Integrating **intellectual property rights** in technical education

For most staff and students in higher education institutions around the world, their knowledge of intellectual property rights (IPR) is something that occurs incidentally, and post-project completion. In India however, new trends are emerging as efforts are being made to incorporate IPR thinking from the start of academic projects. **Siddharth Jabade**, **Hemant Abhyankar** and **Prabuddha Ganguli** discuss.

The approach

IPR provides a legal framework that facilitates innovation by granting limited protection to the innovator against illegitimate copying and unauthorised use, in return for the innovator disclosing his creation to the society. The IPR system in effect provides a platform for equitable sharing of knowledge so that others have access to the protected knowledge for further legitimate development, with a proviso that any exploitation of IPR is done with the consent of the IPR holder, with reasonable benefits and returns to him.

IPRinternalise, the present model, seamlessly integrates IPR in technical education in a well-structured IPR process providing an experience-led '*gurukul*-like' framework with value added learning.[1] The problem-based 'learn as you do' system naturally induces a knowledge seeker to 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 problem-based approach to IP for a knowledge seeker 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 **Figure 1**.

The system is designed to catalyse the initial creation of an intra-institutional core group of IP-literate professionals drawn from faculty and technical staff who voluntarily opt to go through the process. This ensures continuity of the programme and assists in initiating a multiplier effect in which an institution's 'core group' train 'core groups' in other institutions. Such a peer-to-peer transfer of purpose and experience encourages inter-institutional group learning among the trainers thereby ensuring continual skill growth within institutional networks, which establishes 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 **Figure 2.**

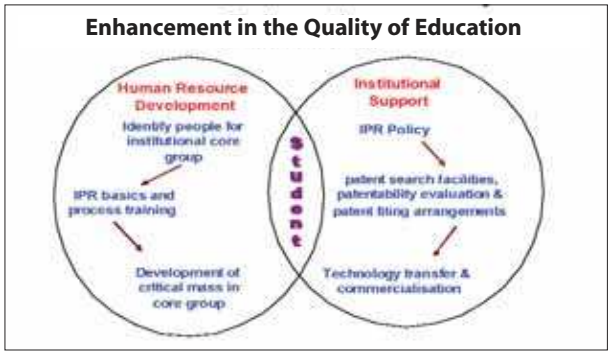

Figure 2: IPRinternalise model: Enhancing Quality of Technical Education

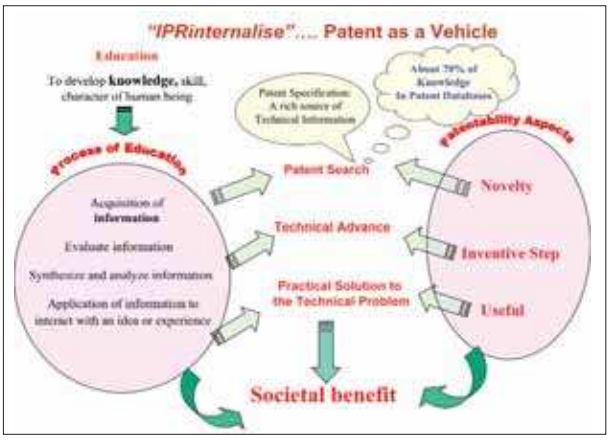

Figure 1: IPRinternalise model

The core group as illustrated in **Figure 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 complete formally as part requirement of their Bachelor's or Master's Engineering Degree Programmes.

The students are drawn into brainstorming sessions to sensitise them to their environments, to enable them to critically observe and select problems that appeal to them. They are then initiated to the IPR process by the trained IP-literate core group through 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 (**Figures 3-4**).

The IP core group with support of their respective institutional management also serves to identify possible partners for commercialisation of the inventions, which are outcomes 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 commercialisation of their acquired IP.

IPRinternalise naturally induces students and faculty to view their work critically 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 academics, 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

