



IP Ecosystem In Panjab University: A Case Study

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Abstract: Intellectual Property Rights is considered an important cog in assessing the innovation index of a nation. The global ranking organizations always have Intellectual Property or a subset of Intellectual Property as one of the parameters for understanding and grading the Science, Technology and Innovation (STI) ecosystem of a nation. The global ranking can be improved by sensitizing the teaching and scientific communities about the importance of IP and creating infrastructure for the same in the institutes of higher learning. Intellectual Property has a strong base in Panjab University. Various departments/centres offer courses (complete/partial) at undergraduate (UG) level, post-graduate (PG) level and Pre-PhD course. Department of Laws is offering full-fledged courses on IPR. In PU, other entities are also engaged in IP relate activities, such as ‘IPR-Chair’ engaged in promoting IP awareness, ‘DST- Centre for Policy Research’ (CPR) carries out patent-related research and ‘Centre for Industry Institute Partnership Programme’ ac nodal centre of Patent Information Centre (PIC) of Punjab State Council for Science and Technology and assists in patent filing. DST-Technology Enabling Center is involved with technology transfer and BioNEST provides incubation to the ideas that can be converted in to Intellectual Property in future and technology management of start-ups at Panjab University.

I. Introduction

Panjab University, founded in 1886, is one of the oldest universities in India. Since its inception, it has been recognized as a great centre of higher learning by various national and international organizations. It has produced iconic personalities in the fields of education, research, politics, sports, civil servants, historians, entrepreneurs and many more. Currently, PU has also made an impact at the national level in the domain of innovation. It was ranked 2nd in the ‘Atal Ranking of Institutions on Innovation Achievements’ (ARIIA) amongst Indian Universities as declared by Ministry of Education, Govt. of India in 2021 [1].

One of the critical parameters of innovation index is Intellectual Property (IP), and PU is doing quite well in it. The IP ecosystem of PU is far better than most of the universities in India. Various Departments/Centres offer courses (complete/partial) at under graduate (UG) level, post-graduate (PG) level and Pre-PhD course. Students/researchers are exposed to all major categories of IP i.e., Copyrights, Patents, Trademarks, Trade Secrets, Designs, Geographical Indicators, Traditional Knowledge, Semiconductor Integrated Layout Designs, Plant Varieties and Biodiversity. In addition, PU has many entities engaged in imparting IP knowledge to students and researchers; many patents have been filed by faculty members and some of them have been granted and licensed. In addition, PU is also engaged in research related to IP.

The IP ecosystem of PU can be divided into six verticals (Fig. 1), namely Centre for Industry Institute Partnership Programme (CIIPP), IPR Teaching, DPIIT- IPR Chair, DST- Centre for Policy Research (CPR), DST- Technology Enabling Centre (TEC) and Bio-incubators Nurturing Entrepreneurship for Scaling Technologies (BioNEST) [2].

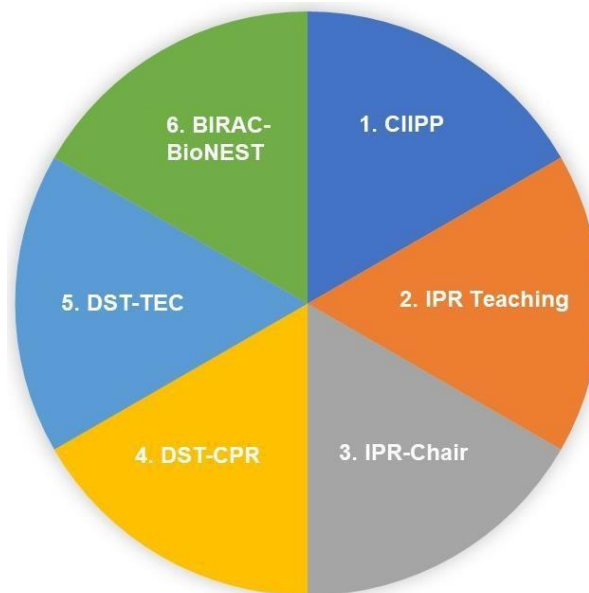


Figure 1: Verticals Engaged in IP Activities in Panjab University

II. Methodology

Intellectual Property Rights awareness is a necessity of the hour, and various countries and their universities/institutes are working hard to make people aware of IPR and also to have the best facilitation for IPR systems, as universities are the best place to make the young generations aware of the same as they are the nation's future. Keeping this in mind, the DPIIT-IPR Chair prepared this report, which will discuss all of Panjab University's IP-related verticals in order to provide inspiration not only to university students and faculty members, but also to other Indian universities working on their universities' IP ecosystems. To date, no such report has been produced in which each and every IP-related centre at Panjab University is included.

