

Teaching Quality Intellectual Property Management using Information Technology in Indian Pedagogy

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Abstract— Creation, ownership and protection of Intellectual Property (IP) has become a complex system with the all pervasive technology changes in the field of Electronics, communication, Information Technology, Biotechnology, Nano-technology and Bio-informatics. Intellectual Property legislation has undergone a sea-change after its compliance with Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The IP Management is being introduced as a course curriculum through a number of full-fledged diploma and degree courses as a faculty of Legal Study in India. The course is of immense value even for the researchers, technologists, bureaucrats and other professionals for their survival in a knowledge economy. Due to lack of proper educational framework other than Law, they fail to appreciate the newly devised management techniques to be implemented by a number of legal, techno-legal or digital/electronic mechanism. This techno-legal approach in IP pedagogy is considered to show a new direction to cater a much wider section of users.

The paper aims to develop an open courseware based infrastructure to facilitate teaching learning process in IP. While developing the syllabus, lecture plan, practical assignment and case study for the paper 'Techno-legal Dimension of IP Rights', it has been observed that there are some conceptual gaps between the theoretical principles, a legislative framework and equivalent global aspects provided through a number of relevant web services. These problems and some of their solutions implemented successfully are discussed as a case-study in this paper. An innovative evaluation process and statistical feedback system is also developed. Being Chief Investigator of the project, 'Development of educational Content and Associated Depository of Web Services for Intellectual Property Rights', various IPR tools and databases are exploited in the curriculum on IPR of one semester duration. The curriculum designed is a combination of the following:

1. Survey course (IP as a faculty of law and its implication in WTO-WIPO regime) aiming to learning breadth and complexity of application of IP Laws and rules.
2. Specialized Course (Application sector wise in-depth study with economic implication) to give an overview of IP Law.
3. Advance Seminars
4. Practice courses:
 - Practical computer based assignment and training
 - Preparation of the case studies

The major objective of the curriculum is to achieve a sound base of IPR Strategy for engineers and researchers in science and technology with the four above stated pillars. The concept

learning through well-balanced courses becomes effective to accommodate the changes in IP management.

Keywords - Intellectual Property Management, Intellectual Property Curriculum Development, Techno-legal, Education, Learning, Web services in IP management

I. INTRODUCTION

The idea of protecting Intellectual Property (IP) and harnessing it for economic welfare of the creator is culturally quite alien to India. Creativity in any form is considered to be deployed for the general welfare of the society and usually not used for serving the creators' individual need. Thus the return from one's intellectual effort was not guarded as a matter of individual's right. The concept of modern Intellectual Property (IP) was introduced in British India in the wake of industrial revolution. The history of Indian legislation for the protection of Intellectual Property in India is not more than one hundred fifty years old. Intellectual Property legislation in India evolved in today's form due to its inclusion in Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement in the World Trade organization (WTO).

In this newly devised mechanism for Intellectual Property, IP education could not take off as a separate stream and no formal method of teaching and training was evolved. IP conscious educated mass of India moved to a greener IP regime in foreign lands causing brain drain. There are financial losses due to not filing of patents in time, not having proper legislative measure to protect geographical indication, not building a nationwide Traditional Knowledge Digital Library (TKDL), and not providing requisite support through IP policy framework. IP education has many implications relating to communication, operating systems, cryptographic technique [1].

The quality Intellectual Property Management teaching and the practical aspect of these principles are to be explained through a number of real life case-oriented experiences, which may have non-trivial, non-binary answers to context-based approaches. The objective of proposed course is to study the international IP framework by making them available in Indian legislative infrastructure for better IP management. The theoretical framework is prepared from a number of books [2, 3], papers from journals [5, 7, 8], and free course ware from World Intellectual Property Organization (WIPO) [6]. Fictitious cases are also prepared with model judgment with legal scrutiny having technical viability. A great deal of course design research has been

devoted to determining mechanisms for making web services (e.g., web services related to bio-technological patents and tools for checking the viability of patents).

The research presented in this paper addresses the following questions from a teachers' point of view:

1. Is there a way to teach legal IP management in a technical way to make the learning more effective?
2. Can concept learning be combined with technical training and practices?
3. Is there a way of dynamic evaluation of effectiveness in the course of teaching?
4. What are the best practices in teaching of IP management in Indian pedagogy?

