

# Intellectual Property Monetization by R&D Institutions in India and China

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## Abstract

*The forces of globalization and competitiveness have led to an increased focus on IP monetization for R&D organizations in India and China. The paper analyses the activities related to commercialization of IP undertaken by such institutes. IP monetization is recommended for attaining higher growth, increased revenues and self-sustenance. Insights have been drawn from companies and successful R&D establishments across the globe. Capabilities need to be built on the aspects of technology landscape analysis, market potential estimation, valuation and pricing of IP, and commercialization of IP. Appropriate models have been proposed for developing such capabilities for deriving value from IP developed by the R&D organizations.*

## INTRODUCTION

Innovation is a key driver for achieving sustainability in business and trade, in today's global economy. The rapid progress made in China and India in recent years indicates the importance of viewing the world, in its entirety, as a market. Sustainable development needs have resulted in an increased awareness of the creation, protection and monetization of intellectual assets such as patents, copyrights, and trademarks. With the increasing focus on technology, Research and Development (R&D) has gained priority as a business function. The complexities of global competitiveness have brought in its wake an increased focus on R&D, and the recouping of R&D costs, by extensive monetization of intellectual property (IP), products and services. In the current economic scenario, R&D organizations need to focus on their R&D and match market estimations and projections, to be successful. R&D organizations need to view monetization of IP as an important aspect, crucial for attaining self-sustenance and relieving them from a dependence on government-funding.

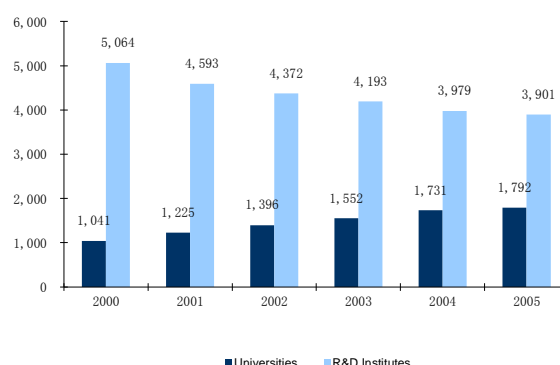
## Keywords

Intellectual property, R&D, Monetization, Institutions, India, China

## R&D IN CHINA AND INDIA

China and India have experienced rapid economic growth in recent years. The liberalization of these economies has brought about a sea change in the political, socio-economical and the technological ecosystem in these countries. The rapid growth of the Chinese and Indian economy has driven funding of R&D organizations, including that of universities and government-funded R&D institutes.

In 2005, the number of universities in China reached 1,792, which was a 72 percent increase over 2000. Among these universities, 40 percent have R&D capacity [1]. The number of R&D institutes shrank from 5,064 in 2000 to 3,901 in 2005, which amounted to a 23 percent decrease in their number. However, other factors related to the R&D capacity of the institutes improved: funds obtained in 2005 amounted to CNY 95 billion (a 70 percent increase over 2000), and the number of R&D scientists and engineers reached 0.17 million in 2005 (a 12 percent increase over 2000).



**Figure 1 - Number of Universities and R&D Institutes in China (2000 to 2005) [2]**

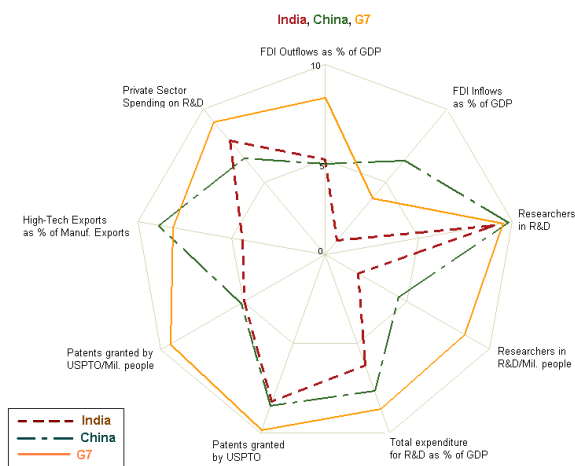
India has a significant number of diversified government-funded R&D institutions, as well as world-class institutions of higher learning that provide human capital [3]. There are around 200 national laboratories and over 1300 R&D bodies in the industrial sector in the country [4]. India also produces a critical mass of scien-

tists, engineers and technicians, who are highly qualified in R&D.

