Role of IP policy in innovation and entrepreneurship development : Case study of HEI in India

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Abstract

Over the years, with the development of science and technology world has seen shifts in economy from farming to industry to knowledge. Today we are in technology driven, knowledge based era of which foundation is intellectual involvement. Intellectual property (IP) regimes are envisaged to protect this intellectual involvement. Today almost all dimensions of human life are touched by intellectual property rights (IPRs). Higher Educational Institutes (HEIs) are becoming aware about IPRs and their role in creating sustainable development of the nation. Institutional IP policy is one of the policies which plays major role in R & D management to enhance innovation and entrepreneurship. World has seen examples how HEIs through IP development had created giant organizations such as Google, Genentech Inc. This clearly indicates that effective IP policy of HEIs plays crucial role in IP development by creating encouraging environment for R & D development to fulfill national and global needs of the society.

The objective of the study is to perform case study of one of the HEIs in India and find out how Indian HEIs are getting ready to play their role in enhancing the entrepreneurship in the country through IP creation. Here we studied the IP policy and IPM system of the HEI. We then compared the output of IPMS that is IP generated before and after the IP policy was institutionalized. We observed that though the development and implementation of IP policy at HEIs is a challenging and slothful process, still once stakeholders get acquainted with the policy guidelines they appreciate the importance of its implication. We also observed that a well documented visionary IP Policy results in increasing the IP generation output and creation of start-ups based on this IPs.

Keywords: *Innovation & entrepreneurship, Intellectual property policy, Intellectual property management, IPM system, Higher Educational Institutes*

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1. INTRODUCTION

HEIs are the powerhouses of intellectual capital (IC). IC is divided into three subtypes: human capital, relational capital, and structural capital (Sullivan, 2000). Along with these three capitals that is human, relational and structural capital; cognitive capital, conative capital, and affective capital are the part of the IC. Conative capital refers to the aspect of mental processes or behavior directed towards action or change. Cognitive capital refers to the mental process of knowing and includes aspects such as awareness, perception, reasoning, and judgment. Affective capital refers to feelings and emotions about the innovation project, motivated by desires, values, and beliefs. These six forms of intellectual capital together make up the innovation capital of an organization. Innovation capital is responsible for innovations and inventions. Management of innovation and inventions is necessary to generate a wealth from this newly created knowledge. One of the approaches to generate wealth from innovation is entrepreneurial approach.

In changing scenario of economy, there is a challenge to entrepreneurs to sustain in global competition. This is because the current economy is knowledge based. Liberalization and new economy put pressure on inventors and entrepreneurs in the form of fear of copying or imitation of innovation and invention. One of the way through which this scenario is handled by entrepreneurs is by protecting their knowledge. Thus the protection of newly created knowledge is becoming one of the mandatory processes to survive in global competition. This protection is achieved through IP laws to produce Intellectual property (IP). Thus new knowledge which is created through innovation is protected and managed through IP Management system (IPMS).

Management of IP is very critical process. It demands special expertise. IP needs attention through three perspectives as law, management and technology. Thus integration of all three domains is necessary to handle IPM. To manage IP, efficient IPMS is required. Efficiency of IPMS is determined how efficiently the IPMS system handles IP generation, protection, and commercialization. This all levels of IPM practices will be effective if organization have written guidelines for management of IP. One of the best ways to have these guidelines is to have IP policy which will help all stakeholders to understand the practices to be followed to handle innovation and IP. IP policy development and implementation is one of the important attributes in IPMS. Well documented IP policy provides guidelines for efficient management of IP which is generated through innovation. These IP policy guidelines may help to integrate innovation and IP. This integration is probably one of the ways to spur entrepreneurship and further leads to wealth creation through this entrepreneurship. This is because IP provides advantage in cutting edge competition as it protects the invention from copying by competitors or any other entity.

Thus there is a relationship between IPM and innovation process and entrepreneurship. Understanding the relationship between these processes that is IPM and innovation management process and entrepreneurship will trigger the establishment of an efficient and encouraging environment at HEI for start ups, industry-academia partnership and overall open innovation for the benefit of the society.

2. LITERATURE REVIEW

This section is divided into four parts: The first part provides a brief review of literature pertaining to IP. Second part covers literature on innovation, IPMS and economy of the nation. Third part covers literature on IP policy. Fourth part highlights the research gap.