II. INTELLECTUAL PROPERTY FRAMEWORK IN INDIA

A. Intellectual Property Legal Framework

Intellectual Property Rights can be thought of as a monopoly rights for a limited duration. Though the notion of intellectual property rights and doctrine of fair dealing in case of copyright had its root in Purana Samhita, one of the old scripture of India [11], no formal legislative infrastructure was available for protection. In the seventeenth century, the British Parliament passed the Statute of Monopolies for patents, to catch up technologically more advanced countries. The first Indian statute on patents was passed in 1856. When India became a member of World Trade Organization (WTO), India had some obligation under TRIPS Agreement; the Indian Patent act 1970 was amended by Patents (Amendment) Act 1999. Other than these acts, there are other acts like information technology Act 2000, Rights to Information Act 2002 (2005), Indian Penal code (IPC) which provides relief to problems related to Intellectual Property framework in India.

B. Education in Intellectual Property Management in India

The TRIPS Agreement recognizes seven kinds of IP, namely, Copyright and Related rights, Trademarks, Geographical Indications, Industrial Designs, Patents, Layout Designs (topographies) of Integrated Circuits, and Undisclosed Information (Trade Secrets). Ideally each person given education should be intellectual property aware so that he or she can think of the possible ways of gainful exploitation. The fact is emphasized in the objective of recently established Rajiv Gandhi School of Intellectual Property Law of Indian institute of Technology Kharagpur India [4].

III. INTELLECTUAL PROPERTY PEDAGOGICAL REQUIREMENT IN INDIA

A. Education in Intellectual Property Schemes in India

Government of India provides the necessary boost by deciding over various schemes for IP education, research and public outreach [9, 10]. It usually provides short term support like Scheme for Financial Assistance on Intellectual Property Right Studies, Organizing seminars and workshops

on copyright matters and Schemes for financial assistance on WTO studies. All the University grants Commission (UGC) recognized universities are eligible to apply for such grant. All-encompassing feature of IP makes IP education difficult to be appreciated at a lower level without a basic understanding of science / arts commerce and technology. IP education in general has a strong theoretical implication for legislation. Therefore the pedagogy of IP must preserve technological aspect of IP. This is usually done by teaching the basics of both legal framework as well as a core paper like 'Fundamentals of Computer Applications' or 'Fundamentals of Computer Science and Network Security'. W R Cornish's book [2] on Intellectual Property is an excellent introduction to the world of IP. It is preferred that the student should undergo a basic computer science course before formal introduction to IP related paper. Such assignment can be considered for its far-fetched technical implication [10, 12].

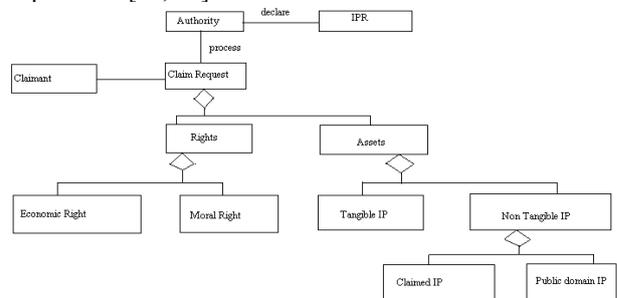


Fig.1. Assignment on presenting Elements of IPR Management System through UML Class Diagram

IP : Intellectual Property
IPR : Intellectual Property Right

This also demonstrates to the students that the theoretical concepts taught in the course can have different representation through UML class diagram and can even be considered for formal analysis in software engineering. This opens another set of research possibility to use UML for various IP related Web services. These web services can be considered on a Service Oriented Architecture (SOA) The students created a class diagram for the class IP in the Eclipse UML plug-in. Figure 2 shows a representation of IP as a class.

