, attitude shifts, and market growth centred on a nation's assets, IP is critical for emerging countries like India to generate prosperity and reputations in order to realise goals such as Atamnirbhar Bhart and the Make in India mission. United States (US) has set an example for valuing IP and believing in mind-set of “*fail fast*” rather than “*don't fail at all*”. The developing countries like India has a huge potential to become a technology based country if IP are explored commercially for the socio-economic development.

In India the patent system administered in India comes under the office of the Controller General of Patents, Designs and Trademarks (CGPDTM) under the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry. The jurisdiction of Indian patent system is divided geographically into four regions i.e. Northern Region (Patent Office, Delhi), Western Region (Patent Office, Mumbai), Southern Region (Patent office, Chennai) and Eastern Region (Patent Office, Kolkata), which also houses the national head office. The amendments brought in 2005 have spurred tremendous growth in the patenting activities because before 2005 only process patents were protectable and after this amendment product patents are also protected.

As per the ‘The Patent Act, 1970’, a patent is an exclusive and territorial right granted by regional or national government. Once granted, it remains valid for a maximum period of 20 years from the date of filing of the application, provided the periodic maintenance fees are duly paid during this period and the patent is not revoked or declared invalid by a court. The history of the Indian IP system dates back to the pre-independence era of British rule. The first patent related legislation in India was Act VI of 1856, adapted from the British Patent Law of 1852. The most critical step taken for the protection of innovation under a legislative law, was in 1970 when the Government of India enacted 'The Patent Act, 1970'. Further to fortify the dedicated system for inventions, subsequent amendments were also made in 1999, 2002, and 2005. In 1994 India signed the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement. Another defining moment in the patenting came in 1998 when India became a signatory to the Patent Cooperation Treaty (PCT). As a result, inventors can now protect their inventions internationally through a single application. On January 1, 2005, India became fully TRIPS-compliant by bringing into effect its most crucial requirement of enforcing product patents in the fields of food, chemical substances, and pharmaceuticals. Before the TRIPS agreement, patents were exclusively governed by national jurisdiction, subject to local laws framed according to the national development goals and local needs.

As per the latest annual report released by the office of CGPDTM in January 2022, a total of 56,267 patent applications were filed with Indian Patent Office (IPO). During 2019-20 the patents applications filing was 20,843 applications by Indian residents, which is only 37.5% of the total filings in India. The rest of the applications have been filed by Non-Residents (i.e. applicants from other countries through ordinary applications, national phase or convention applications). The top filing countries in India are USA (10,564), Japan (4,908) and China (3,433). Among the Common Wealth Countries, UK filed the maximum applications in the year 2019-20 i.e. 959 through national phase, convention applications and as ordinary applications followed by Australia (316).

So, the main concern is the patents being filed by the residents of India. As mentioned previously, only 37% of patents filed in India are by Indian residents' rests are by foreign applicants. Outside countries are filing maximum patents in India through national phases and convention applications. The abysmal patent filing regime in India is attributed to many factors like policy gaps at the national, regional or institutional level, lack of awareness among inventors/researchers, lack of funding & institutional support, fewer collaborations between university-industry and the absence of dedicated IPR/tech. transfer offices, etc. The most crucial is the lack of awareness and those who are aware, are hesitant in patent filing as the process of patent filing is very time consuming and costly too for an individual. So, the first intervention needed is the streamlining the time and process of filing patents and focusing more on awareness of IP filing and associated IP rights. The issues mentioned above need to be addressed at the central, state, and institutional level to encourage researchers for IP protection and its commercialization. Involvement of industries and industrial associations in the IP commercialization is the paramount and should be encouraged to participate more and more with the academic strata.

some crucial initiatives need to be taken on the institutions level such as every institution should have dedicated IPR policy with proper guidelines on revenue sharing in case of patent/technology commercialization, guidance for patent/technology management procedures, clarity on ownership criteria, transparency in decision-making process, etc. This initiative will give confidence to the researchers to get involved in active research and they will get their due amount for their hard work and efforts they have rendered in. Recently CIPAM, which is a dedicated body to implement National IPR Policy, has created a draft on 'MODEL GUIDELINES ON IMPLEMENTATION OF IPR POLICY FOR ACADEMIC INSTITUTIONS' with the prominent objectives like protecting IP rights generated by faculty

and students of the academic institution, laying down fair and transparent administrative process for ownership control, and sharing of IP generated revenues, promoting collaborations between academia and industry, and establishment of an IP cell for supporting innovations of students, research scholars, and faculty members. A special scheme is initiated by DPIIT, Govt of India i.e. Start-ups Intellectual Property Protection (SIPP), which aims to promote awareness and adoption of Intellectual Property Rights amongst Start-Ups. Scheme is inclined to nurture and mentor innovative and emerging technologies among start-ups and assist them in protecting and commercialize it by providing them access to high-quality IP services and resources.

However, the trajectory of growth in patents filing by residents and technology commercialization is picking up momentum at a slower pace in India. It may be remarked that there is an urgent need for a shift in the mind-set of the academic fraternity, from paper publication towards patenting and then commercializing it. Think tanks and policy makers believe that, universities and higher educational institutions in India are the two founding pillars of a nation's economy. An academic institution is deemed successful if the knowledge imparted to the students finds its way as a tangible or non-tangible property through innovation. Further, with increase in the value being assigned to '*patents filed*', '*patents granted*', '*patents commercialized*', etc. during the rankings of institutions, it has become imperative for academic institutions to shift their focus towards innovations-oriented results. Although considering only patents generation to analyze the technological advancement or innovation index of a nation may not be appropriate, countries giving more emphasis to open science and innovations are leading in technological advancement as well.

#### **A. Comparative study on selected Asian nations based on global S&T indicators**

**Highlights:** The study was a comparative study of five selected Asian countries including India

*Findings: It was found that as India being one of the largest nation based on area and education system, is lagging behind other Asian nations in parameters like publications, H-index and IP generation.*

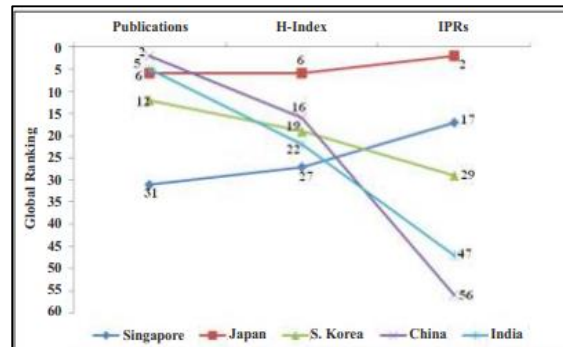
based on Global Competitiveness Index, 2016. Based on the comparisons among these Asian economies, it was found that Singapore (Rank-2) had made remarkable economic progress and was amongst the top five successful economies of the world. Taiwan, South Korea and China also have taken significant economic strides and were ranked globally at 15, 26 and 28, respectively. India, on the other hand, was ranked 55 out of 140 nations.