2.1. Intellectual property

In the knowledge dominated economy, IP occupies a significant position. The field of IPR has evolved considerably over the last 20 years. The importance of traditional tangible assets such as land, labor, capital etc. is reducing and intangible assets (IA) such as knowledge, information, creativity and inventiveness are receiving more attention. IP has made its way in accounting books of an organization. On the accounting front, two new accounting standards, FASB (Federal Accounting Standards Board) 141 and 142, were recently introduced in the USA. These new standards require all companies with USA GAAP (Generally Accepted Accounting Principles) requirements to identify and value their IP and to include those valuations on their balance sheets to provide investors with greater certainty regarding the value of those corporations.

Gallini notes recent increase of patenting in new fields like biotechnology, software and business methods, and increased number of patents in these areas. In comparison with the 1980s, new patent applications in the USA to domestic inventors more than doubled by the late 1990s. Biotechnology and software patent grants doubled between 1990 and 2000. The largest 100 universities tripled their annual patent output from 1984 to 1994. The real expenditures on research and development by small and medium-sized firms (fewer than 5,000 employees) more than doubled between

1987 and 1997. Global acceptance and utilization of IP tools confirm that in future there will be more innovation and economic growth of Nations. An efficiently operating IPM system at organizational level and country level is critical to spur innovation and bring new services and products to the marketplace faster (Obama, 2011).

Sullivan has suggested classification of IC of firm as human assets and IA (Sullivan, 2000). According to this, IPR are the subset of IA. According to Litschka et al (2006), IA are classified as human, organizational and codified assets. Human capital is knowledge that the human resources would take with them if they leave the organization. Organizational capital (OC) is knowledge that stays within the organization at the end of the working day. Codified assets are those assets which are protected by some law. In law, IP refers to a legal entitlement, which sometimes attaches to the expressed form of an idea, or to some other intangible subject matter. IPRs are one of the IA. Almost all IPs can be enforced through the law. IP is the commercial application of innovation and creativity for improving and enriching lives at both the practical and cultural levels.

Authors had meticulously analyzed available literature on IA, IC, and IPR. This study helped to understand the position of IPR in complex organizational capital. IP are part of financial capital (FC) and intellectual capital(IC) but there position in organizational capital (OC) changes due to dynamics of IPM (Gargate & Jain, 2013). IPR are a key consideration when an organization is planning its entry-mode decision into the international market. The estimated value of IP assets can be in billions of dollars and they need to be protected. For example, the *Tropicana* trademark, a type of IPR, is valued at more than U.S. $1 billion, and *Marlboro's* trademark is worth up to U.S. $40 billion (Shippey, 2002).

IP has been defined in various ways. According to World Intellectual Property Organization (WIPO), IP is the creation of mind such as inventions, literary and artistic works, and symbols, names, images, and designs used in commerce. In law, IP refers to a legal entitlement, which sometimes attaches to the expressed form of an idea, or to some other intangible subject matter. IA when protected by law become IPR and confers right to the owner.

2.2. Integrative nature of innovation and intellectual property, and economy of the Nation

Developing and protecting IA are extremely important for Nation. Countries like Venezuela and Saudi Arabia are rich in natural resources but have made poor investments in their people and systems. As a result of this they produce far less output per person than countries such as Singapore and Taiwan which have invested heavily in human and information capital and effective internal systems. IP is one of the factors which may drive economy of the Nation. Scientists have to see their work in the context of the economy of their nation, because universities and state-subsidized research institutes with their research and development activities are the spur for new products and processes. The investment in knowledge needs to be made accessible to the business world, in keeping with the following definition: research means transforming money into knowledge; and innovation means transforming knowledge into money.

There are few landmark cases considering the IPM at country level. Turmeric and basmati case are well known in India. TKDL project objective and initiation, is the one of the examples, of country level response to IP related scenario at global level. Like India, few other countries like Thailand and Taiwan faced issues related to IP. Government of Thailand faced problem and lost its valuables without any return may be due to lack of appreciation of biodiversity and IPM. The prominent cases are of Plownoi, BIOTECH and NECTEC case, Jasmine rice case. BIOTEC (a division in the National Science and Technology Development Agency, NSTDA) and the National Center for Genetic Engineering and Biotechnology (NECTEC) are government depositories in Thailand. They transferred some 200 fungal strains which were isolated around

the Songkhla area – to an institution in the UK without Material Transfer Agreement (MTA), which made Thailand government to lose their valuables literally without any returns (Cheeptham, 2001).