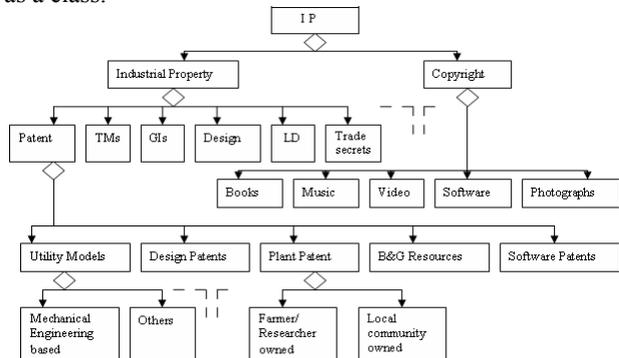


Fig. 2. Representing IP Classification through UML Class Diagram
IP : Intellectual Property
TMs : Trade Marks
GIs : Geographical Indications

LD : Layout Design for Integrated Circuit
 B&G : Biotechnology and Genetic Resources

B. Tools for Intellectual Property Management on Internet

The concept of IP was introduced within the purview of TRIPS Agreement. The students initially could not appreciate the idea-expression dichotomy of patents and copyrights. An assignment to detect various copyrightable and patentable products helped them to get clarity over the concept (Figure 3).

State following inventions qualify for patent in India? Give reasons as per Indian Patent Act (A), 2005 if not patentable.

1. A car traveling faster than the speed of light
2. A tune for a song
3. A new type of gambling machine with probability prediction
4. A mental calculation method of opponent move in playing Chess
5. A new procedure for brain surgery that does not need anesthesia.

Fig. 3. Sample Assignment on patentability and copyright

There was enough controversy regarding software copyright and patentable software. With software copyright, came different kind of licensing and question of fair use. An assignment on open source licensing, contract and copyright law [10, 13] helped them to determine when a software should be considered for copyright or patent or trade secret or even a technological know-how. The tools used in this course is The information utilized for practical applications were cross-checked for anomaly detection through www.wipo.int, [6] the official website for World Intellectual Property Organization. A small number of class participation tests were also designed to include them in formal evaluation.

TABLE IV. MARKS ON AUCTION AFTER EACH LECTURE (FORMALLY EVALUATED)

Class Participation Auction Mark 2 14.03.07
 Name: _____ Roll no: _____ Max marks: 1

What is the home page of USPTO? Tick out the correct answer.

1. <http://uspto.us>
2. <http://uspto.org>
3. <http://uspto.gov.us>
4. <http://patents.uspto.gov>
5. <http://patents.uspto.gov.us>

Indian IP Laws were introduced next. The Indian Traditional Knowledge Digital library was explored for possible reverse engineering. The students were given to understand the importance of preserving the traditional knowledge of a country and were ready to take up small projects. Even they were able to devise a method for capturing traditional cultural expression (TCE) by various means. A debate in the form of providing IP protection in dynamic media versus static media was arranged.

TABLE V. DEBATE ON IP PROTECTION ON DYNAMIC MEDIA

Govinda, an expert in fire-work preparation, can create different designs and patterns in air by sheer strokes of his hand and legs. He even used his gymnastic skills to create different patterns of burning fireworks and gives public performance on a commercial basis. Can he get an IP protection for his skill which he claims as his own? If yes, then what are the suitable forms of IP used for this purpose?

The other tool used is Aspect J of www.eclipse.org for the development of web services related to patent filing and arbitration. This tool is used for the project described above.

C. IP Curricular Development: A Techno-legal Approach

The legal implications of protection, defense, arbitration, negotiation, licensing etc. should be clear to all students and their technical counterpart like signing the Memorandum of Understanding (MOU) online, signing an electronic document digitally, encrypting a message, using secured web services [14, 15], checking for security and enabling certain protocols for such type of transactions. The value judgment was graded and rated as per legal interpretation of court represented by the students. IP

The curriculum was developed on the basis of the following course contents:

| Sl. No | Name of the Institute |
|--------|---|
| 1. | Rajiv Gandhi School of Intellectual Property Law (IIT Kharagpur) West Bengal India - Bachelor of Law with specialization in Intellectual Property Rights Diploma Program in Intellectual Property Law - Three semester, part time, non residential |
| 2. | Institute of Intellectual Property Research and Practice, Uttar Pradesh India - Established in 1995 |
| 3. | IIT Allahabad India - Master of Science in Cyber Law and Information Security - Four semester, full time, residential, introduced in 2004 |
| 4. | MNNIT Allahabad India - Master of Technology in Information Security - Four semester, full time, residential, introduced in 2007 |
| 5. | IGNOU New Delhi India - Post Graduate Diploma in intellectual Property Rights - Two semester, Distance education mode, introduced in 2005 |
| 6. | NIPO World Wide Academy - Prime on Intellectual Property General course on Intellectual Property – Copyrights and Related Rights Electronic Commerce and Intellectual Property biotechnology |

