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# Model IPRinternalise™ – Integrating Intellectual Property Rights in technical education

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**Abstract**

The present model "IPRinternalise™" seamlessly integrates Intellectual Property Rights (IPR) in technical education, primarily in India, by incorporating the IPR process in all student projects from a very early stage so that the students get exposed to the significance of prior art searches, analysis of prior art in the context of the problem they are solving, developing solutions that are novel, have tailored inventive steps and are useful. Such an approach value adds to the "learning" ability of the students and instills in them ethical values and trains them to observe, critically analyse and provide innovative solutions thereby making their educational process substantially comprehensive. The model "IPRinternalise™" also provides a sustainable, cost effective and scalable process for the creation of a critical mass of networked IP literate personnel who are trained to work in "Communities of IP Practices".
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## 1. Introduction

Education is a process for the development of evergreen minds with the ability to perceive the future, learn continually from the exhaustive global knowledge bank and innovate to meet evolving needs of society. The eastern system of education has always propagated "a learning based" educational process as opposed to "teaching based" approach as is practiced in various countries. The present work explores an approach to seamlessly integrate the IPR process in a formal technical educational system, structured in a manner to make IPR a way of enhancing their skills and learning abilities without subjecting them to IPR courses in addition to their technical courses.

Several authors have discussed varying approaches to introducing IP in technical education. Hennessey [1] proposed models such as the case method, problem solving method, simulation model, clinical method and doctrinal method. Kaplan and Kaplan [2] and Soetendrop, McLaughlan, Roach, and Childs [3] have proposed and designed IP courses for non-lawyers as a formal part of their technical education and implemented them through interdepartmental collaborative efforts.

## 2. Model IPRinternalise™

The present model "IPRinternalise" in contrast to earlier efforts, seamlessly integrates IPR in technical education in a well-structured IPR process providing an experience-lead framework with value added learning. The "learn as you do" system induces a student to naturally explore and exploit the richness of existing knowledge (prior art), contextually build on it and provide technical solutions to problems as he assesses it, and in the process inculcates the necessary IPR skills to create and protect his creations. This approach to IP for a student is "stress and burden free" but "relevant and need based" as he is drawn into it by a natural tide originating from his immediate requirements as is depicted in Fig. 1.

The system is designed to catalyse the initial creation of an intra-institutional core group of IP literate professionals

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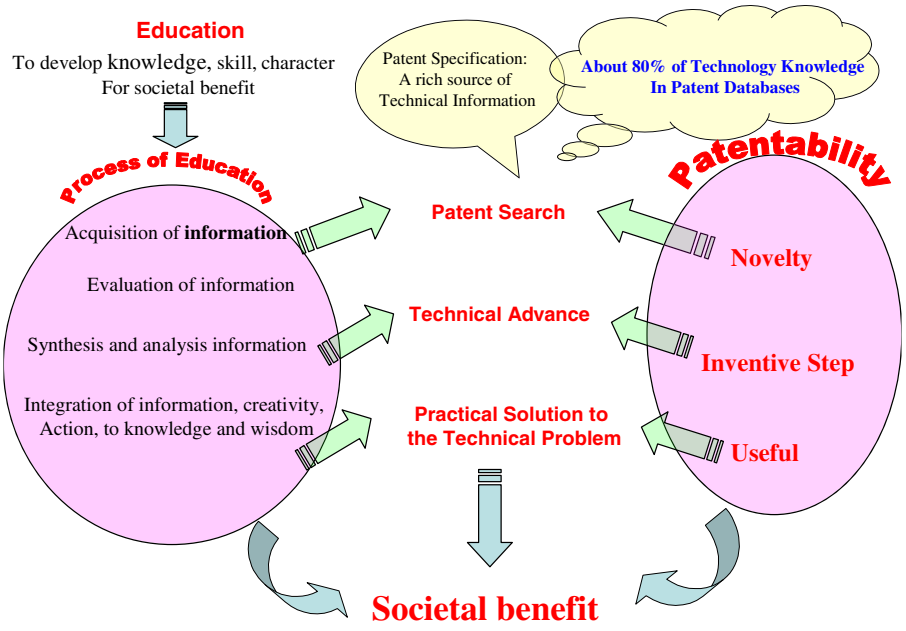



Fig. 1. Model "IPRinternalise™".