Intellectual property management (IPM) is a multifaceted discipline and involves five key responsibilities as IP generation, portfolio management, IP valuation, competitive assessment and strategic decision. IPM is a challenge faced mainly by IP managers and technology managers. IPM basically deals with the policy formulation followed by designing the strategies for acquiring, protecting and exploiting the technology developed. Many organisations have realized the need to integrate IP with business strategy. The IPM process is shown in Figure 1.1.

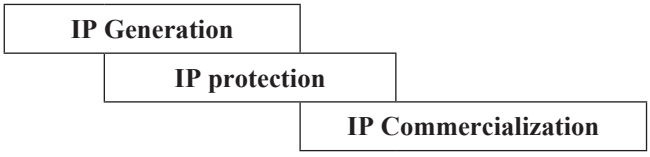

Figure 1.1: IPM process

The innovation process comprises the follow ing steps: ideation, selection of ideas for development, pilot plant, scale-up, and the product or process to be practiced at a large scale. Innovation management process is categorized into three stages broadly and can be represented as shown in figure 1.2. These three processes are overlapping; that is, before end of the one step, the next step starts.

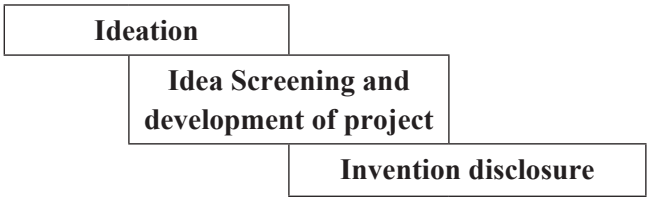

Figure 1.2: Innovation process

IPR are the outcome of the innovation process. Not all innovations can be converted into IPR. Only those innovations that qualify for the criteria of IP laws generate IPR. IP commercialisation produces tangible assets, and tangible assets produce FC.

Mapping of the innovation process with the IPM process shows that the three steps of innovation process and the three steps of IPM process are parallel. The first step of innovation process is 'ideation' and the first step of IPM is the IP generation stage. The second step of innovation process is the idea screening and development of project – that is, the IP protection stage of IPM. The third stage of innovation process is the 'invention disclosure' – that is, the IP commercialization stage of the IPM process.

2.3. IP policy

IPM can be seen at two different levels as internal management of IP and external management of IP. Internal management of IP is about running of the IP department and managing its interaction with other departments. External management of IP is primarily focused on how an organization interacts with other organizations' IP and vice versa. IP policy provides the guidelines in these interactions and IPM. Sanchez et al (2006) suggested ICU framework for the management, measurement and disclosure of IC within universities and research centers. World Intellectual Property Organization (WIPO) had given extensive "IP Audit tool for country" which covers various aspects of intellectual assets of the country as plans, policies, human capital development, Small and medium scale (SME) industries and IPM system, incentive and innovation promotions, market identification and strategy, IP laws and regulations, IP administration, public awareness, professional education in IP, university research and development programmes, cultural assets, tourism, traditional knowledge and so on in very detail. Thus IP audit can be at country level, industry level and organizational level.

2.3.1 IP policy and US universities

The US federal system was not clear on ownership issues in 1960s which created problems related to licensing and technology transfer. Stevenson-Wydler Act (SWA) and the Federal Technology Transfer Act (FTTA) in the USA provided with the setting up individual and distinct institutional patent agreement. These two Acts set the base for patenting as an output

from research laboratories. Later in 1980, the Bayh Dole Act (BDA) was passed by the United States of America (USA) Congress and became effective from 1981. This Act allows universities to patent and exclusively license government funded inventions by transferring the rights of IP generated under government grants from the funding agencies to the Universities. Before the establishment of BDA, not many universities found it worthwhile to get into the patenting business since this was connected with high fixed cost. There has indeed been an increase in patenting and licensing activity on the part of US universities after the establishment of BDA. The Association of University Technology Managers (AUTM) survey identified that inventions disclosure increased by 84%, new patent applications by 238%, license agreements by 61%, and royalties by more than 520% (AUTM Licensing Survey, FY 1991 and FY 2001).