## Basic details of the Asian courtesies

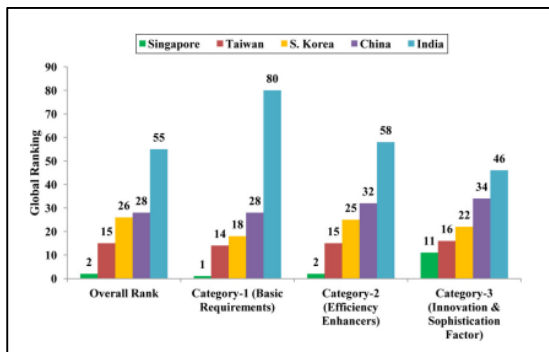
Attributes	Singapore	Taiwan	S. Korea	China	India
Independence	9 August 1965	No official day	15 August 1948	1 October 1949	15 August 1947
Population <sup>a</sup> (billions)	0.057	0.02343 <sup>b</sup>	0.504	1.364	1.295
Land area <sup>a</sup> (square kilometres)	707	36,195 <sup>c</sup>	97,466	9,388,211	2,973,190
Government type	Parliamentary Republic	Multi-party Democracy <sup>c</sup> (semi-presidential)	Presidential	Autocratic Socialist	Federal Republic
Economy type	Free market	Capitalist economy	Market economy	Socialist market	Mixed economy

Notes: <sup>a</sup>World Bank - 2014 ([www.worldbank.org](http://www.worldbank.org)); <sup>b</sup>Trading economy ([www.tradingeconomics.com/taiwan/indicators](http://www.tradingeconomics.com/taiwan/indicators)); <sup>c</sup>[www.taiwan.gov.tw](http://www.taiwan.gov.tw)

## Ranking in select S&T parameters



## Ranking based on GCI Report, 2016-17



## R&D indicators of Asian countries

Attributes	Singapore	Taiwan	S. Korea	China	India
Life expectancy <sup>a</sup> (years)	82.3	80	81.5	75.4	66.5
Human Development Index (HDI) <sup>b</sup>	0.912	0.882 <sup>c</sup>	0.898	0.727	0.609
Literacy rate over 15 years <sup>c</sup> (%)	96.8	98.5	97.9	96.4	71.2
GDP <sup>d</sup> (US\$ trillion) 2014	0.31	0.53 <sup>e</sup>	1.41	10.35	2.05
GDP growth <sup>d</sup> (annual %)	2.9	-0.68 <sup>f</sup>	3.3	7.3	7.3
Urban population <sup>g</sup> , 2014 (% of total population)	100	78.0 <sup>g</sup>	82	54	32

Notes: <sup>a</sup>The Global Competitiveness Index 2015-2016; <sup>b</sup>The Human Development Index (HDI-2015); <sup>c</sup>The World Fact Book 2015; <sup>d</sup>World Bank - 2011-2015 ([www.worldbank.org](http://www.worldbank.org)); <sup>e</sup><http://focus.taiwan.tw/news/asoc/201409180039.aspx>; <sup>f</sup>[www.tradingeconomics.com/taiwan/gdp-growth-annual](http://www.tradingeconomics.com/taiwan/gdp-growth-annual); <sup>g</sup>[https://en.wikipedia.org/wiki/Urbanization\\_by\\_country](https://en.wikipedia.org/wiki/Urbanization_by_country); United Nations does not recognize Taiwan as a sovereign state; Taiwan is not listed as a separate country for world development indicators

**Paper Published in 2017:** Mamta Bhardwaj, Ajit Singh Naosekpm, Rupinder Tewari  
 Comparative study of Asian economies: lessons for India. Journal of Science and Technology Policy Management, DOI 10.1108/JSTPM-07-2016-0013.  
<https://www.emerald.com/insight/content/doi/10.1108/JSTPM-07-2016-0013/full/pdf>.

## B. Study on patents ecosystem on India based on annual reports of WIPO, Geneva and IPO, Mumbai

**Highlights:** The study was conducted to understand the national and international IP ecosystem

*Findings: Based on this study, it was found more than 75% percent of patents applications are being filed by the foreign residents in India and USA tops the list as foreign applicant.*

and functioning of these organizations. It was found that India is lagging behind other Asian countries like China, S. Korea, and Japan in the patents generation. On national scale, Indian Institutes of Technology (IITs) filed the maximum number of patent applications at Indian patent office.

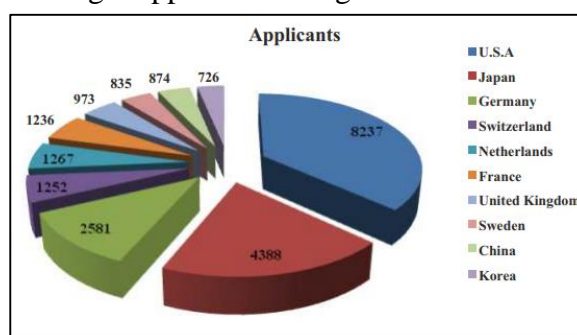


## Comparative Study of Asian Countries

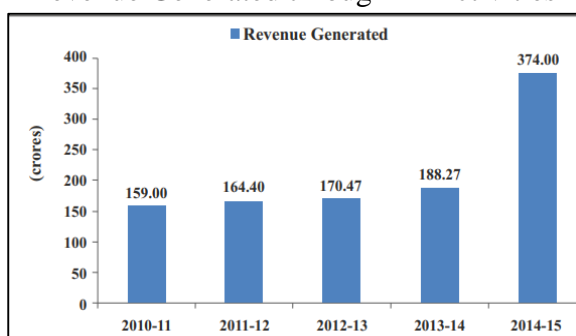
S. No.	Indicators	Global Rankings					
		Singapore	Japan	S. Korea	China	India	
1.	IP Filing Rankings* (resident & abroad)	Patents	26	3	4	1	14
2.	IP Filing Rankings** (residents)	Patents	30	3	4	1	11
3.	Number of Patent Applications by Office of the Country	Total	10,312	3,25,989	2,10,292	9,28,177	42,854
		Residents	1,303	2,65,959	1,64,073	8,01,135	12,040
		Non-residents	9,009	60,030	46,219	1,27,042	30,814

\* Out of 100 economies, \*\*out of 80 economies  
 Source: World Intellectual Property Indicators (www.wipo.int/ipstats, http://www.wipo.int)

## Foreign Applicants Filing Patents in India



## Revenue Generated through IP Activities



## Top Applicants in Academic Sector

S. No.	Name of Institute/University	Applications Filed
1.	Indian Institute of Technology (Collective)	337
2.	Janardan Rai Nagar Rajasthan Vidyapeeth (Deemed) University, Udaipur	53
3.	Indian Institute of Science, Bangalore	46
4.	Amity University, Noida	43
5.	Sandip Foundations: Sandip Institute of Technology & Research Centre, Mumbai	33
6.	Hindustan Institute of Technology & Science, Chennai	31
7.	SAL Institute of Technology & Engineering Research, Ahmedabad	22
8.	Sandip Foundations: Sandip Institute of Engineering and Management, Mumbai	21
9.	Siddaganga Institute of Technology an Institution of Sree Siddaganga Education Society, Tomakuru, Karnataka	19
10.	Karpagam University, Coimbatore.	18

Source: IPO Annual Report 2014-15

### 1. Book Chapters Published in 2017: Industry-Academia R&D Ecosystem in India (2017)

<https://cpr.puchd.ac.in/wp-content/uploads/2017/05/Industry-Academia-RD-Ecosystem-in-India.pdf>.