Thus, following objectives were taken under study:

1. To find out centres working directly or indirectly with IPR at Panjab University
2. Activities carried out by these centres with respect to IPR
3. To find out the number of patents filed and granted in the period of 2004-21 by Panjab University
4. To find out the number of patents filled and granted by individual faculty member from 2004-21
5. To know about the number of faculties of Panjab University are offering IPR courses
 - i. University Institutes offering IPR courses
 - ii. Departments offering IPR courses
 - iii. Centres offering IPR courses
6. To know about number of IPR courses are being taught at UG, PG and Pre-PhD levels
7. Recommendations for the enhancement of strengthening IPR Regime at Panjab University

The data for the study was collected and analysed by DPIIT-IPR Chair from each centre involved with IPR activities and from all the departments involved in IP teaching at Panjab University.

III. Results & Discussion

1. Centre for Industry Institute Partnership Programme (CIIPP)

CIIPP was set up by Panjab University in 1995 as a self-sustaining entity to bring industry closer to the academia and vice-versa, generate resources in the form industry supported projects and consultancy programmes, create environment for fostering close liaison with industry and organize need-based workshops/symposia in order to promote self-employment among the students [3].

- CIIPP is a Nodal branch of 'Patent Information Cell' of Punjab State Council for Science & Technology (PSCST) to stimulate patent awareness amongst teachers and students.
- It has a special budget for patent filing on behalf of Panjab University.
- It maintains a record of patents (filed, granted, licensed) owned by PU.
- It regularly organizes patent related seminars and talks.
- It assists in patent filling and also compiles the information regarding number of patent filed and granted with Indian Patent Office (IPO) by Panjab University.

The data of Patent Applications Filed/Granted by Inventors of Panjab University (2004-21) revealed that the Patent applications filed in this tenure was 81 (Figure 2) and number of Patents granted were 14 (Figure 3). While studying the department wise distribution of patent applications filed by Panjab University it was found that the top 5 Departments which have filed maximum number of patents are University Institute of Pharmaceutical Sciences (42) followed by Department of Microbial Biotechnology (12), Department of Microbiology (10), Department of Chemistry (5), by University Institute of Engineering and Technology (4), Department of Zoology (4), Department of Biochemistry (2), University Institute of Chemical Engineering and Technology (1), Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital (1) and Department of Biophysics (1) (Figure 4).

While studying in depth that which faculty member have filed highest number of patent applications it was found that the top 10 applicants were from the top 5 departments with maximum number of patent application filed. Out of these 10 faculty members, 5 were from University Institute of Pharmaceutical Sciences, 1 from microbial biotechnology, 3 from department of Microbiology and 1 from Department of Chemistry (Table 1).

Further, it was also evaluated that how many patent are granted or filed under collaboration with Higher Educational Institutes, Industries and National Funding agencies. The data revealed that in case of collaboration with Higher education Institutes there were only 2 collaborations i.e., Punjab Engineering College (PEC) and Kakatiya University, Telangana. In collaboration with PEC 2 patent applications have been filed and with Kakatiya University 1 patent application have been filed.

In case of Industries 4 collaborations were found i.e., Bio age Equipment's, Mohali, Venus Remedies, Panchkula, Span Biotech, China and M/S Unique Biotech Pvt. Ltd. Hyderabad. The number of patents filed with industries includes 2 in case of Bio age Equipment's, Mohali and Span Biotech, China while 1 patent application have been filed in case of Venus Remedies, Panchkula and M/S Unique Biotech Pvt. Ltd. Hyderabad.