Such effort has already been made in case of Computer Science [7] as a project – a joint undertaking of the Computer Society of the Institute of Electrical and Electronics Engineer (IEEECS) and the Association of Computing Machinery (ACM) to develop Curricula Guidelines for undergraduate program in computing. Similarly in case of IP education, the developed curricula should include: The IP body of knowledge, The curricula for undergraduate program, a set of learning objectives to be developed, to assess the student achievement, Curriculum model considered based on practice, Course description of each course to be reviewed by teachers and practitioners as well.

A balance between the knowledge and the pedagogy is required to be achieved at the end of such curricula development. The focus of the proposed approach was to consider Internet as a unifying theme of various services including web services.

While preparing the lesson plans, assignments and exercises for the semester course in IP and International treaties, following were the major guidelines:

- ✓ IPR is a very open field with a possibility extension beyond a particular area namely, legal stream or technology.
- ✓ IPR has its foundation from legal studies, but encompasses applicability in a wide variety of disciplines
- ✓ The present interest and possibility of vast commercial exploitation of IPR requires a dynamic review of the corresponding curriculum.
- ✓ Clear identification of required skills and knowledge should be emphasized.
- ✓ All the above should be imparted to the student with forty five core contact hours (plus minus 10 percent) of

class room teaching in one semester and ninety hours of laboratory sessions including the take home tests and assignments

- ✓ The teaching of the said paper must go beyond national boundaries.
- ✓ Formal mathematical reasoning is integrated to application and judgment required in the field of IPR
- ✓ In today's society of knowledge economy, there are very many applications of computing. The students should be exposed to the computing applications in the field of IPR
- ✓ There is scope for students in this course to work with local companies to create internship in which students have the opportunity to engage in projects in industry. There fore a project component can be a epilogue for such a course
- ✓ The ten percent students (3 out of 31) develop a strong research connection to a faculty member who served as a mentor, even after finishing the course.
- ✓ The students (10%) can establish a track record of project experience in term of short term research objective. This record has helped them to create and manage their own IP.
- ✓ Incorporation of professional practice in to the curriculum is another facet.

IV. STYLING ASSIGNMENT, TAKE HOME TESTS, EXERCISES, CLASS PARTICIPATION ACTIVITY AND PROJECTS

A. Categories of Assignments and Exercises

The exercises and assignments are divided into following broad categories:

1. Short objective type question related to periphery of the topic required to be solved by students at the end of each class room session as class participation activity.
2. Short answer type based on the core concept and problem associated with theory is given at the end of each topic as a class test.
3. 24 hours take Home Test is given to the students which require professional practice orientation. Effort should be there to find a solution or fix the problem by using electronic services available or by suggesting tackling the problem by digital means.
4. Presentation on the topic of recent issues, current practices and research updates is required to be prepared by each student. This helps the students to catch up with the recent trades
5. There is traditional question-answer problem-solution type mid-semester and end-semester examination.

B. Assignments and Exercises

The course was introduced to students with the general view of intellectual property, which require protection in the given sense of TRIPS Agreement. There was enough deliberations on idea-expression dichotomy and recent controversy regarding software as a copyrighable or patentable.

The short answer type class test after completion of each topic is conducted to judge the preparedness of students and their interest to tackle a problem in which they have already received enough theoretical input. Law The adaptation of students according to the updated input is evaluated.