drawn from faculty and technical staff who voluntarily opt to go through the process. The faculty and staff attend an IPR awareness programme specifically designed to demonstrate how IPR helps to enhance the quality of technical education and how exposure to IPR helps to develop creative minds. The formation of an "IPR literate core group" in the institution ensures a buy-in at the grassroots level thereby laying the foundations for a multiplier effect in which an institution's "core group" as trainers, are able to train "core groups" in other institutions. Such a peer-to-peer transfer of purpose and experience encourages inter-institutional group learning among the trainers and trainees, thereby ensuring continual skill growth within institutional networks, which establish a critical mass of IP trained personnel in a region. This process assumes initial support from the management of the institution in which Institutional IPR Policy is set up holistically addressing all aspects of IPR including ownership of inventions, rules for transfer of technology, benefit sharing, etc. as illustrated in Fig. 2.

The core group as illustrated in Fig. 3 is exposed to the basics of IPR in structured training programmes, taught how to identify problems, how to conduct prior art searches, how to design inventions to solve the identified technical problems, how to design inventive steps in an invention, how to read patents and interpret claims, etc. The IP literate core group then guides students on how to approach their projects, which the students are expected to formally complete as part requirement of their Bachelor's or Master's Engineering Degree Programmes.

The students, for example, at the third year of their engineering degree course are drawn into brain storming sessions to sensitise them to their environments to critically observe and select problems that appeal to them and then

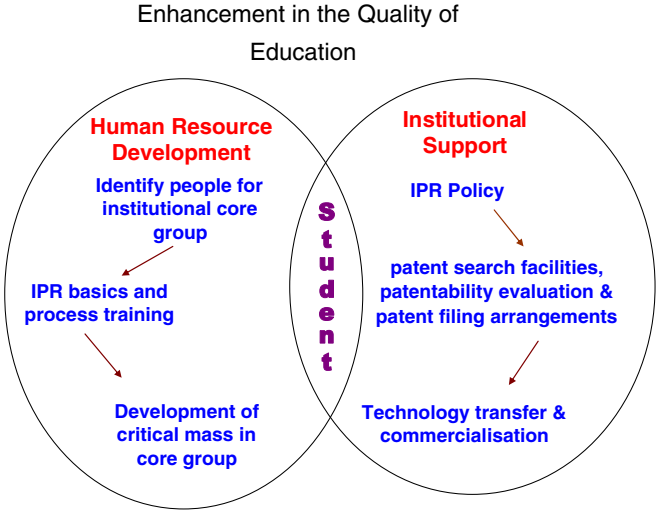



Fig. 2. Model "IPRinternalise™" enhancing quality of technical education.

are initiated to the IPR process by the trained "IP literate Core Group" to the global literature including patents search. The students then seek inventive solutions to the identified problems keeping in mind the relevant prior art. As the project progresses, the IP core group evaluates the results for appropriate protection by way of patents and design registrations (Figs. 3 and 4).

The institutional IP Core Group with support of their respective institutional management also serves to identify possible partners for commercialisation of the inventions, which are outcome of the student projects. These provide practical opportunities to the IP core group to further their learning and skills in the process of technology transfer and commercialization of their acquired IP.

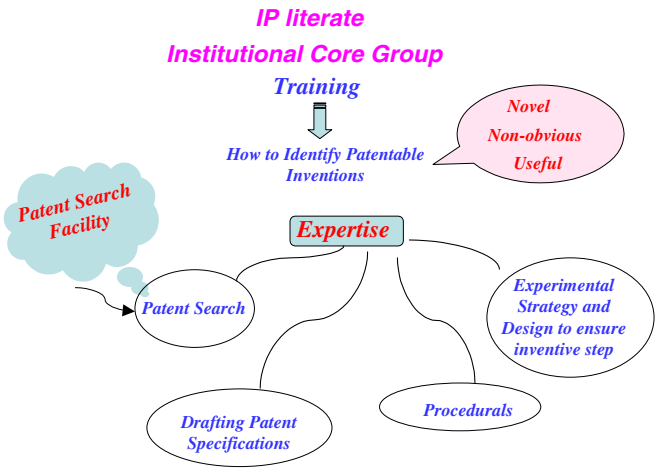



Fig. 3. "IPRinternalise™" intra-institutional core group.