## C. Patents and utility model (UM) regime in India (based on national and international reports)

**Highlights:** This study was done in collaboration of Dr. K S. Kardam, who is one of the

*Findings: Protection of utility patents under the Indian patent Act is the need of the hour which is currently not the case. Many countries like China, Japan, USA, etc. are promoting and securing small innovations through utility patents.*

committee members for the objective related to IP. The study was done to understand the scope of protection of 'utility patents' under the Patent Act of India. These small innovations, which are also termed as petty patents' or 'innovation patents' or 'minor patents' or 'small patents' are not

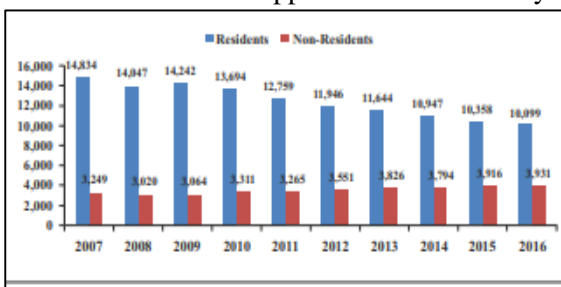
protectable in India. **It was suggested that such patents can be very much helpful to the economic growth of the country and SMEs are the most crucial stakeholder for the commercialization of such small innovations.**

### Global trend of UM Applications in Japan

Year	Patents	Industrial Designs	Utility Models
2007	508,263	102,665	10,750
2008	509,990	107,108	9,936
2009	463,601	86,406	9,917
2010	468,417	102,977	9,385
2011	475,051	127,795	9,634
2012	490,271	120,761	10,902
2013	473,141	112,225	10,919
2014	465,971	112,295	10,404
2015	457,952	105,746	9,947
2016	456,467	119,141	8,910

Source: [http://www.wipo.int/ipstats/en/statistics/country\\_profile/profile.jsp?code=JP](http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=JP)

### Global trend of UM Applications in Germany



### Global trend of UM Applications in S. Korea

Year	Patents	Industrial Designs	Utility Models
2007	1,76,336	76,893	21,269
2008	1,73,496	78,576	17,621
2009	1,70,233	77,201	17,333
2010	1,78,654	85,853	13,957
2011	1,87,747	86,397	12,165
2012	2,03,836	1,13,250	12,853
2013	2,23,527	1,54,148	11,300
2014	2,30,553	1,27,828	9,606
2015	2,38,185	1,35,438	9,512
2016	2,33,786	1,33,598	8,739

### Global trend of UM Applications in Australia

Year	Patents	Industrial Designs	Utility Models
2007	11,992	11,884	1,266
2008	12,152	11,227	1,297
2009	10,656	10,943	1,365
2010	11,559	12,315	1,535
2011	11,536	16,709	1,763
2012	11,719	21,132	1,930
2013	12,515	17,955	1,744
2014	11,903	16,480	1,622
2015	11,239	12,672	1,924
2016	11,735	12,000	1,973

Book Chapter Published in **Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India** (2018).  
<https://dst.gov.in/sites/default/files/FULL%20BOOK-Chandigarh.pdf>.

### D. Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India

- COMPOSITE ANALYSIS OF ALL TYPE OF INSTITUTIONS CONSIDERED FOR THE STUDY
- INSTITUTIONS OF NATIONAL IMPORTANCE
- TOP 100 NIRF UNIVERSITIES
- TOP 100 NIRF ENGINEERING INSTITUTES
- TOP 50 PRIVATE UNIVERSITIES
- TOP 50 NIRF PHARMA INSTITUTES
- NATIONAL RESEARCH LABORATORIES

**Highlights:** India's dream of becoming a strong and developed nation cannot be fulfilled unless

*Findings: There is a lack of translational research ecosystem in Indian academic sector. Researchers are more inclined towards publishing their research findings instead of securing it through patents*

India improves its ranking in the domain of patents and technology transfer. In order to achieve this, it is imperative that we understand the ecosystem of Research and Development (R&D) of Higher Education institutes (HEIs) and R&D labs in India. Keeping this in mind, Department of Science & Technology (DST)-Centre for

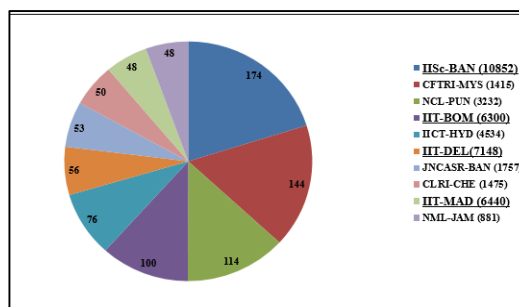
Policy Research (CPR) at Panjab University, Chandigarh undertook a study to analyse the research publications and patenting profile of more than 900 institutes of India comprising of top HEIs (351) and all national R&D institutions (553). The HEIs comprise of Institutions of

National Importance (INIs), universities, engineering institutes, pharma institutes and private universities based on the national rankings released in 2016. The national R&D labs, included in this study, have been established under 27 ministries of Govt. of India and 2 independent departments under Prime Minister of India.

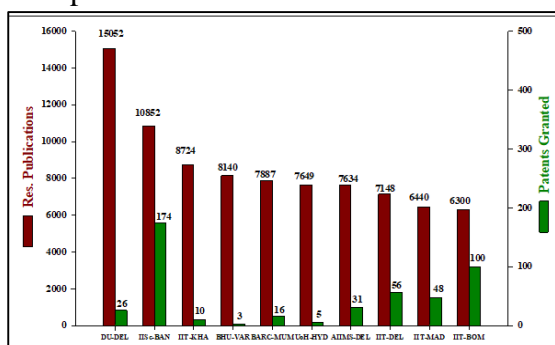
#### Institutes excelling in both parameters

S. No.	Institute	Res. Publications	Patents Granted
1	DU, New Delhi	15052	26
2	IISc., Bangalore	10852	174
3	IIT, Delhi	7148	56
4	AllMs, New Delhi	6591	31
5	IIT, Madras	6440	48
6	IIT, Bombay	6300	100
7	IIT, Kanpur	5622	44
8	IICT, Hyderabad	4534	76

#### Top 10 Institutions in Patents granted



#### Top 10 Institutions in Res. Publication



#### Patent Profile of Top 100 NIRF Universities

Universities	Patents Granted (%)
State Universities (44)	72 (22.22%)
Private Universities (24)	20 (6.17%)
Central Universities (32)	232 (71.60%)
<b>Total Universities (100)</b>	<b>Total Patents Granted - 324</b>

Published as a book entitled **Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India** in 2018 released on Technology Day in 2018. <https://dst.gov.in/sites/default/files/FULL%20BOOK-Chandigarh.pdf>.