In both China and India, basic research, with an academic perspective, is predominant at universities and academic centres. Applied research is the focus of government-funded organizations, where monetization of IP is of paramount importance.

## STATUS QUO

While both China and India abound in diversified government-funded R&D institutes, the number of researchers continues to be a small fraction of the population of these countries (Figure 2). Figure 2 indicates that China and India's performance is average in the number of patents granted by the USPTO per million of population, researchers in R&D per million of the population, and the total expenditure on R&D as a percentage of GDP. Figure 2 places China, India and the G7 (UK, US, Canada, France, Germany, Italy and Japan) countries on the same plane.

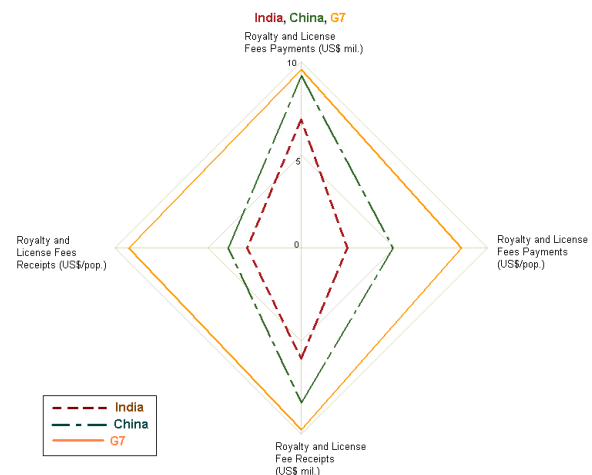


**Figure 2 – Performance of China, India and G7 countries on Innovation [5]**

On closer study, it has been observed that China is definitely ahead of India in the areas of researchers in R&D, total expenditure on R&D, FDI inflows as a percentage of GDP, as well as the number of researchers engaged in R&D per million of the country's population. With a push from the Chinese government and an increasing awareness of the importance of IP, the enhanced R&D capacity of organizations was also reflected in an increase in the number of patent applications filed. In 2005, the number of patents filed by universities and research institutes reached 29,667, accounting for 18.67 percent of domestic service applications in China, which was a 41 percent increase over 2000. In the case of India, the patent portfolio of 38 government-funded laboratories of the Council of Scientific and Industrial Research (CSIR) has increased from less than 30 US patents in 1995 to more than 720 patents in July 2006 [6].

China and India, however, have some distance to cover with respect to the G7 countries as far as monetization of IP is concerned. As seen in Figure 3, China and India are lagging behind in royalty and license fee receipts, on an absolute as well as a per person basis.

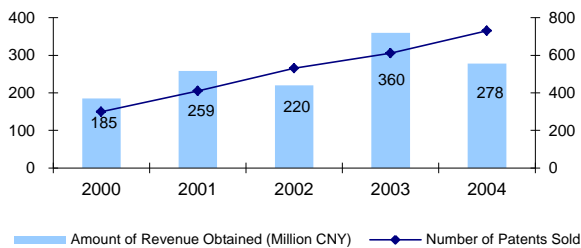
China and India, on the other hand, have some distance to cover with respect to the G7 countries, as far as monetization of IP is concerned. As seen from Figure 3, China and India are behind in Royalty and License Fee Receipts, both as an absolute as well as per person.