Lastly in case of funding agencies three funding agencies were found with whom Panjab University have filed patents in collaboration. These funding agencies includes: Department of Biotechnology (DBT), Indian Council for Medical Research (ICMR) and Council of Scientific & Industrial Research (CSIR). In case of DBT 5 applications have been filed and 2 patents have been granted. While in case of ICMR and CSIR number of patent applications filed are 4 and 3, respectively.

After digging into all this data, it was also analysed that how many patents of all since 2004-2021 have been filed and granted in which field and it was found that maximum patents were filed (78) and granted (13) in case of Biological Sciences while in case of Engineering field the number of patents filed and granted were 3 and 1, respectively. Thus, indicating that there is a dire need to enhance patent filing from the engineering background in the University in future.

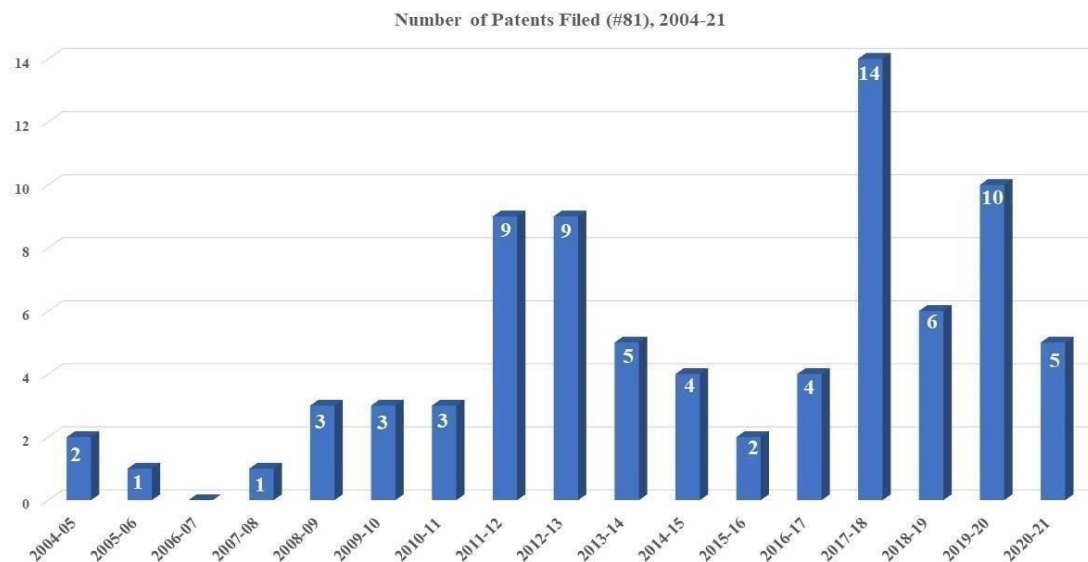


Figure 2. Year Wise Distribution of Patent Applications Filed by Panjab University (2004-21)