### E. Feedback study on selected HEIs for Enhancing IPR Regime in India

**Findings:** *Handful of Universities in India have dedicated IP policies and cells to assist researchers in IP filing and registration. Additionally they are very less number of collaborations with industries.*

**Highlights:** In order to strengthen the patent regime of institutes, especially those which are excelling in research publications, but low on patents, DST-CPR prepared a 'Questionnaire' which was sent to 36 HEIs (10 IITs, 15 Universities

and 11 other institutes). It was found that institutions do not have dedicated technology transfer cells, active I-A collaborations and dedicated IP policies in place to assist students in the process of IP filing and registration.

### Translation Research Ecosystem

S. No.	Institution	IPR Cell	Tech. Transfer Cell	Entrepreneurship Cell	Industry-Academia Cell
1.	IIT-Bombay	✓	✓	✓	✓
2.	IIT-Kanpur	✓	✓	✓	✓
3.	Manipal University-Manipal	✓	✓	✓	✓
4.	NIPER-Mohali	✓	✗	✗	✗
5.	AIIMS-New Delhi	✓	✗	✗	✓
6.	IIT-Guwahati	✓	✗	✓	✓
7.	PSG College of Technology-Coimbatore	✓	✗	✓	✓
8.	IISER-Pune	✓	✗	✓	✗
9.	IIT-Indore	✓	✓	✓	✓
10.	UoH-Hyderabad	✓	✗	✗	✗
11.	PU-Chandigarh	✓	✗	✓	✓
12.	AMU-Aligarh	✓	✗	✓	✓
13.	Sathyabama University-Chennai	✓	✓	✓	✓
14.	JNU-New Delhi	✓	✗	✗	✗
15.	BHU-Varanasi	✓	✓	✓	✓
16.	IIT-Roorkee	✓	✓	✓	✓

### Industry - Academia (I-A) Collaborations

S. No.	Institution	Number of I-A Collaborations
1.	AIIMS-Delhi	06
2.	IIT-Bombay	450
3.	IIT-Kanpur	223
4.	NIPER-Mohali	22
5.	IIT-Roorkee	0
6.	IIT-Guwahati	374
7.	PSG College of Technology-Coimbatore	150
8.	IISER-Pune	4
9.	IIT-Indore	2
10.	Manipal University-Manipal	176
11.	UoH-Hyderabad	74
12.	PU-Chandigarh	89
13.	AMU-Aligarh	18
14.	Sathyabama University-Chennai	85
15.	JNU-Delhi	0
16.	BHU-Varanasi	1

Book Chapter Published in **Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India** (2018).  
<https://dst.gov.in/sites/default/files/FULL%20BOOK-Chandigarh.pdf>.

### F. International Classifications of patents (filed and granted) to the 904 institutions studied

**Highlights:** The classification is indispensable for the retrieval of patent documents in the

*Findings: Out of the total 12, 402 patents (published & granted) 9074 (72.16%) are in application phase and 3328 (26.83 %) are granted to the Indian institutions taken for the study. Top three domains of the patents were humans' necessities, performing operations and Chemistry.*

search for "prior art." Such retrieval is also needed by patent-issuing authorities, potential inventors, research and development units, and others concerned with the application or development of technology. DST-Centre for Policy Research at Panjab University,

Chandigarh has collected data for Indian Higher Education Institutes and national R&D labs for the period 2010-16. Out of the total 12, 402 patents (published & granted) 9074 (72.16%) are in application phase and 3328 (26.83 %) are granted to the Indian institutions taken for the study. In the present study, 12,402 patents (published and granted) by Indian HEIs and national R&D labs for the period 2010-16, have been classified, based on IPC codes. The Centre believes that this will facilitate industries and researchers by providing a hassle free and easy access of the knowledge of the academia.

## Main IPC Classes of the Patents

S. No.	IPC Codes	No. of Patents (2010-16)
1.	A - Human Necessities	3456
2.	B - Performing Operations; Transporting	1669
3.	C - Chemistry; Metallurgy	5519
4.	D - Textiles; Paper	191
5.	E - Fixed Constructions	164
6.	F - Mechanical Engineering; Lighting; Heating; Weapons; Blasting	425
7.	G - Physics	1739
8.	H - Electricity	1394
9.	L - Definition Not Available	1
10.	Y - General Tagging of New Technological Developments; General Tagging of Cross-Sectional Technologies Spanning Over Several Sections of the IPC; Technical Subjects Covered by Former USPC Cross- Reference Art Collections [Xraes] And Digests	14

*Note: There is a possibility that one patent can fall under 2 or more classes*

Book Chapter Published in **Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India** (2018).  
<https://dst.gov.in/sites/default/files/FULL%20BOOK-Chandigarh.pdf>.

### G. Working/non-working status of patents granted to HEIs and NRLs in India

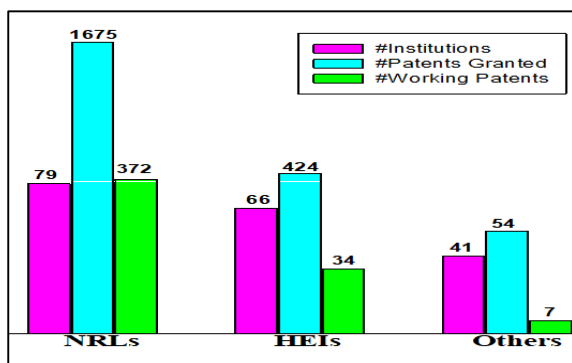
**Highlights:** Universities are the prominent pillar of a nation's economy. An academic

*Findings: Indian applicants /patentees/assignees are not providing patents' working details in prescribed form-27. Those who are providing are citing very casual and non-serious reasons for the non-working of the patents.*

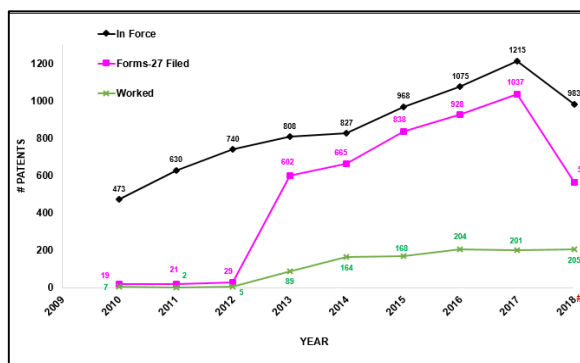
institution is deemed successful if the knowledge being imparted to the students finds its way as a tangible or non-tangible property through an innovation. However, intellectual think tanks believe that the main focus of the academic sector in India is to publish their research instead of securing it

through the patents' rights. This study reveals the patents commercialization ecosystem in Indian higher education institutions and national R&D labs. On the basis of this research the centre has drawn some recommendations to enhance the patents commercialization ecosystem in India.