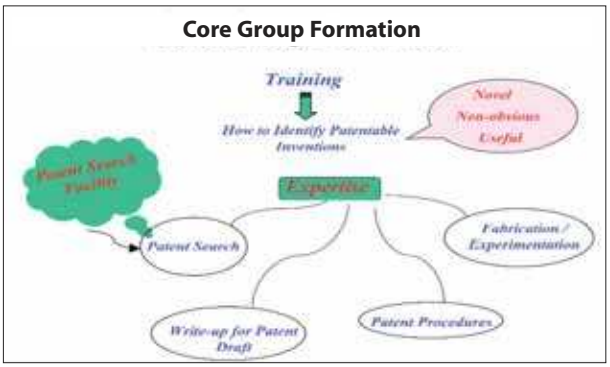

Figure 3: IPRinternalise Intra-institutional Core Group

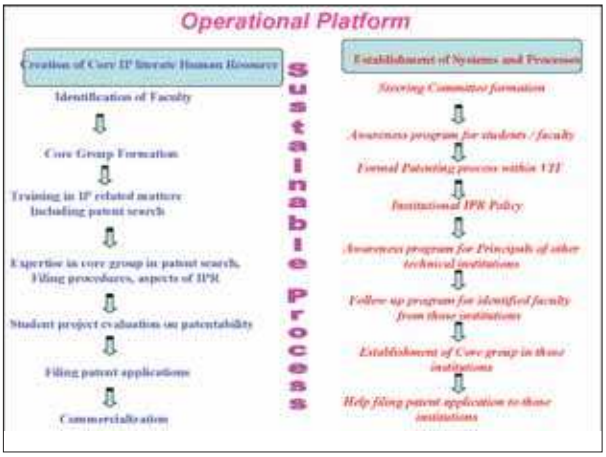

Figure 4: Operational Platform of IPRinternalise

solutions through their inventions.

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, 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 recognised in IPRinternalise. One of the best options is to follow a 'policy top-down' and 'working bottom-up' approach in which the senior management of institutions are exposed to the concept and benefits of the IPRinternalisation process. Such peer group-to-peer group transfer of belief and practice assists in confidence building within the management of institutions. The enlightened senior management, as believers in this process, identify appropriate personnel from their respective institutions to form their core groups for training and implementation of the IPRinternalisation process in their institution. An intra-institutional IP core group once trained is ready 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.

IPRinternalisation process at the Vishwakarma Institute of Technology, Pune

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

VIT Pune embarked on the IPRinternalisation path in April 2005 with a familiarisation programme for the senior management, faculty and technical staff, conducted by Professor Prabuddha 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 Siddharth 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 and to conduct prior art searches. They helped 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 students' projects. These are presented as case studies in Table 1.

In April 2006, Professor Hemant Abhyankar invited principals, deans and senior management 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, three of the participating institutions formed their own IP core groups.

In October 2006, VIT Pune's IP core group conducted training programmes on IPRinternalise in which the members of the three newly formed IP core groups participated, thereby expanding the community of IP core group practices to four members. By end of 2008, the network will integrate approximately ten

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Table 1: Student Projects in the IPRinternalise Process at VIT Pune

Name of Inventor	Title of Invention	Patent application No.	Summary
Amol Kadam	Novel Milk Extracting Device	1613/Mum/2006	The present invention provides manually operable, simple and cost effective milk extracting device from animals obviating the use of pressure pulse generating means integrated in the vacuum line and electrical intervention, just appropriate for rural application.
Abhilasha Katariya, Manasi Honrao, Prof. Phakatkar	Production of Paraboloidal Surfaces	1445/Mum/2005	The present invention relates to a device and method for producing paraboloidal surface. The judicious selection of resin formulation and the process of the present invention results in substantially reduced time of the said surface generation without maintaining hardener rich atmosphere over the surface.
Prafulla Kesari, Rohit Kadam, Sumeet Chordiya	Voice-Interacting-fare indication device	616/Mum/2006	The present invention relates to an electronic meter/device, when fitted to a hired transportation vehicle, is capable of calibrating, displaying in regional language, and voice play backing the fare, of the distance travelled by such transporting vehicle. There is inherent cross checking of the fare displayed and read.
Sanket Dodia, Rahul Bhat, Prof. (Mrs.) Mhetre	Telemedicine System on Vehicle	615/Mum/2006	The present invention relates to a novel telemedicine communication system in ambulatory vehicle with a capability of transmitting medical data using available local wireless network to the nearest hospital for substantially reducing time delay in medical attention in rural sector.

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.

Learning from VIT Pune's experience with IPRinternalise

One of the significant takeaways from this experiment in terms of human resource development is providing a natural platform for the participants to naturally inculcate in them a systematic process of enquiry. Participants also learn how patent information in combination with other literature can be strategically used to avoid rediscovering the wheel and possible infringement of others' intellectual property rights. The quality of students' project reports also is enhanced with relevant and critically analysed citations, and documentations. 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 recognise that IPRinternalisation emphasises the process of learning. 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. RG

[1] Education as traditionally practiced in India, within its *gurukul* system through a process of 'doing' coupled with contemplation, was based on a process of cumulative experiencing leading to seeding of creative enriched minds, until the 'syllabus based' Western influence set in.

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