TABLE VII. ASSIGNMENT RELATED TO PARIS CONVENTION / PCT

Mr. A files a patent application on 20-03-2002 for a patent for invention P1 with the date of filing as 20-03-2002 in a member country C1. Mr. A files a patent application on 20-05-2002 for a patent for invention P1 with the date of filing as 25-03-2002 on the same patent for invention P1 in a nonmember country C2 where he is domiciled. Mr. A files a patent application on 31-03-2002 for a utility model P1 in a nonmember country C3 where he is having a marketing, sales and distribution office. Mr. B files a patent application on 30-03-2002 for a patent for invention P1 with the date of filing as 30-03-2002 in a member country C4 and C5. Mr. A files a patent application on 21-03-2003 for a patent for invention P1 in a member country C5. Indicate the status of the patent or utility model for Mr. A and Mr. B in each country C1, C2, C3, C4 and C5. Justify your opinion in the context of Paris Convention.

The take home test is likely to give the students much more freedom to work and to show their originality and innovation,

The end-semester question paper included a case study to judge the clarity of concepts they have learnt. There was enough scope for students with average capability to obtain a good grade by sheer practicing upon the concepts learnt and also there was scope for exceptionally brilliant students to showcase their talent.

V. A CONCEPT DEVELOPMENT APPROACH THROUGH AN EXERCISE AND POSSIBLE SOLUTION

A. Case Study

This section gives details of a case study based on the judgment of concepts:

Case Study
I am a fan of Indian Cricket Team. Whenever there is a homeland test or ODI or friendly match, I prefer to wear a unique hair cut and hair style to encourage the team spirit. The micro step-cut on the left side of my scalp clearly indicates the flag of India without the 'Chakra'. The three clearly visible bands are colored with a proportionate hair-color mix of reddish brown with orange tinge, white and shine green. The micro step-cut on the right side of the scalp shows the outline map of India. The hair-color mix I love to put on this part of the scalp indicating my beloved country, depend on the season in India. I have a local fan club and any member, who wants to sport my hair style; I offer him or her hair-cut and coloring free of cost.

1. I consider my unique hair-cut cum hair-style as my intellectual property and want to get protection under suitable form. Kindly suggest me the suitable IP protection measure so that I can protect it for a longer period.
2. If my friend, Aditya, sports the same hair-cut and uses it as a brand for the caps he produces, then is he likely to pay me a part of his profits? He claims this brand as his IP. Is this form of IP is different from my form of IP? Can he be charged for copying my hair-style as brand?
3. Is it a case of infringement of my IP, if my friend Aditya offers training to fan club members in this hair cut free of cost during season?
4. Is it permissible for Aditya to open a Unisex Beauty Parlour which offers this hair-cut and style as one of its services? What are the situations when he can be charged of infringement of IP?
5. I have a life-style shop, where Manoj is a contractual employee bound by Confidentiality Agreement. Manoj has been trained by me for the method of preparing hair-color mix (including a perfect mix of color to indicate our National flag). Can he add up a method to add a 'chakra' in the hair-cut and put a claim for this IP as his own?
6. What will happen if Manoj discloses his new design of hair-cut to put chakra in the National flag in the hair-cut, to others without my permission?
7. I was photographed by media (news paper, news channel) as a unique fan and the photograph was displayed next day in all major Indian and Australian dailies. Can I charge the media for infringement of my IP?
8. One person from Australia, Ritcha, gets an idea from the photograph and puts up similar hair-style and cut where the national flag and country are replaced by

- her native equivalent. Is there a way to stop him from getting the idea?
9. Being a teacher of IPR, Shailesh wants to use the same case-study as given here to teach his students, knowing fully well that the case-study is a copyrighted material taken from a paper, 'Teaching Quality IP Management in Indian Academy' in IJOL by the author. What is the possible ground of defense taken by Shailesh, if charged with infringement?
10. The case-study happens to be one of the chapters from a book written by me. I have entered into a contractual agreement with a reputed publisher for publishing the book for India, Bangladesh and Sri Lanka. Do I need to take permission from publisher before giving an oral presentation in a lecture demonstration for which I will be paid an honorarium? What will be the possible ground of my defense to publish the case-study through an end-semester question paper to a group of students of CLIS in Deemed University without publisher's permission?
- All answers are required to be justified according to the legislations in India.