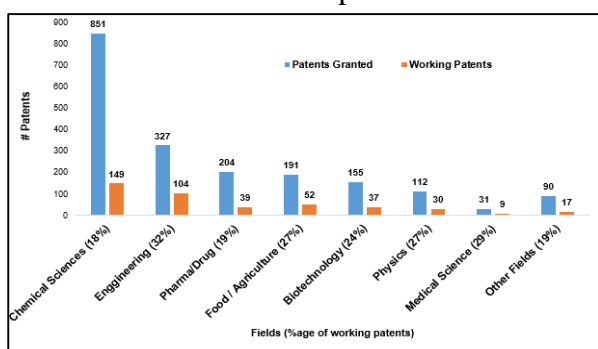
### Breakup of Granted and Working Patents



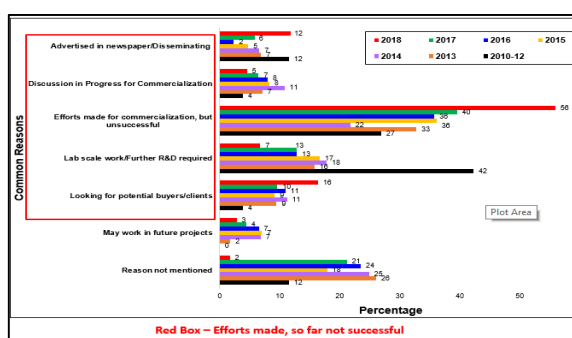
### Year wise Categorization of Patents



### Domains-wise Breakup



### Common Reasons for Non-Working



Published as Reports (submitted to DST, New Delhi and published as research papers in **Current Science** and **NISCAIR-JIPR**. (<https://www.currentscience.ac.in/Volumes/120/01/0034.pdf>), <http://nopr.niscair.res.in/bitstream/123456789/58375/1/JIPR%2026%284%29%20199-207.pdf>.

## H. Intellectual Property: A Primer for Academia

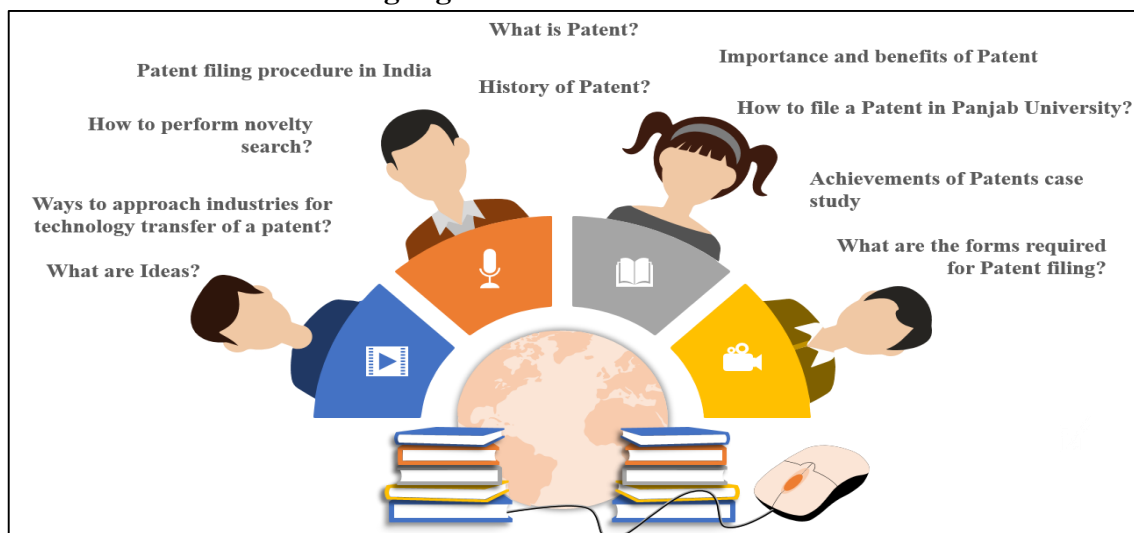
**Highlights:** India is among the top 5 nations when analyzed on the parameter of research

*Findings: Based on the various interactions and studies done by the Centre, it was realized that there is a need of the knowledge dissemination on IP and related rights in academic institutes in India. So considering the fact, this primer was planned to intruduce researchers about basic knowledge of IP and ecosystem in India.*

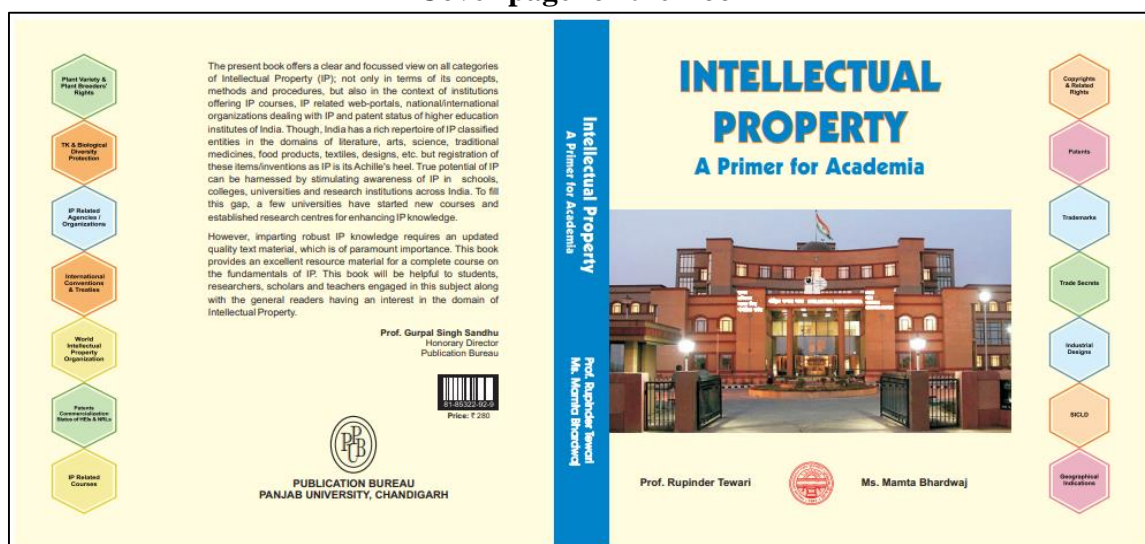
publications, but lags behind in patents’ generation. One of the reasons for this variation is the lack of patent awareness and knowledge among the teaching/research community of the academic institutions. To address the same, the Centre is working on developing an

‘IPR Toolkit’, exclusively for universities and institutes of higher education in India. The ‘Toolkit’ is the need of the hour and Centre is of the view that it will help Indian academic sector to enhance their translational research eco-system.

## The highlights of the contents of the book



## Cover page for the Book



A book entitled '**Intellectual Property: A Primer for Academia**' was released on Friday, September 24, 2021 by Professor Raj Kumar, Vice Chancellor, Panjab University, Chandigarh.  
**Link:** <https://dst.gov.in/sites/default/files/E-BOOK%20IPR.pdf>.