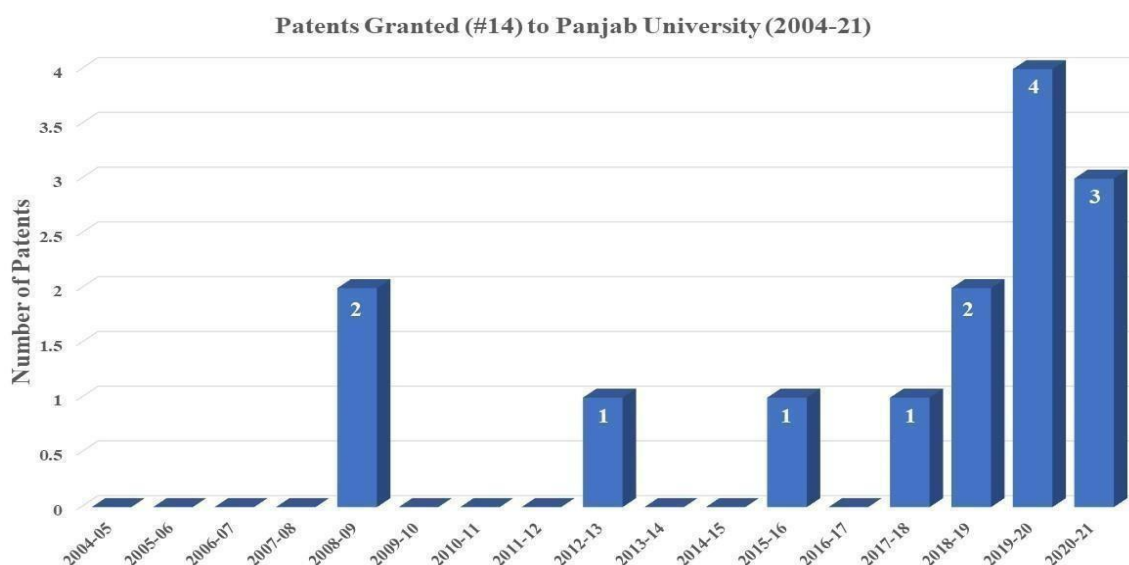


Figure 3. Year Wise Distribution of Patents Granted to Panjab University (2004-2021)

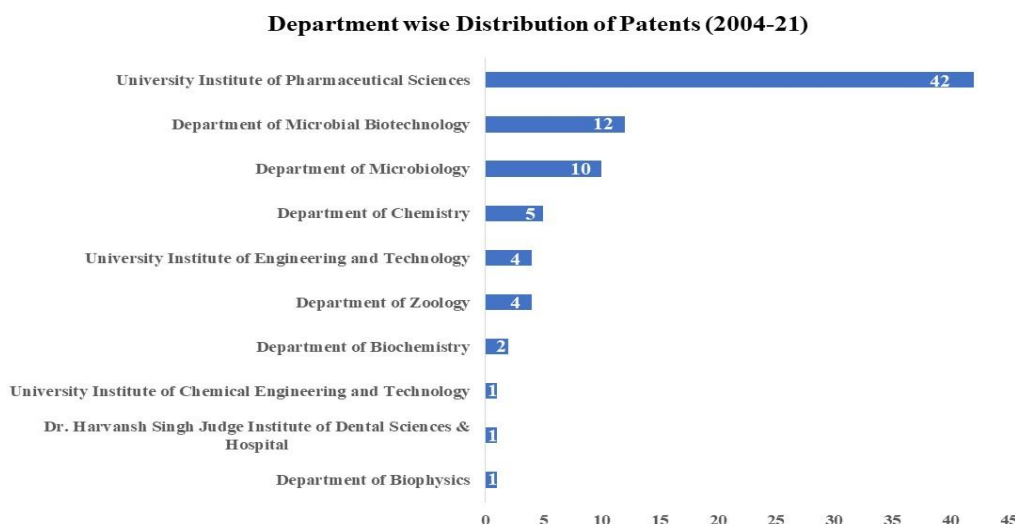


Figure 4. Department Wise Distribution of Patent Applications Filed by Panjab University

Table 1: Distribution of Patent Applications Filed by Individual Faculty Members of PU

S. No.	Inventor	Departments/Centres	Patent Applications filed	Patents Granted
1	Indu Pal Kaur	University Institute of Pharmaceutical Sciences	19	4
2	Rohit Sharma	Dept. of Microbial Biotechnology	12	1
3	Renu Chadha	University Institute of Pharmaceutical Sciences	8	-
4	Maninder Karan	University Institute of Pharmaceutical Sciences	5	-
5	O. P. Katare	University Institute of Pharmaceutical Sciences	5	2
6	Praveen Rishi	Dept. of Microbiology	5	-
7	V.R. Sinha	University Institute of Pharmaceutical Sciences	4	-
8	Gurpreet Kaur	Dept. of Chemistry	4	-
9	Naveen Gupta	Dept. of Microbiology	3	-
10	Prince Sharma	Dept. of Microbiology	3	-
11	Jagdeep Kaur	Dept. of Biotechnology	3	1
12	Karan Vasisht	University Institute of Pharmaceutical Sciences	3	-
13	Ganga Ram Chaudhary	Dept. of Chemistry	3	-
14	Sukhbir Kaur	Dept. of Zoology	3	-
15	R.K. Kohli	Dept. of Botany	2	2
16	Shishu	University Institute of Pharmaceutical Sciences	2	-
17	Sanjay Chhibber	Dept. of Microbiology	2	-