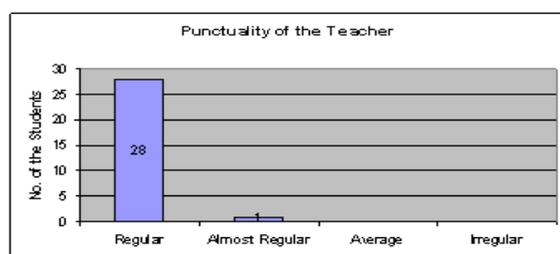
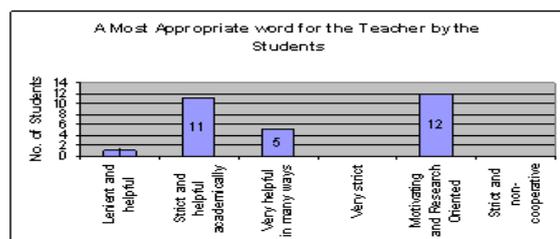
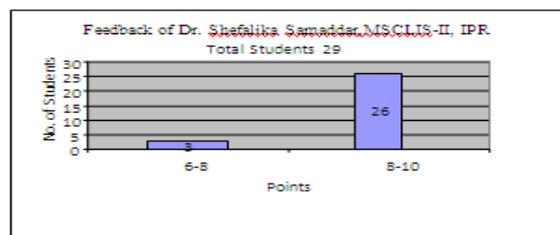
The evaluation of the answers of this case study divulges some interesting outcome:

- The IP form of choice suggested by most of the students (17 out of 31) was copyright. Majority (12 out of 17) of them suggested a way for copyright registration as an IP protection. They had enough reason to believe that A few of them (2 out of 12) suggested to obtain a copyright protection in a cost-effective manner. A sizable number of students (6 out of 31) suggested a way to get a design patent and subsequent commercial exploitation.
- A few students (2 out of 31) suggested that it can be maintained as a trade secret, but could not provide viable way. 2 students suggested that the design method can be patented as a process patent and had given their own reasoning which was not very valid.
- 3 students argued that this is not an acceptable IP form as it fails to satisfy the conditions of copyright-ability being in a dynamic media and of patentability as the method is obvious. The other forms did not satisfy the candidature.
- One student argued that this is an IP but IP protection cannot be provided by any means as the media on which the expression is captured is a dynamic media (hair is growing continuously), therefore, this expression can not be captured for copyright, even by photograph, as it represented as original expression of one instant only. Again, it would be very difficult to prove infringement of hair design style, media being dynamic. Any kind of infringement in this regard can have the defense of private use, user's right of public performance on a non-commercial basis etc. However, if there is an automated process to generate the same hair style as design with electronic precision, then the equipment becomes patentable and design becomes copyright-able.

The student is given full marks in spite of his different approach from majority of the students as he was able to think on the concept beyond the present time frame.

B. Student Feedback

The feedback of the course was analyzed statistically and found to be highly satisfactory.



VI. A CONCEPT DEVELOPMENT APPROACH THROUGH AN EXERCISE AND POSSIBLE SOLUTION

The course is a combination of theoretical material with implementation through usage of Internet and computers. It emphasizes a techno-legal framework and deviates from the traditional approach taken for IP education in India.

The students found the Take Home test interesting and learnt to use digital libraries extensively. The course prepared the students to receive some tool centric input as well. There was zeal among the students to go for these extra miles in order to score over others. Though this approach promotes healthy competition, it has the drawback to drain upon the participation of the other courses in the same semester where such approach was not followed. It can be concluded that changing approach to a single course may not be beneficial for the overall growth of the student; rather it should be applied uniformly over all the courses of the programme.

The students in course of their learning attended few seminars to know the state-of-the-art towards the end of the course. They would interact in an impressive manner with internationally known peers in this field. The evaluation technique to get a feedback on evaluated answer scripts, gives a feeling of transparency. Students were able to compare themselves with each other and able to discover their strong points. There was a trend towards capability learning among average students.

Teaching this course by the proposed method is very time consuming. Out-of-the-classroom interaction was essential for total development of this teaching-learning method. The

exercise plan requires be authoring in every semester and requiring to be updated on the latest research outcomes. However teaching this course is considered as rewarding as the students with lowest grade proclaim that evaluation has been objective and learning has been subjective but precise.

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