### I. Animated Video Presentation

#### Highlights:

*Findings: Preparation of a detailed and interactive 'Video Presentation', to sensitize researchers in Panjab University about proper channels of taking the research work from lab to Indian Patent Office and then to market.*

In the studies mentioned in the previous sections, it was found that a handful of the institutes and universities are performing well in both parameters (research publications & Patents filing/granted), whereas, most of the institutions are lacking in patents profile despite the fact that the researchers in those

institutions were doing good research and are publishing credible number of papers. In the case studies conducted by the centre, it was found that the major reason for the poor IP ecosystem in educational institutions was the lack of awareness on IP issues. Therefore, this project has been taken up to create awareness among the students and faculty of the University.

### Glimpses of animated video for the awareness of patents filing from PU, Chd.

**Welcome to DST-Centre for Policy Research, Panjab University, Chandigarh. We are here to help you to be aware about various topics of Intellectual Property Right (IPR)**

**Let us begin with learning about the process involved, documents and time required to file a patent through CIIPP at Panjab University**

**HOW TO FILE A PATENT THROUGH PANJAB UNIVERSITY FREE OF COST**

**Are you a researcher of Panjab University and working on some important projects?  
If yes, do you know that your novel research which has industrial application needs protection from infringers?**

**Getting your invention secured through a patent will protect your work and also can get financial benefits with your innovation or invention  
If you are a scientist working under Panjab University, you can file a patent free of cost through CIIPP or through a private attorney.**

Link: [cpr.puchd.ac.in](http://cpr.puchd.ac.in)



## **Ongoing Activity**

A comprehensive Case Study on innovation and collaboration ecosystem in universities in the Northern region states of India through actors such as knowledge, resources, technologies, patents generation and commercialization in various domains of technology.

**States/UT to be considered:** Jammu & Kashmir, Himachal Pradesh, Punjab, Uttarakhand, Haryana, Rajasthan, Uttar Pradesh, Delhi, Chandigarh

### **The overall Study shall be through**

- a) *questionnaire based surveys*
- b) *Personal interviews with the Heads of respective Institutes/Heads of Innovation cells/inventors/researchers, etc.*
- c) *Data collection from various sources (online/offline) or may be outsourcing*

### **Outcome of the Study:**

1. This study aims to **develop a framework for enhancing translational research, innovation ecosystem resulting** in startups, and inculcating a culture of entrepreneurship among future researchers.
2. The study shall help validate the factors believed to drive innovation in an institute and also identify other factors contributing towards innovation achievement, such as **policy/guidelines/outreach/incentives/alumni/industry connect**, etc.
3. The study also aims to **identify the reasons behind successful Industry-Academia collaborations** or vice-versa as IP is useful only when it can reap commercial benefits, which mostly comes through addressing actual industry problems and providing practical solutions.
4. To study if universities/institutes have strong set of policies/guidelines in place, such as technology transfer guidelines, IPR policy, etc. and a mechanism to implement the same, such as entrepreneurship cell, I-A cell, IPR cell, etc. **Identify the best practices for the formulation of such policies and mechanisms to implement them at other universities and HEIs** which are lacking in this.

**Ultimate Aim of the Project:** A model for enhancing translational research ecosystem through I-A collaborations and triple helix model.

## **Recommendations:**

The abysmal patent regime in India is the result of a lack of awareness among inventors/researchers and the absence of dedicated IPR/tech. transfer policies. Most prominent is the lack of awareness and those who are aware, they are hesitant in patent filing as the process of patent filing is very time consuming and costly too. So, first intervention should be of streamlining the time and process of filing of patents. As of awareness about IPR, there should be at least an introductory chapter about IPR at the school level. Below mentioned are some policy interventions on patents generation and commercialization, which need to be incorporated in new Science, Technology and Innovation Policy, 2020 of India to enhance translational research ecosystem in higher education institutes.

The studies conducted at DST-CPR emphasize that patenting of research outcomes should be recognized as a more lucrative option by academic institutions. However, the trajectory of growth still is picking up momentum at a slower pace. It may be remarked that there is an urgent need for a shift in the mind-set of the academic fraternity, from publication towards patenting. Further, even the institutes performing reasonably well in getting patents granted, are not able to commercialize or take full benefits of the patents. There is still a dearth of IPR awareness, which is crucial to graduate from publications to patenting.

Another crucial aspect is commercialization of patents. One of the study compiled by the CPR suggests that the percentage of working patents vs. granted patents for NRLs is 22% whereas for HEIs it is only 8%. The Average percentage of working patents in Indian academic and research sector is only 14%. One of the most common reasons for non-working of patents is the limitation of research to 'lab-scale work', which can only be overcome once we start focusing not only on basic research but also on advance technological research.

India is the world's second-most populous country, accounting for 17.7% of the worldwide population, with more than 50% of the population under the age of 25 and more than 65 % under 35. Also, India's education system is the world's second-largest, with more than 1000 research institutions and 40,000 colleges in the country. Moreover, according to the India Brand Equity Foundation (IBEF), around half of India's population is under the age of 25, and the country is expected to have the world's largest workforce by 2027. By then, a billion people in India will be between the age of 15 and 64. Today's youth, not just in India but throughout the world, possesses an enormous capacity for creativity and ingenuity that has yet to be fully realised and explored. It is already transforming approaches and driving action in the direction of innovation and change as a result of their fresh perspectives, energy, curiosity, and "can do"

attitude, as well as their aspirations to make the world a better place. India has all the wherewithal to be one of the top countries in the innovation and IP ecosystem. In conclusion the main reasons for low IP ecosystem are:

- **Creation of an Indian Patent Trust System:** Patents are of no value unless the commercial worth of the product or technology is demonstrated and exploited. Many patentable inventions have failed not because they didn't work, but because the inventor was unable to exploit them commercially, because of lack of knowledge and resources. If an institution or an individual is unable to utilize/commercialize the patent, they should entrust their patent to a specialized agency for its management, utilization or disposal as is practised in S. Korea. (<http://nopr.niscair.res.in/bitstream/123456789/34014/1/JIPR%2021%281%29%2027-37.pdf>). In 2008, S. Korea established a specialised agency (Patent Trust System, PTS) to facilitate technology transfer and commercialization in the country. This agency works only for dormant patents which have not been utilised for a long time. Patent Trust is defined as 'an arrangement whereby the inventor transfers the patent to a trustee, who is responsible or commissioned to manage or dispose of the patent for the truster's interest'. By virtue of this facility, any institution (universities, public research laboratories and SMEs) that lacks financial resource or capability to protect the patent and is unable to utilise or commercialise the patent may handover the technology or a patent to this specialised agency for its management. ***It is suggested that Indian PTS may be created to probe the potential of commercialization of patents which are ideal, abandoned, expired, and disposed of at patent offices.***
- Another alternative may be the ***creation of a collaborative mechanism of already existing IP organizations in India. The existing organizations like NRDC, New Delhi; TIFAC, New Delhi, CGPDTM, Mumbai, DST's State Science Councils, DSIR, New Delhi and MSME, New Delhi, etc. can develop a collaborative mechanism to enhance IP/technology commercialization of the academic sector in India.*** The benefits of creation of such mechanism are:
  - ✓ *The inventors/scientists can rely on this agency and can enjoy perks of royalty without worrying about the lengthy and cumbersome process of IP filing or IP management. They can concentrate on their research.*
  - ✓ *Resultantly the technology commercialization will be increased and that can impact the societal and economic development of the nation.*