18	Vandita Kakkar	University Institute of Pharmaceutical Sciences	2	-
19	Upma Bagai	Dept. of Zoology	2	-
20	Bhupinder Singh	University Institute of Pharmaceutical Sciences	2	1
21	Satish Kumar Taneja	Dept. of Zoology	1	1
22	D.K. Dhawan	Dept. of Biophysics	1	1
23	Raghuram Rao Akkinpally	University Institute of Pharmaceutical Sciences	1	-
24	Manoj Kumar Sharma	University Institute of Engineering and Technology	1	1
25	Kusum Harjai	Dept. of Microbiology	1	-
26	Archana Bhatnagar	Dept. of Biochemistry	1	1
27	Sanjeev Puri	Dept. of Biotechnology, UIET	1	-
28	Sarvjit Singh	University Institute of Engineering and Technology	1	-
29	Oshin Garg	University Institute of Engineering and Technology	1	-
30	Saurabh Singh	University Institute of Engineering and Technology	1	-
31	S.K.Mehta	Dept. of Chemistry	1	-
32	Ashish Jain	Dr. Harvansh Singh Judge Institute of Dental Sciences & Hospital	1	-
33	Seema Kapoor	SSBUICET	1	-
34	Dipti Sareen	Dept. of Biochemistry	1	-
35	Rupinder Tewari	Dept. of Microbial Biotechnology	1	-
36	Gurpal Singh	University Institute of Pharmaceutical Sciences	1	-

37	Ashish Suttee	University Institute of Pharmaceutical Sciences	1	-
38	Mukesh Kumar	University Institute of Engineering and Technology	1	-

2. IP Teaching at Panjab University

Panjab Universities teaching and research programme comprises of 10 faculties (78 Departments and 15 Centres/Chairs). Out of 10 faculties, only 6 are offering IPR courses i.e., Faculty of Laws, Faculty of Engineering and Technology, Faculty of Arts, Faculty of Business Management and Commerce, Faculty of Science and Faculty of Pharmaceutical Sciences (Figure 5) [4].

2.1. University Institutes Offering IPR Courses at Panjab University

Five University Institutes are offering IP related courses:

- University Institute of Legal Studies (UILS)
- University Institute of Pharmaceutical Sciences (UIPS)
- University Institute of Engineering and Technology (UIET)
- University Institute of Chemical Engineering and Technology (UICET)
- University Institute of Applied Managements Sciences (UIAMS) [5-9]

2.2. Departments Offering IPR Courses at Panjab University

Nine Departments are offering IP related courses [4]:

- Dept. of Laws
- Dept. of Library and Information Sciences
- Dept. of Biotechnology
- Dept. of Microbiology
- Dept. of Microbial Biotechnology
- Dept. of Biophysics
- Dept. of Chemistry
- Dept. cum National Centre for Human Genome Studies and Research
- University Business School

3. Centres Offering IPR Courses @ PU

Three Centres are offering IP related courses:

- Panjab University Regional Centre at Ludhiana [10]
- Centre for Stem Cell Tissue Engineering & Biomedical Excellence [11]
- Centre for Human Rights & Duties [12]