It must be appreciated that the IPR process as practiced in the Model "IPRinternalise™" helps to enhance quality of technical education. The system naturally induces students and faculty to critically view their work from three integrated perspectives viz. novelty, inventive step and utility. It leads them to analyse their work not only based on novelty which is typical among academicians, but also on the inventive step which is probably not obvious to a person skilled in the art thereby helping them to develop their ability to conceptualise a problem, identify facts and design technical solutions through their inventions. Further the process helps the students and faculty to imbibe the significance of prior art, appropriate quoting, citing and giving credits to previous workers in their reports, and refraining from any form of plagiarism. Such a process helps to raise the ethical standards in a learning society.

At various stages of the students' projects, an IPR professional is drawn into the programme to formally evaluate patentability of the inventions, train the IP core group to draft patents on identified inventions and have them filed in the Indian Patent Office. Other professionals are consulted on the marketability of the inventions and such a process is presently being perused with a few of the inventions for which provisional patent applications have been filed.

Achieving a critical mass of IP trained personnel has eluded previous efforts due to lack of continuity, inappropriate selection of the people to be trained, infrastructure, funds, and more importantly skepticism by academics with regard to IP, etc. Most capacity building programmes or "train the trainers" programmes have failed, as appropriate people who would carry on the process in the long-term are generally not identified to participate in such training programmes. Such a shortcoming is recognized in model "IPRinternalise". One of the best options is to follow a "policy top-down" and "working bottoms-up" approach in which the senior management of institutions is exposed to the concept and benefits of the "IPRinternalisation" process. Such peer group to peer group transfers of belief and practice assists in the confidence building within the management of institutions to get initiated into the "IPRinternalisation" process. The enlightened senior management as believers of this process identifies appropriate personnel from their respective institution to form their core groups for training and implementation of the "IPRinternalisation" process in their institutions. An intra-IP Institutional IP Core Group once trained is ready

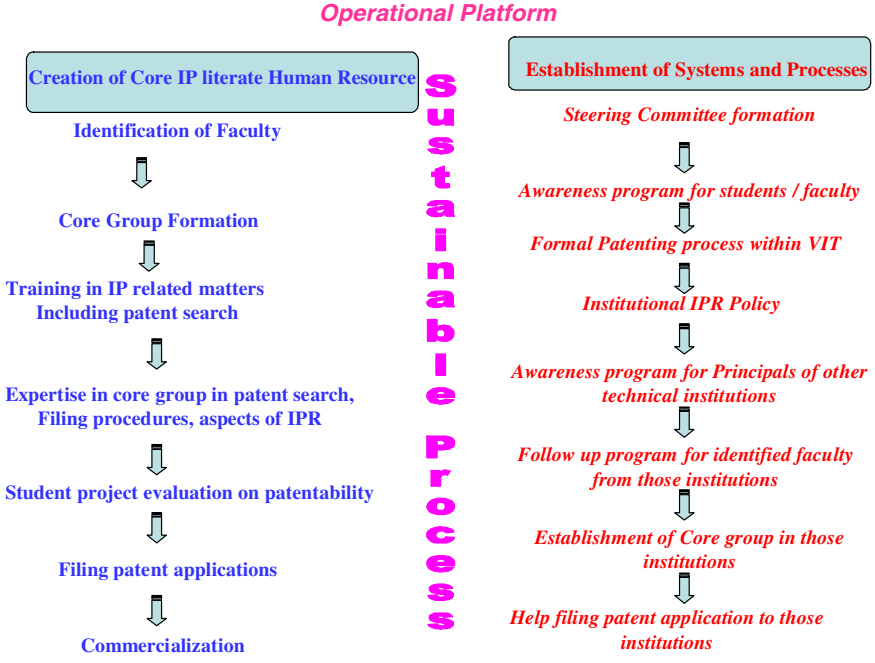



Fig. 4. Operational platform of "IPRinternalise™".

to take on additional responsibility to create and train IP Core Groups drawn from other institutions.

The interoperable and networked ''Communities of Practice of IP literate Core Groups'' is an easily scalable working model. It addresses most of the previously experienced shortcomings of IP capacity building programmes and demonstrates an elegant and cost effective process to achieve critical mass of IP networked institutions and simultaneously induces students to make IP a natural relevant process in their technical education and in their future professional lives.

## 3. "IPRinternalisation" process at the Vishwakarma Institute of Technology, Pune

Vishwakarma Institute of Technology Pune, India (VIT Pune), is a leading center for technical education offering courses in Bachelor's and Master's Degree in Engineering with student strength of 2700, faculty strength of 213 and technical staff of 42.

VIT Pune embarked on it ''IPRinternalisation'' path in April 2005 with a familiarisation programme for the Senior Management, faculty and technical staff, conducted by Professor Ganguli. This was followed by the formation of the IP Core Group through voluntary participation of the faculty and technical staff of the institute.