- ✓ *IP filing and management will be streamlined as there are many pending applications at IP offices for clearances.*
- ✓ *It will stimulate the utilization of abandoned/rejected patents and will encourage the inventors.*
- ✓ *It will increase trust between the industry and academia and further the economic and moral values of the SMEs and Academic sector will be improved. These I-A collaborations will enhance the indigenous technology commercialization and this will address the issues pertaining to employment of youth.*
- ✓ *Through I-A collaborations, technology indigenization and commercialization, the inclusive and sustainable industrializations will be promoted.*
- **Establishing ‘IPR Academies’ in Universities:** The teaching faculty in the universities has little knowledge of IP and related rights. Unless teaching community is IPR savvy, it cannot emphasize the importance/necessity of IPR to the young students/researchers. ***It is suggested that GoI may set up 4-5 ‘IPR Academies’ in India, whose major responsibility should be to train the faculty members of each university in the domain of IPR. Each faculty member should be well acquainted with IP fundamentals,*** so that he/she not only dispenses knowledge but also provide justifiable answers to the queries raised by students/researchers.
- **The ‘IPR Academies’ can be run on self-sustainable mode.** The finances can be generated by conducting workshops/seminars and offering courses (certificate/diploma/degree) for public and private sectors including students/researchers/teachers (schools/colleges/universities) and employees of industries. These courses can be offered online as well as offline mode.
- **Introduce Patent-Insurance Scheme:** The infringement claim and defence of IPs, especially patents are a very complex and expensive process. The researchers/scientists are ill-equipped to deal with such contingencies. Larger companies with huge resources can infringe upon patents of SMEs as a market strategy to prevent them from blooming inside their niche market and posing as a potential threat to them, knowing that SMEs are not in a financial position to fight legal battles. In such a situation, patent insurance can play a major role in protecting patents from infringement and assist the inventor to fight against infringement. Additionally, during the process of licensing or commercialization, patent insurance adds credibility to the patents, since it’s issued by the insuring company after detailed investigation of its claims and values. The instrument of patent insurance is especially important for developing countries like India, where there are many small and

emerging SMEs. The same is already being practiced in the developed countries and is prevalent in USA and some European countries. China has recently (2012) started issuing patents insurance product.

- **Lucrative Weightage for IP in API framework:** The Academic Performance Indicator (API) laid down for the promotion of assistant professor to associate professor and then to full professor does not provide enough weightage to patents. A teacher can secure promotion by publishing research papers in a journals, without bothering about IP generation. Unless lucrative weightage is given to IP in the API, teaching community will not take IP matter seriously.
- **Creation of dedicated IP Fund:** In national research funding organizations like CSIR, CSIO, etc., the cost of IP filing and maintenance of a patent is borne by the respective organizations. On the contrary, it depends on the policy of an individual university/institution, whether to set aside funds for patent filing /maintenance or not. At times, the university teachers shell out money from their pockets for such activities. ***In order to promote IP activities in the sector of higher education, it is suggested that a dedicated fund be created as 'IP Fund' which could be used for IP related activities of the universities.***
- **Assessment of Research for Patent Generation:** Every educational institute ought to have a mechanism of wetting each research manuscript by an independent body for its potential patentability, before it is sent for publication in a journal. The wetting of a manuscript for patentability before publication will surely boost the number of patent filing applications.
- **Dedicated IP Cells in Universities:** ***Institutes carrying out quality research should have a dedicated I-A Cell, IPR Cell, Entrepreneurship Cell and Technology Transfer Cell. These Cells should be run by professionals,*** as in universities of developed countries. Allocating such an important task to a teaching faculty as an additional responsibility should be discouraged. In most cases, the added responsibility is bestowed upon a faculty member, who has no prior exposure to IPR, and thus is not able to do justice with the responsibility entrusted upon him/her. Let teachers/scientists concentrate on quality research and leave patent related matters to the IP experts. These cells will have following features:
  - ✓ *IP filing & Technology transfer*
  - ✓ *Monetary*
  - ✓ *Legal*
  - ✓ *Research publication vetting*

- **Knowledge Sharing between Academia and Private Sector:** By and large, the patents generated by academia are commercialized by the industries. Therefore, research being undertaken in the research laboratories of HEIs should be communicated to the industry. Also, a mechanism needs to be devised through which knowledge sharing, especially IP sharing, happens between the academia and the industry on regular basis so that they can collectively exploit each other's innovation and knowledge for the generation of quality patents and technologies. Keeping these factors in mind, industry-academia linkage becomes important for a) aiding in licensing-out patents from universities to industries and b) generation of futuristic innovations/patents. This partnership will get a big boost if angel investors, venture capitalists and/or financial institutions can also be roped in, especially when financially limited industries like SMEs are involved in industry-academia collaborations.
- **Institutional IPR Policy:** Each institute should have a dedicated IP Policy and Technology Transfer guidelines in place to assist researchers on IP filing and registration. This step is crucial for attracting industries to do business with academia.
- **Incentivisation of Individuals:** Each institute must incentivize its teaching faculty/research scholars who have generated patents/technologies. Incentivisation may be in the form of financial assistance (cash award, salary-hike, financial assistance for visits to national/international events), reducing teaching load, and honouring scientists on special occasions and so on. Regional or state-level award systems can be set up to incentivise the institutions and individuals for the creation and successful execution of technology commercialisation to encourage and motivate them.
- **Creation of a National IP Web Portal:** In India, organizations such as CSIR, ICMR, and ICAR etc. have independent IP/Technology web portals which have to be scanned individually by a scientist/industry personal, when searching for a particular patent/technology information, thus making the process very laborious. Unfortunately, there is no web portal which lists all the patents (filed/granted) in India. ***A national level web-portal or catalogue may be created, which mentions all the patents (active, abandoned, rejected and expired) and technologies developed by Indian researchers/scientists*** so that the interested stakeholders like SMEs or industries can get information on the single platform for the purpose of technology/IP commercialization and collaboration. Also, the information provided in Form-27 can be provided on the portal so that the same is accessible and searchable on the Patent office website for the industries. This kind of initiative will be a crucial step towards boosting the IP marketplace for Indian technologies

nationally and globally. It will contribute as one-stop inventory for technologies and their metadata.