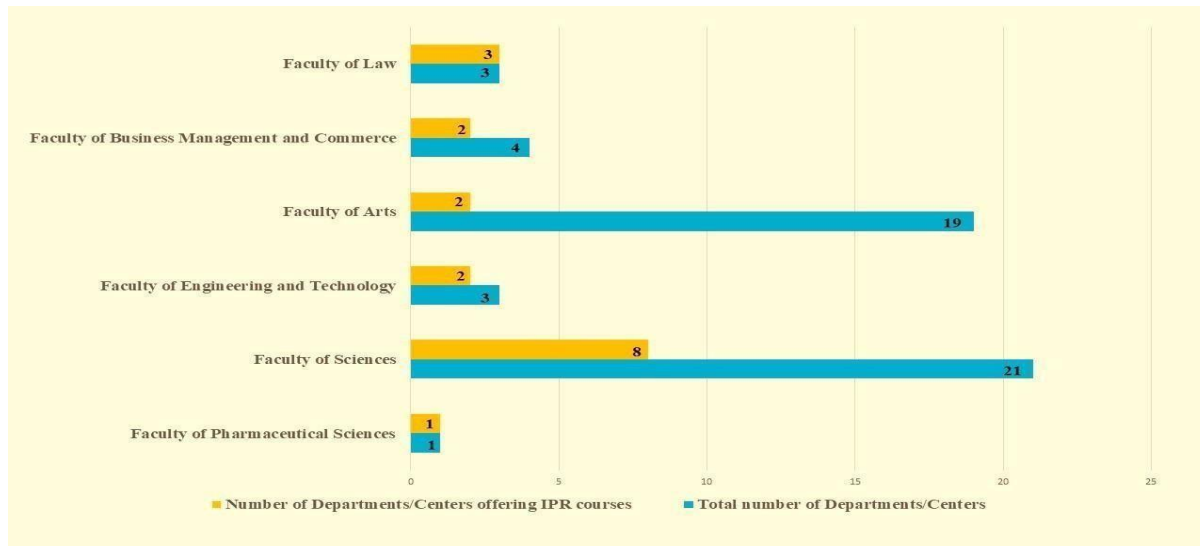


Figure 5. IPR Courses Offered by the Faculties of Panjab University

Total number of IP courses taught at Panjab University are 34. Out of these 34 courses the number of courses taught at undergraduate level are 13, at postgraduate level are 18 and at Pre-Ph.D. level are 3. Full time courses on IP are taught at Department of Laws and University Institute of Legal Studies only. In other departments it is taught as parttime course.

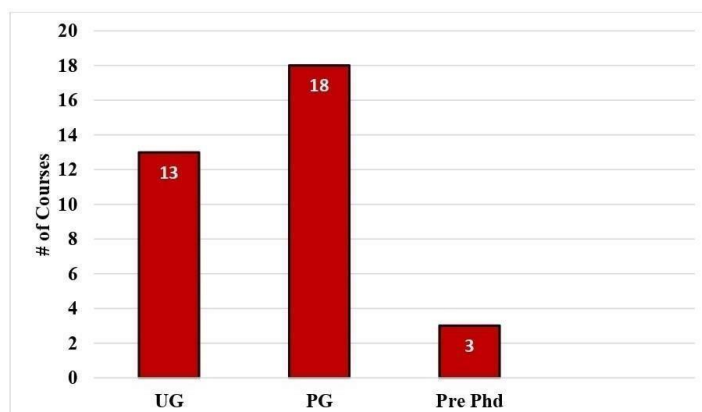


Figure 6. IPR Courses Being Taught at UG, PG and Doctoral Levels

3. DPIIT-IPR Chair

Developing nations, including India, are not IP savvy. There have been instances where IP ignorant persons had to face the music for using, though unknowingly, IP protected products. Thus, there is a dire need to spread IP awareness amongst the teachers, scientists, researchers and students of universities and colleges to avoid unnecessary litigations. Keeping this concern in mind, Department for Promotion of Industry and Internal Trade (DPIIT) of Ministry of Commerce and Industry, Govt. of India has introduced a scheme, 'Scheme for Pedagogy & Research in IPRs for Holistic Education & Academia' (SPRIHA) through which it has established Intellectual Property Right (IPR) Chairs in select universities of India. One such Chair is in Panjab University, Chandigarh, established in 2019.

DPIIT- IPR Chair has been active in organizing various webinars, seminars, workshops, conferences, faculty development programs related to IPR since 2019. Former IPR Chair Professor, Professor Rupinder Tewari along with Ms. Mamta Bhardwaj, Senior Scientist-C at DST-Centre for Policy Research has authored a book, 'Intellectual Property: a Primer for Academia', published by Publication Bureau of Panjab University, Chandigarh in 2021. DPIIT-IPR chair is also active in carrying out research on different areas of IP to contribute more in the IPR research pool.

DPIIT-IPR Chair have also prepared an introductory course on IPR for Departments/Centres of Panjab University and is in process to start it from session July, 2023 as per the consent sent by the departments of Panjab University. Apart from this DPIIT- IPR have also in process of starting a 6 months Certificate course in IPR under University School of Open Learning (USOL), Panjab University from session July, 2023. The minimum qualification of the course will be 10+2 (any stream) so that maximum people can attain the benefits of this course [13].