2.3.2 IP policy and India

The ke y stakeholders of HEIs are professors, scientists and students. In most of the Indian universities/ research laboratories with some exceptions, these stakeholders are not aware about IP. Most of the HEIs and research laboratories in India conduct research activity against educational funding. CSIR, IITs are prominent players active in research.

Indian Patents Act and IP policy related indicators:

A. Indian Patents Act, 1970, Sec. 146(2) reads as follows: Power of Controller to call for information from patentees.—

(1) The Controller may, at any time during the continuance of the patent, by notice in writing, require a patentee or a licensee, exclusive or otherwise, to furnish to him within two months from the date of such notice or within such further time as the Controller may allow, such information or such periodical statements as to the extent to which the patented invention has been commercially worked in India as may be specified in the notice.

(2) Without prejudice to the provisions of sub-section (1), every patentee and every licensee (whether exclusive or otherwise) shall furnish in such manner and form and at such intervals (not being less than six months) as may be prescribed statements as to the extent to which the patented invention has been worked on a commercial scale in India.

B. Indian Patent Act, 1970, Rule 131 reads as follows:

Form and manner in which statements required under section 146(2) to be furnished.—

(1) The statements which shall be furnished by every patentee and every licensee under sub-section (2) of section 146 in form 27 which shall be duly verified by the patentee or the licensee or his authorized agent.

(2) The statements referred to in sub-rule (1) shall be furnished in respect of every calendar year within three months of the end of each year.

(3) The Controller may publish the information received by him under sub section (1) or sub-section (2) of section 146.

Thus Indian patents Act clearly depicts and expects the commercialization of IP generated which is achieved generally through either licensing or entrepreneurship development.

2.3.3 The evolving environment of IP system

Before justifying the effect of IP policy, we need to identify the relevant stakeholders for such act to serve its purpose. A historical study on how the context was setup for IP system is interesting to look once. Industrialization led us to the IP system coming to forefront. The active participation of the private industry in the USA to support and manufacture during war times laid the foundation for a very close and active collaboration between the research centers and private industry. With such an integrated platform, opportunity and need to commercialize the scientific

developments always get a boost. In such a setup, a uniform policy is of utmost relevance for the relevant members concerned to be benefited.

2.4. Research Gap

It is very clear from literature survey that government, researchers and practitioners are realizing the critical role of IP to manage research output of HEIs. Innovation and inventions are created and are protected by IP laws to generate strong IP portfolio which in turn can help in development of entrepreneurship to produce wealth. Considering the enormous importance of IPRs and ICs, in this competitive world, directive guidelines for innovation and IPM is the need. These directive guidelines can be agreed by well documented IP policy for smooth implementation of the processes, codes and conducts to be followed by each stakeholder of the HEIs. In this paper authors have shared their learning from the case study of one of the HEIs in India.

3. RESEARCH METHODOLOGY

The research methodology employed for this study is a combination of literature survey, case study and expert opinion. Literature survey was done keeping in mind the relevance of the topic under study. Case related primary data is collected through interview of R & D, IP personnel and top administrative authorities. Secondary data is collected from records kept at HEI, research articles and annual reports. Case analysis and synthesis has been developed based on valuable inputs, insights shared by key personnel and data received.

3.1 Research scope

Research scope is limited to HEIs. Authors have focused classification of IA as shown in figure 1.3. Authors have focused on IPR classification according to law. IA are classified into two categories: IC and IP. IC is further classified into human capital, OC and relational capital. IP is classified further as patent, copyright, trademark, industrial design, layout design of integrated circuit, geographical indication, trade secrets, and protection of plant varieties and farmer's rights. For each IP, separate Acts are enacted in various countries, under TRIPS guidelines. For example, in India, patents are protected under the Patents Act of 1970; copyright is protected by the Copyright Act of 1957; and so on. Though trade secret is an IP, there is no specialized statutory law for its protection and hence the word 'secret' in its nomenclature is important to note. Though there is no specific statutory provision to protect trade secret, the common law provisions may be employed to get very little degree of protection, and that confidentiality is the crux of the 'trade secret'.