- **Linking Universities with Local PICs:** Effective networking between institutions and regional/national IPR agencies is the need of the hour. For example, universities need to collaborate with at least one local 'Patent Information Cell' (PIC), established by DST's Technology Information and Forecasting Council (TIFAC) (GoI) in almost 22 states in India. (<http://pfc.org.in/index.htm>). Though, this system already exists but barring some selected states like Punjab, most of the states are not actively working on this aspects. More efforts should be made by the state councils and universities to collaborate and establish a 'Patent Nodal Centre' in the campus under the aegis of PIC, to avail financial assistance and other facilities of PIC.
- **Incentivize institutions excelling in IP:** Institutions engaged in the promotion of patent ecosystem (generation of IP, introducing IPR as a subject at undergraduate, postgraduate and pre-PhD coursework, holding symposia/seminars/workshops in IP) should be incentivized by the government by way of providing special grants to the concerned institutions. So, setting up an *institutional mechanisms is recommended, wherein dedicated fund allocation for IP sensitization, generation and commercialization activities in the academic sector to make the academia less dependent on the central government for financial assistance.*
- **Promoting Linkages between Universities, Research Laboratories and Industries:** There is direct relationship between R&D levels and patent-index of a nation. In other words, to stimulate patent profile of a nation, it has to support its R&D ecosystem prevailing in the universities, R&D institutes and industries. It is recommended that, these sectors work in a system, and not in silos. The professional collaborations in the domain of scientific research among these sectors can overcome the limitations of working individualistically. Such partnerships will help the scientists of the public sector (universities and R&D institutes) to work on real scientific challenges the industries. In return, the industry would be benefitted by the intelligentsia of the public sector for the development of futuristic innovations for commercial and societal gains. Universities have enormous scientific talent and enthusiastic manpower but limited in the scientific infrastructure. This limitation can be overcome by developing linkages with national research laboratories, which are equipped with sophisticated instruments, but low on manpower. Such *tripartite partnership will definitely boost the levels of applied research/*

*patents/ technologies in India, without pumping in additional funds by the funding agencies.*

- **Patents and Technology fair should be organised to intensify patent commercialization ecosystem.** Patent and technology fairs wherein all the stakeholders working in the field of patents can come together in order to display their success stories and discuss their challenges so as to promote the culture of IP, such as *Patent Information Fair & Conference* held in **Japan** (<https://pifc.jp/2019/eng/>).
- **Compulsory license should be practiced on a serious mode.** Defined as ‘authorizations permitting a third party to make, use, or sell a patented invention without the patent owner’s consent if it is not commercialized after the 3 years of its grant’, compulsory license should be promoted among SMEs and generic drug making companies. This will enhance the IP commercialization ecosystem and industries will be more interested to take up the IPs for the commercial purpose. The issues hampering the commercialization of patents/technologies along with the provision of 'Compulsory Licensing' should be addressed and administered significantly with the assistance of the concerned departments. In order to explore the potential of un-explored patents across the academic/research institutes, revival or expansion strategy should be initiated.
- ***A clause may be added in the ‘Form-27’ to ask patentee about specific requirements and potential industry/SME which can take up his/her IP for commercialization.*** Like the provision provided by WIPO for PCT applications wherein an Applicant can highlight his interest in concluding licensing agreements, Form-27 can also include an option wherein the patentee can mark their patent for licensing, or any specific requirement they are looking for, in order to commercialise their patent. Similarly, USPTO also provides the Applicants/Patentee with an option to put their patents for sale or license.
- **CGPDTM should establish a dedicated cell to look after Form-27 filing issues.** Considering the ambiguities revolving around information to be filled in Form-27, the Indian Patent Office can set up a dedicated cell which can address the reasons mentioned in the form for the non-working of the patent. Further, the patent office can issue **Guidelines** for filling Form-27 and can put answers to frequently asked questions (**FAQs**) on their website for understanding purpose. Additionally, the patentee should have the option to categorise reasons for not working, like the reasons beyond the control of patentee, such as awaiting government clearance or regulatory issues. These reasons can then be looked into by a dedicated cell.



- Necessary amendments in IP Rules/Acts are required to secure and promote small and frugal innovations by introducing a less stringent IP protection mechanism like ‘Utility Models’ in the interest of small and medium scale industries.

**Glimpses of some events and meetings:**



**National Symposium on -‘Significance of Science Communication and Intellectual Property’**



**Release of Animation Video on IP Sensitization at Office of VC at PU, Chandigarh**

**Mapping Patents and Research Publications of Higher Education Institutes and National R&D Laboratories of India**

Study Compiled by  
**Prof. Rupinder Tewari**  
**Ms. Mamta Bhardwaj**  
DST-Centre for Policy Research,  
Panjab University, Chandigarh

**Industry-Academia R&D Ecosystem in India.....an evidence based study**

Prof. Rupinder Tewari

Study compiled by  
**Prof. Rupinder Tewari**  
DST Centre for Policy Research  
at  
Panjab University, Chandigarh

DEPARTMENT OF PUBLIC RELATIONS,  
PANJAB UNIVERSITY, CHANDIGARH

News Clippings Dated:- 25 SEP 2021

**Book launch**

**Amar Ujjala**

बौद्धिक संपदा पर लिखी पुस्तक का चौथी में विज्ञान विभाग में

**AJIT**

डॉ.पी. के. बंधुवाल ने 'इंजीनियरिंग में नए वर्क में लिखित पुस्तक 'उत्कृष्टता' प्रकाशित करा

**डॉ.पी. के. बंधुवाल ने 'उत्कृष्टता' पुस्तक का प्रकाशन किया**

**Dr. Manoj Spokhne**

डॉ.पी. के. बंधुवाल ने 'उत्कृष्टता' पुस्तक का प्रकाशन किया

**Books in IP and clips of release and news clips**

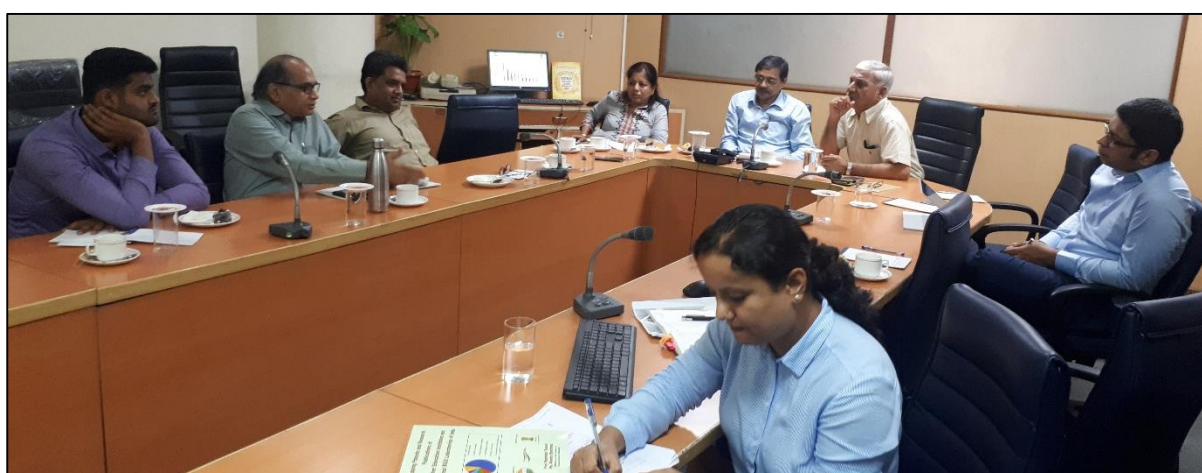
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Book release on the occasion of **Technology day at Vigyan Bhawan** in 2018



**Second Advisory Committee Meeting** on July 15, 2017 in Panjab University, Chandigarh



**Third Advisory Committee Meeting** on September 8, 2018 in TIFAC, New Delhi.