The IP Core group was subjected to intense IPR sessions by Professor Jabade on the basics of IPR, techniques and websites for prior art search, how to read and analyse patents, how to identify problems, suggest solutions that may have an inventive step, design experiments keeping the requirements of novelty, inventive step and usefulness as key requirements for patentable inventions, etc. The IP Core group then teamed up with a set of students in their projects, which is a part requirement of the degree programmes. They facilitated the students to identify problems especially based on their native environments, conduct prior art searches, help the students to design experiments, etc., and at an appropriate stage evaluate the project for patentability and even file patents. During the period April 2005–April 2006, VIT Pune also developed its institutional IPR policy, which was ready for testing with the set of inventions that were already identified from the third year engineering degree students' projects. Some of the projects that were found to be patentable and for which patents have been filed are Novel Milk Extracting Device for Milking of Animals, Production of Paraboloidal Surfaces (manufacture of lenses for telescopes), Voice-Interacting-fare indication device for Taxis, Tuk-Tuks, and Telemedicine System on Ambulances for applications in rural areas. Of these projects and the patents filed, the patent filed on Novel Milk Extracting Device for Milking of Animals is vigorously being followed up for commercialization. VIT is supporting the student to incubate a business based on his invention and the project has now moved beyond the ''proof of concept'' stage to the product development stage. A second generation product has been developed and demonstrated to the stakeholders who are presently negotiating possible commercialization of the novel milking machine.

In April 2006, Professor Abhyankar invited principals, deans and senior managements of 17 colleges in the State of Maharashtra covered under the Technical Education Quality Improvement Programme (TEQIP) – a programme of the Government of India, to share VIT Pune's working experience, with ''IPRinternalise™''. Subsequent to the above familiarisation programme, five of the participating institutions formed their IP Core Groups.

In October 2006, VIT Pune's IP Core Group conducted training programmes on ''IPRinternalise™'' in which the members of the five newly formed IP Core Groups participated expanding the community of IP Core Group Practices to four members. By the end of 2008, the network would integrate about 10 institutions in the State of Maharashtra. In January 2007, this experience has been shared by VIT Pune with several Technical Educational Institutions in the State of Karnataka in a workshop that was held in Bangalore under the auspices of the State Education Department, Government of Karnataka and also in May 2007 at a conference on IP Education organized by Professor Soetendorp in London.

## 4. Learning from VIT Pune's experience with "IPRinternalise™"

One of the significant learnings from this experiment in terms of human resource development is providing a platform for the participants to naturally inculcate in them a systematic process of enquiry and targeted technical solution designing, recognizing the richness in mapping of prior art and how patent information in combination with the other literature can be strategically used to avoid rediscovering the wheel and possible infringement of others' intellectual property rights. ''IPRinternalisation'' facilitates and promotes lateral thinking, mind de-conditioning, development of creativity, enhances expression clarity and above all sensitises the participants to their environment. The quality of students' project reports also gets enhanced with relevant and critically analysed citations, and documentations. Further for the IP Core Group the process provides a channel for purpose driven team working with continual upgrading of individual and group skills that is central for sustained growth of any institution.

For the participating institutions, IPRinternalisation draws the senior management in cohesive planning through the creation of comprehensive Institutional IPR Policy with its transparent implementation plans. Complex issues such as technology development and transfer, networking with other academic institutions and industry get attended appropriately as outlined in the institutional IPR Policy.

It is important to recognize that IPRinternalisation emphasizes on the process of learning by doing and sparking the creative instincts dormant in individuals or in

teams. It assumes that any patents or design registrations that might emanate from IPRinternalisation are only a bonus over the primary objective of seeding and creating purposeful querying minds.

The process is cost effective and scalable and generates an operative platform for institutions to work in networked communities of practices.

For policy makers, governments and funding agencies, "IPRinternalise™" is a value added process with high returns meeting all the basic needs and goals of education.

Above all "IPRinternalise™" paves the way to building a responsible ethical creative society.

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In addition to numerous publications in technical fields and IPR, he is the author of three books. His forthcoming book titled "Geographical Indications. . . . .its evolving contours" is in press. He is presently co-editing a volume titled "Technology Transfer issues in Biotechnology" with Dr. Ben Prickril (France) and Dr. Rita Khanna (USA), which is due for publication by Wiley–VCH (Germany).