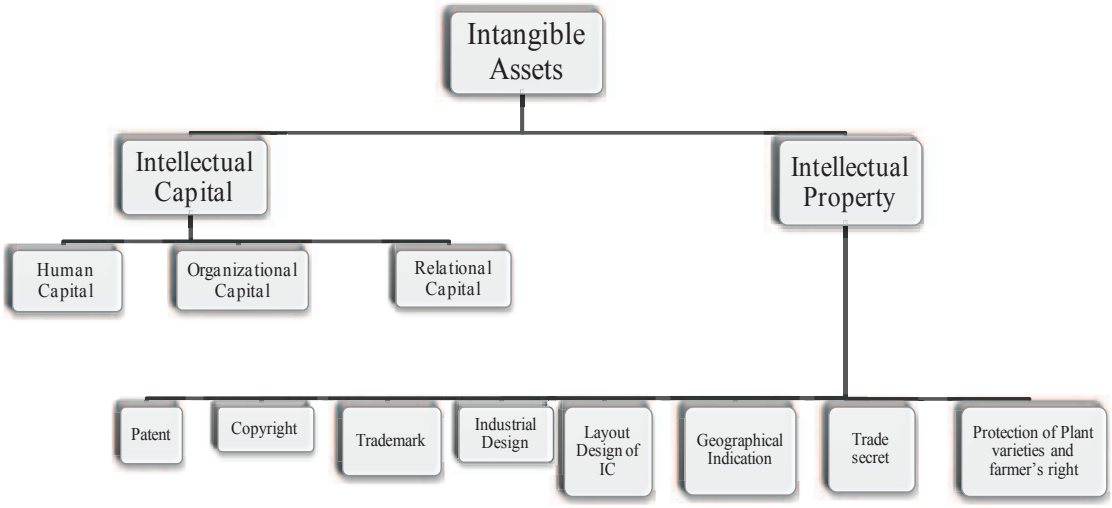

Figure 1.3: Classification of IA

4. CASE DISCUSSION

For case study one of the HEIs from Institutes of National Importance (INI) is considered. The HEI under study is established in the year 1958. INI is a status that is conferred to a HEI in India by an Act of parliament. INI is an institution which serves as a pivotal player in developing highly skilled personnel within the specified region of the country/state. The reason for selecting this particular institute is that the HEI under consideration is having enough IP awareness with IPM strategy. The HEIs appreciate the importance of IP policy. The IP policy of the HEI is developed and implemented in the year 2003 and then revised in the year 2012 as response to dynamics of IP system. IP policy of the HEI is thorough and addresses issues regarding ownership, inventor-ship, authorship, material transfers, various agreements, technology transfer, commercialization, and profit sharing and so on. The institute owns almost all types of IP.

4.1 HEI IP policy objectives

The objective of IP policy is to provide guidelines on various issues related to IP development and its commercialization. The IP policy has its motivations to leverage the science & technological developments that takes place in the HEI systems. The crux of the IP policy lies with the owner able to license or sell the IP generated through the technology transfer offices setup. By providing this fundamental empowerment, IP policy directs the alignment of the research activity with the market needs, makes the HEI financially self sufficient and push for entrepreneurship. IP policy can address issues as at two levels – to design incentive systems and to help expand IP awareness within HEI. IP policy need to have inbuilt components for assessing, measuring and continuing support for the science and technology development related activities. Minimum four possibilities considering IP policy of institute/s will be….

a. HEI has not authentic approved written IP policy document
b. HEI has authentic approved written IP policy document
c. HEI has partly or fully implemented IP policy.
d. IP policy is fully ingrained in the HEI.

4.2 HEI IP policy development

IP policy development for public HEI is a very critical and challenging task. It is expected that IP policy be able to bridge the innovation process and entrepreneurship development. For the HEI's IP policy development, the separate committees were formed which will address on issues related to IP. The committee had studied in depth IP policies of various HEIs within India and overseas. Continuous and thorough deliberations on various aspects of IP, practical experiences of the concerned stakeholders, opinion from IP experts helped to develop the IP policy of the HEI. Again to note here, the HEI appreciated the dynamics of IP system and amended the IP policy in the year 2012.

4.3 HEI IP policy and Key drivers

At the HEI, the key centers for IP policy development and implementation are the Industrial Research and Consultancy Center (IRCC), IPR chair and Society for Innovation and Entrepreneurship (SINE) which are the key drivers to push innovation and entrepreneurship.