**Figure 3 – Performance of China and India on Royalty and License Fees [5]**

Both China and India have set up routes through which universities and research institutes can monetize their IP. These include establishing Technology Incubation Centres in universities such as those established at IIT Bombay and BITS Pilani in India, as well as at the Tsinghua University and the Peking University High-tech Corporation in China; setting up joint ventures with industrial units, such as research projects operated by the Tsinghua University with the State Science Ministry and Education Commission, and the sale, licensing and industrialization of patents. The CSIR, in India, has set up twin routes for the monetization of IP developed by its laboratories. These laboratories monetize IP either through in-house business development groups or through the National Research Development Corporation (NRDC). The NRDC can claim numerous commercialization deals to its credit, which relate to agro food, bio-medical devices, drugs and pharmaceuticals, chemicals, electronics, building materials and biotechnology [7].

As with innovation, it has been observed that monetization of IP, patents in particular, is a more proactive force in China than in India. Figure 4 details the revenue obtained from the sale of patents and the number of patents sold in China over a five-year time span.



**Figure 4 – Monetization of Patents – China [8]**

India's leading R&D organization, the CSIR, has licensed 133 patents of the 1915 patents filed worldwide [6]. This indicates a wide gap between protection and monetization of IP in the country.

## IP MONETIZATION

While both China and India have well-established IP law and policies, efficient IP management is the need of the hour. Processes need to be set up in government-funded R&D institutes that help organizations monetize their IP and derive a competitive advantage and sustainability. Clearly, moving ideas from the laboratory to the marketplace needs deliberation; some models have been proposed for the same. The life cycle of an intellectual asset can be summarized as follows – R&D, IP protection, commercial assessment, marketing of technology and IP, licensing, collection of royalty, and maintenance of IP. Further, the conservation of IP information is necessary for IP monetization activities.

*Technology landscape analysis:* Prior to investing in R&D, a technology landscape analysis can be carried out, wherein patenting trends in the technology under consideration can be observed. An analysis of the patents filed in the technology may reveal the gaps in the domain, which may be exploited. Such a need-gap analysis, combined with market estimation, may provide an accurate picture of the worth of an investment, the expected returns, etc.

*IP valuation:* Monetization of IP requires a detailed market analysis followed by the estimation of the value of the IP. The market analysis is utilized for estimating the revenues attributable to the IP which is being considered for monetization. The value may be estimated by developing a discounted cash flow (DCF) model, based on the income approach of patent valuation. The value of the patent is helpful in determining the price for the sale of IP. In the licensing scenario, royalties may also be estimated by utilizing the DCF model. The estimated value of the IP and the estimated royalties may be refined by utilizing a Monte Carlo simulation-based patent valuation model which accounts for the variation in parameters, e.g., market size, growth rate, marketing expenses.

*Business development groups:* It is proposed that government-funded R&D institutes interface with business development groups that are solely responsible for monetization of IP. These groups exist in China and India and are composed of senior scientists [9]. The business development group should ideally include scientists, as well as individuals with a background in marketing, advertising and promotion, and IP. The business development groups may be responsible for allocating budgets to the institutes; analyzing inventions and the feasibility of commercialization; promoting and marketing technology relating to the industry, technology transfer, patent licensing and royalty receipts; and maintaining client relationships.

## CONCLUSION

Globalization, in the business context, has transformed all such organizations. There has been an explosion of opportunities, which these organizations must try to exploit. International trade has become a vital aspect for fuelling the growth of economies. Both China and India are emerging as global players in innovation and competitiveness.

Chinese R&D institutions have been quick to realize the importance of R&D and innovation, secured by IP rights. Indian institutions need to ramp up their R&D initiatives, as compared to China, and increase awareness of IP rights in universities and R&D organizations. However, as mentioned earlier, China and India both lag behind countries such as the member countries of the G7 that have adopted monetization as a business need. R&D institutes in China and India need to view IP and its monetization from a commercial perspective, for improved innovation and sustainability in the global marketplace. Assessment methodologies such as Technology Landscape Analysis, as well as commercialization potential assessment, need to be incorporated into the processes of these institutes. Further, business development groups need to be established that will be responsible for the monetization of IP from such institutes. These groups should be a mix of scientists and individuals with a background in marketing and the domain, who will facilitate the creation of a market-driven vision and value proposition.

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