4. DST-Centre for Policy Research (DST-CPR)

The Government of India launched a program called SRISHTI (Science, Research and Innovation System for High Technology-led path for India) – as one of the main goals of the Science, Technology and Innovation (STI) Policy-2013 – which focuses on inclusive growth. As a part of SRISHTI, 5 Centre for Policy Research institutes were established by DST, in January 2014. DST-Centre for Policy Research is one of them. The mandate of the Centre is to 'Promote Public-Private Partnership in R&D', identifying the areas of policy gaps for stimulation of private sector investment in Research and development and suggest changes in the policy environment and adopt evidence-based approaches for identifying and promoting areas for generation of IP. The Centre has done commendable work in the field of Patents as evidenced by publication of a book, 'Patents and Publications of HEIs of India' in 2017; a report on 'Commercialization of Patents Granted to HEIs and NRLs of India' in 2020; and a chapter in a book, 'Industry-Academia Ecosystem in India' in 2016. Centre has also organized workshops and lectures related to IP and STI [14].

5. DST-Technology Enabling Centre (DST-TEC)

In order to provide a stimulus to innovations, DST, GoI set up TECs in select universities in 2017. The mandate of DST-TEC is manifold, such as mining of technologies being developed at various labs in Panjab University, map technologies requirement of MSMEs in and around Chandigarh, carry out the Market Study/ Assessment of the Technologies for their Market potential, networking with various technology development institutions and labs for refining of the technologies and periodic workshops/Seminars in collaboration with industries. DST-TEC is fully supported by DST and has allocated funds for hiring a patent expert [15].

6. BIRAC- BioNEST

To foster biotech/life sciences innovation ecosystem in the country, Biotechnology Industry Research Assistance Council (BIRAC) GoI established bio incubators, called as BioNEST, in universities. The vision and mission of BioNEST includes providing incubation space for start-ups and entrepreneurs, connect industry and academia and provide enabling services and required mentorship for IP and technology management [16].

IV. Recommendations for the enhancement of strengthening IPR Regime at Panjab University

From aforementioned data it can be speculated that Panjab University have virtuous IP ecosystem as compared to many other institutes all across the India. However, there are still many steps are to taken for further Strengthening the IPR ecosystem in Panjab University to have best IPR regime.

The suggestions for the same are as follows:

- i) It is imperative that each faculty member of PU should have basic knowledge about Copyrights.
- ii) Each faculty member of science-stream (of PU) should also have basic knowledge about Patents and Copyrights.
- iii) All research scholars (science stream) should also be exposed to basic knowledge of patenting.
- iv) Each faculty member who files for a patent, must make a serious effort for licensing of the patent. CIIPP should see to this, as patent filing fee and patent maintenance fee is provided by Panjab University, Chandigarh.
- v) All IITs have a strong alumni base. This alumni base is the ambassador for their institute. Each Science Dept. should prepare a list of alumni engaged with industries.
- vi) Licensing of Patents/technologies:
 - Robust Tech-Transfer agreement.
 - Look at Tech-Transfer policies of IITs & IISc Bangalore.
- vii) More emphasis on 'Technology-Pull' rather 'Technology-Push' approach.
- viii) Identify a few potential industries before developing a novel product.
- ix) Regular interactions with Industry Clusters (MSME)/Associations.
- x) Work on projects for which funds are available e.g., renewable energy, Biosensors and diagnostics, etc.

xi) Create Multi-disciplinary team.

V. Conclusion

It can be concluded that even though Panjab University have a strong IP regime still there is a gap in IP teaching as out of 10 faculties at Panjab University imparting education in different disciplines only 6 are providing IPR related courses either at UG/PG/Pre Ph.D. level. Also, in many of the cases IPR is a part of course or non-compulsory course in those faculties. Apart from this all the IPR related verticals are carrying out mostly individual research/events/other activities, in future all should collaborate so that maximum outcome can be obtained and maximum individuals come to know about IPR work at Panjab University. This will not only increase the awareness but also enhance the patent filling.

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgement

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