4.3.1 IRCC

IRCC handles issues related to the activities, policies and initiatives for facilitating R&D and incentivizing researchers of the HEI. The few initiatives can be listed as research paper awards and research fellowship scheme, coordination of new research directions / initiatives, seed grant and special grants, patenting and marketing of inventions, central facilities and advanced research facilities, providing advance for sanctioned projects and so on.

4.3.2 SINE

The HEI was an early adopter of the concept of business incubation in India. Thus, SINE came into

existence in 2004 to administer the business incubator and accelerate the growth of entrepreneurship at the HEI. Since then it has served as a role model for other business incubators in academia across the country. The Department of Science and Technology of the Government of India has also provided financial assistance to the business incubator. The incubator, with infrastructure spread over 10000 sq.ft., can accommodate about 15-17 companies. The main activities at SINE are to incubate early stage entrepreneurial ventures based on technology and innovation, to create physical infrastructure and support systems, to facilitate networking with professional resources, to identify technologies/innovations which have potential for commercial ventures to promote and foster the spirit of entrepreneurship and so on. More than 25 incubatees are breeding at the institute and competing in the respective industry.

4.3.3 IPR Chair

The Ministry of Human Resource Development under the scheme of IP education, research and public outreach (IPERPO) has set up IPR Chair at the HEI considering the potential for development and growth of IPR education, research and training. IPR chair at the HEI is very active and performs various activities throughout the year for IP development as IP educational activities through fundamental and advanced workshop and IP clinic, curricular activities as running PG Level, 3 credit courses as "management of IPR", and "new business models in knowledge economy", and Ph.D. Level 6 credit course as "foundation of IPR". Various research activities as research confluences dedicated to IPR and international conferences fully dedicated to IPR are conducted every year. At the orientation programme at HEI, all new entrances are provided with special awareness training on IPR.

These types of activities create the encouraging environment within the HEI and help to boost the IP activity which is reflected in the IP output and is shared in table 1.1.

4.4 IP policy of the HEI: Broad outline

IP policy of the HEI covers all critical points related to innovation, entrepreneurship and IP through IP policy which is structured broadly into five parts addressing various issues related to ownership, revenue sharing, licensing, technology transfer, and so on as follows.

Part A: IP Policy Preamble

Part B: The Intellectual Property (IP) Policy

I. Ownership

II. Disclosure

III. IP Licensing and Agreements

Licensing Types

- License Exemptions:

IV. Technology License / Transfer Options

V. Infringements, Damages, Liability and Indemnity Insurance

VI. Conflict of Interest

VII. Disput e Resolut ion

VIII. Jur isdict ion

Part C: The Inventions related IP Policy

1. Applicability & Requirements
2. Relevant inventions and Ownership
3. Ownership exemption
4. External Funded / Collaborative Development
5. Design Rights
6. Trade Mark(s) / Service Mark(s)
7. Material Transfer Agreements (MTAs)

Part D: The Expressions related IP Policy

1. Applicability & Requirements
2. Relevant creations and ownership
3. Ownership exemptions
   - Teaching / Course material
   - Continuing Engineering Programme (CEP) Courses

- Quality Improvement Programme (QIP) Courses
- Centre for Distance Engineering Education Programme (CDEEP) Courses
- Thesis
- Books, articles and related literary works

Part E: Annexure

Annexure 1 - Defining parties concerned and significant usage

Annexure 2 - Disclosure, Assessment and Protection

Annexure 3 - Revenue Sharing

Annexure 4 - Role of Industrial Research and Consultancy Centre

Annexure 5 - Contracts and Agreements

4.5 HEI IP policy Highlights

The IP policy of HEI addressed various issues related to innovation, IP and entrepreneurship development. One of the important and critical facts considering innovation and entrepreneurship development is protection of start-ups from competitive world at initial phase and make them competent enough to handle the competitive market in defined time at later stage of the development. Thus incubator is the transition phase between 'start up organisation' and 'globally active competitive organization'.

All these aspects are successfully handled by HEI through IP policy. IP policy of the institute created cosy, insulating, and encouraging environment for the start ups by providing financial subsidization on initial set up facilities, encouraging IP development through incentivisation and very competitive revenue sharing model. Thus the IP policy guidelines of the HEI stroked the balance between promotions of entrepreneurship through protective environment at the same time avoided isolation of start up from competitive world. This precaution is taken by HEI as the isolation of start up may kill the start up in future due to incapability to handle the competition. Private equity sharing is also encouraged for the financial support to entrepreneurship.

Detailed IP policy link of the HEI is shared in references. The highlights of IP policy of HEI under study are as

- Special emphasis is given on research and development at the HEI. It is believed that R&D is the key factor which results in new and novel outputs as products, processes, know-how, technologies, software which can be developed during academic research, collaborative R&D with industry / organisations.
- The HEI expects students to get initiated into research activities early on.
- Industrial research and consultancy centre (IRCC) and Society for Innovation and Entrepreneurship (SINE) are the two key bodies which drive innovation and entrepreneurship at the HEI.
- Commercialisation of technologies is achieved through IP protection as per policy guidelines and then – incubation, spin offs, license / transfer to industry, and so on.
- IP policy of the HEI is creating conducive and encouraging environment by providing IP protection facilities, IP commercialization facilities, adequate infrastructural facilities, incentives and appreciation (through awards systems, ownership and revenue sharing) for innovators or stakeholders (authors, scientists, technologists, student, …)
- IPMS at the HEI is developed and initiated proactive role to identify potential IP generated by stakeholders.
- Establishment of IPR cell and IPR chair at HEI are very active for IP awareness within the HEI through various IP related activities as seminars, fundamental and advanced workshops, IP clinics etc.
- Ownership transfer to creator if he develops IP without intellectual contribution of IITB personnel or significant use of IITB resources.

- The HEI does not claim ownership of copyright on books and publications authored by IITB personnel.
- Transfer of ownership rights to the creator if the HEI is not able to commercialize the IP in a reasonable time.
- The revenue sharing is very competitive as for first amount of X: Inventor70% and the HEI 30%, for next amount of X: inventor: 50% the HEI: 50% and for amounts more than X: inventor 30% and the HEI:70%

4.6 IP outcome before and after IP policy development

For sustainable entrepreneurship development, continuous innovation process is needed. In the competitive business environment, innovation that is idea generation to development of final product or process, its proper protection through IP regimes and commercialization of the final product or process to generate revenue that the process from IC involvement to FC development must run swiftly. This can be achieved by IP policy guidelines. Table 1.1 shares the details about the R & D outputs before and after the IP policy development and implementation. Figure 1.4 shares the growth of Indian patent applications filed by the HEI.

Table 1.1 IP output before and after IP policy (Source: HEI- Annual Report FY 2012-13 and Arumugam and Jain, 2013)

	2002-03	2003-12	2012-13
	Before IP policy	After IP policy	After revised IP policy
Number of IP (patent/design/ trademark) applications filed in India and abroad	11	295	94
Number of patent/design/ trademark granted	3	90	15
Number of IP commercialized	nil	95	11
License money generated (in Rs Lakhs)	nil	209.42	1120

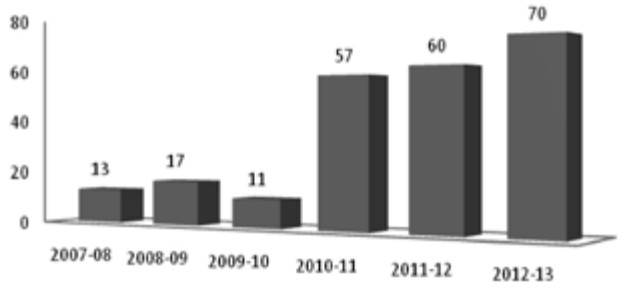

Figure 1.4: Growth of Indian Patent Applications filed by the HEI (Source: HEI- Annual Report FY 2012-13, Arumugam and Jain, 2013)

5. DISCUSSION

Considering today's scenario of IP and its management at global level, it is becoming mandatory for HEIs to change their focus from knowledge sharing to knowledge capitalization. Efficient IPM practices facilitate conversion of knowledge to capital. One of the important steps in innovation and entrepreneurship development is to sustain in the competitive environment. Continuous innovation, generation of IP will help sustainable entrepreneurship development. Well documented guidelines in the form of IP policy document and its implementation in the system will help the HEI to develop conducive environment which will help to develop entrepreneurship through innovation. The process is slow but is promising step to survive in the global competition and to serve the nation by creating wealth.

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